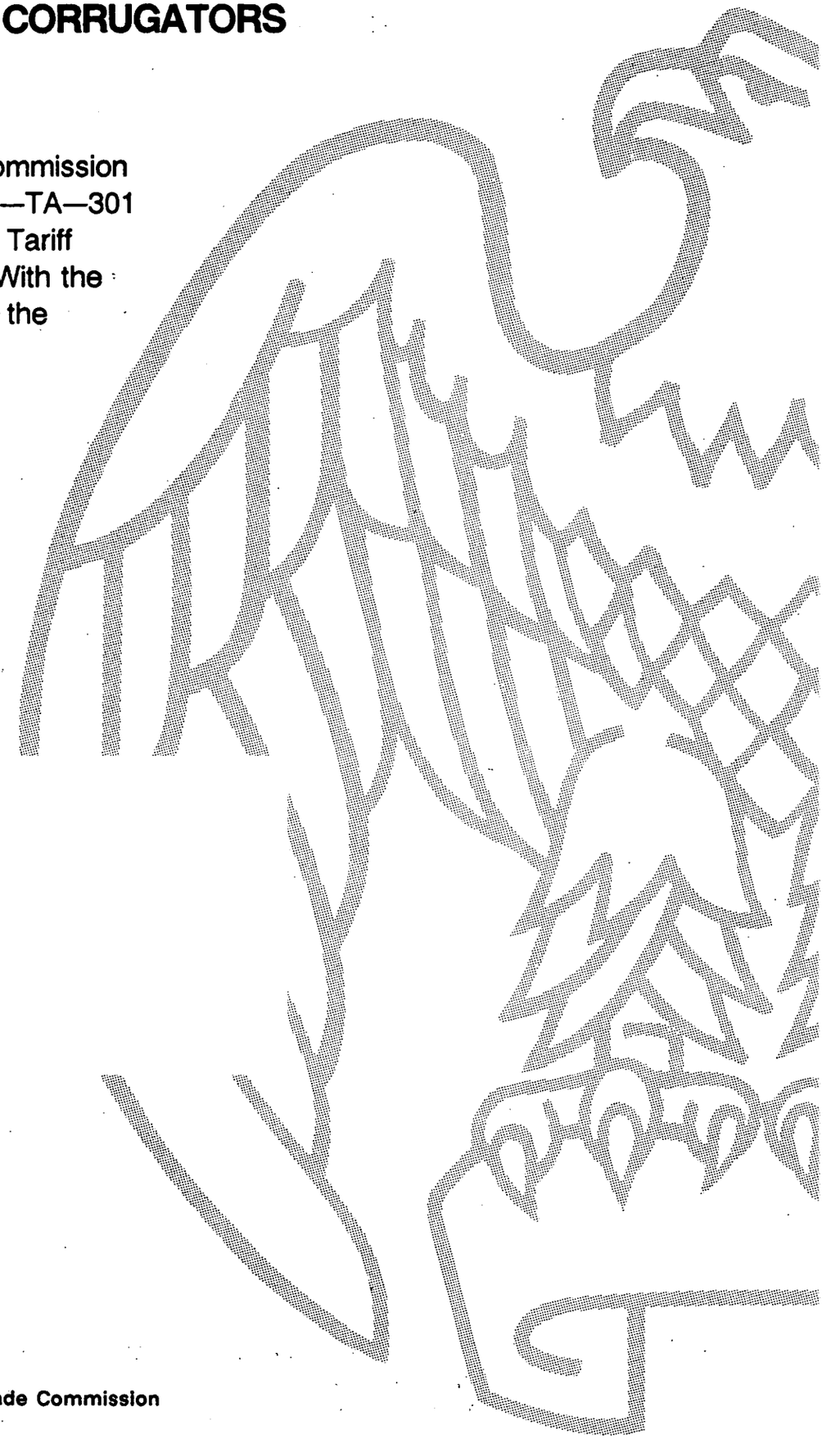
PLASTIC TUBING CORRUGATORS FROM CANADA

Determination of the Commission in Investigation No. 701—TA—301 (Preliminary) Under the Tariff Act of 1930, Together With the Information Obtained in the Investigation



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UNITED STATES INTERNATIONAL TRADE COMMISSION

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Note.--Information that would reveal business proprietary operations of individual concerns may not be published and therefore has been deleted from this report. Such deletions are indicated by asterisks.

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, DC

Investigation No. 701-TA-301 (Preliminary)

PLASTIC TUBING CORRUGATORS FROM CANADA

Determination

On the basis of the record [1] developed in the subject investigation, the Commission determines, [2] pursuant to section 703(a) of the Tariff Act of 1930 (19 U.S.C. 1671b(a)), that there is no reasonable indication that an industry in the United States is materially injured, or is threatened with material injury, or the establishment of an industry in the United States is materially retarded, by reason of imports from Canada of plastic tubing corrugators, provided for in subheadings 8477.30.00 and 8477.40.00 of the Harmonized Tariff Schedule of the United States (formerly provided for in items 678.3535 and 678.3545 of the Tariff Schedules of the United States), that are alleged to be subsidized by the Government of Canada.

Background

On November 7, 1989, a petition was filed with the Commission and the Department of Commerce by Cullom Machine Tool & Die, Inc.. Cleveland, TN, alleging that an industry in the United States is materially injured by reason of subsidized imports of plastic tubing corrugators and apparatus therefor from Canada. Accordingly, effective November 7, 1989, the Commission instituted preliminary countervailing duty investigation No. 701-TA-301 (Preliminary).

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[1] The record is defined in sec. 207.2(h) of the Commission's Rules of Practice and Procedure (19 CFR 207.2(h)).

[2] Chairman Brunsdale and Vice Chairman Cass dissenting.

Notice of the institution of the Commission's investigation and of a public conference to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the Federal Register of November 15, 1989 (54 F.R. 47583). The conference was held in Washington, DC, on November 28, 1989, and all persons who requested the opportunity were permitted to appear in person or by counsel.

VIEWS OF COMMISSIONER ECKES, COMMISSIONER LODWICK, COMMISSIONER ROHR, AND COMMISSIONER NEWQUIST

On the basis of the record in this preliminary investigation, we determine that there is no reasonable indication that the domestic industry producing plastic tubing corrugators is materially injured or threatened with material injury by reason of allegedly subsidized imports from Canada. 1/ In keeping with the standard for determinations in preliminary investigations as set forth in American Lamb Co. v. United States, 2/ we find that (1) the record as a whole contains clear and convincing evidence that there is no material injury or threat of such injury by reason of the subject imports; and (2) no likelihood exists that contrary evidence will arise in a final investigation.

I. Like Product/Domestic Industry 3/

To determine whether there is a "reasonable indication of material injury," the Commission must make threshold factual determinations with respect to the appropriate "like product" and "domestic industry." Section 771(4)(A) of the Tariff Act of 1930 defines, in pertinent part, the relevant domestic industry as the "domestic producers as a whole of a like product, or those producers whose collective output of the like product constitutes a major proportion of the total domestic production of that

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1/ Material retardation of the establishment of an industry is not an issue in this investigation and will not be discussed further.

2/ 785 F.2d 994 (Fed. Cir. 1986).

3/ Chairman Brunsdale and Vice Chairman Cass join in this discussion of like product/domestic industry. See their Additional Views for discussion of their affirmative determinations.

product." 4/ "Like product" is defined as "a product which is like, or in the absence of like, most similar in characteristics and uses with, the article subject to an investigation." 5/

4/ 19 U.S.C. § 1677(4)(A).

5/ Id. § 1677(10). The Commission's decision regarding the appropriate like product(s) in an investigation is a factual determination, and the Commission has applied the statutory standard of "like" or "most similar in characteristics and uses" on a case-by-case basis. Asociacion Columbiana de Exportadores de Flores v. United States, 12 CIT --, 693 F. Supp. 1165, 1169 & n.5 (1988) (ASOCOLFLORES); Sweaters Wholly or in Chief Weight of Manmade Fibers from Hong Kong, the Republic of Korea, and Taiwan, Inv. No. 731-TA-448-450 (Preliminary), USITC Pub. No. 2234, at 4 (Nov. 1989) (Sweaters); Digital Readout Systems and Subassemblies Thereof from Japan, Inv. No. 731-TA-390 (Final), USITC Pub. No. 2150, at 3-4 (Jan. 1989).

The factors involved in this determination include (1) physical characteristics, (2) end uses, (3) interchangeability of the products, (4) channels of distribution, (5) production processes, (6) customer or producer perceptions, (7) common manufacturing facilities and production employees, and (8) price. See, e.g., ASOCOLFLORES at 1170 n.8; Digital Readout Systems at 4; Sweaters at 4; Certain All-Terrain Vehicles from Japan, Inv. No. 731-TA-388 (Final), USITC Pub. No. 2163, at 4 (Mar. 1989); Dry Aluminum Sulfate from Sweden, Inv. No. 731-TA-430 (Preliminary), USITC Pub. No. 2174, at 4 (Mar. 1989); Light-Duty Integrated Hydrostatic Transmissions and Subassemblies Thereof, With or Without Attached Axles, from Japan, Inv. No. 731-TA-425 (Preliminary), USITC Pub. No. 2149, at 5 (Jan. 1989) (Hydrostatic Transmissions). However, the Commission has previously found that minor product variations are not sufficient to find separate like products. Rather, it seeks clear dividing lines among products. See, e.g., Sweaters at 4-5; Antifriction Bearings (Other than Tapered Roller Bearings) and Parts Thereof from the Federal Republic of Germany, France, Italy, Japan, Romania, Singapore, Sweden, Thailand, and the United Kingdom, Invs. Nos. 303-TA-19 and 20, 731-TA-391-399 (Final), USITC Pub. No. 2185, at 11 (May 1989); Digital Readout Systems at 4; Operators for Jalousie and Awning Windows from El Salvador, Invs. Nos. 701-TA-272 and 731-TA-319 (Final), USITC Pub. No. 1934, at 4 n.4 (Jan. 1987).

When considering whether "semifinished" or "component" articles are "like" the finished product, the Commission examines: (1) the necessity for, and the costs of, further processing; (2) the degree of interchangeability of articles at the different stages of production; (3) whether the article at the earlier stage of production is dedicated to use in the finished article; (4) whether there are significant independent uses or markets for the finished and unfinished articles; and (5) whether the article at an earlier stage of production embodies or imparts to the finished article an essential characteristic or function. Certain Telephone Systems and Subassemblies Thereof from Japan, Korea, and Taiwan, Inv. No. 731-TA-426-428 (Preliminary), USITC Pub. No. 2156, at 4-5 (Feb. 1989); Hydrostatic Transmissions at 19 n.64.

In its notice of investigation, the Department of Commerce stated that the scope of the investigation is "plastic tubing corrugators" (PTCs), which it defined as:

> all machines and apparatus therefor (including mold sets, dies, and perforators, but excluding separately imported and/or free-standing extrusion machines) designed to manufacture continuous lengths of corrugated plastic tubing whether such machines and apparatus are imported as part of the systems or separately. These goods are described for tariff classification purposes as blow molding machines and vacuum molding machines and other thermoforming machines, all the foregoing used for working rubber or plastics or for the manufacture of products from these materials. 6/

PTCs are machines consisting of a track or tracks of molds, running gear to operate the track(s), a die to inject plastic into the molds, a cooling system, a built-in electric power source, a control panel, and an optional perforator. The die injects preheated plastic into individual molds. The molds form and cool the tubing as the molds move through the machine and then release the tubing at the end. A perforator at the end of the machine can place evenly spaced slits in the tubing. The finished tubing is used as hoses and ducts for buildings, appliances, automobiles, and other machinery; insulation and housing for pipe, wiring and electrical cables; and conduits and culverts for sewage, land drainage and farm irrigation. 7/

Both petitioner and respondent produce corrugators in different sizes. Each size is limited to the size of the molds it can accommodate and thus the range of sizes of plastic tubing it can produce. The basic design and operational features of a PTC, as well as of the mold sets, dies, perforators and other components, are specific to the manufacturer and vary

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6/ 54 Fed Reg. 50,263, 50,264 (1989).

7/ Report at A-2.

considerably from producer to producer. Because different makes of corrugators can differ in detail as well as basic design, very few parts, if any, are interchangeable. 8/

Petitioner proposes that the like product be defined as all PTCs, including mold sets, dies and perforators. 9/ Respondent states that it is "content" with this definition, although it suggests that the definition could be narrowed to vacuum molding PTCs, 10/ which is the only type petitioner manufactures. 11/ Respondent also suggests that separate like products could logically be identified according to uses, such as PTCs used to manufacture tubing for drainage and appliance applications versus PTCs for specialty applications such as the medical field. 12/ As discussed below, we find that there is one like product, which consists of all PTCs, including mold sets, dies and perforators, corresponding to the subject imports from Canada. 13/

Customers purchase PTCs, which have been manufactured to their particular specifications, directly from the producer. 14/ PTCs vary in

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8/ Id. at A-3.

9/ Petition at 10.

10/ Post-Conference Brief of Respondent at 6, 7 n.4.

11/ Tr. at 59-60 (Mr. Dickhut). Petitioner does note, however, that it has the capability of manufacturing any type of corrugator. Id.

12/ Post-Conference Brief of Respondent at 7 n.4.

13/ We do not include extruders in the like product. The Department of Commerce excluded from the scope of its investigation all types of extruders that are known to be imported. 54 Fed. Reg. at 50,264. No party has argued for inclusion of extruders in the like product, and we see nothing in the record of this preliminary investigation to warrant their inclusion.

14/ Report at A-17.

size, options such as perforators, and various operational details. However, the record does not indicate that either customers or producers view PTCs in terms that would clearly separate them one from the other. 15/

Petitioner maintains that vacuum molding machines, which are the only type it manufactures at present, 16/ are superior in quality to blow molding machines. 17/ Because vacuum systems have a high output and fast speed, they produce more feet of tubing per minute, 18/ but petitioner still argues that vacuum molding and blow molding machines should be part of the same like product. 19/

We understand that either type of PTC can be used to manufacture all types of plastic tubing. 20/ The record shows that, on the basis of the type of technology, some customers prefer the respondent's blow molding PTCs to petitioner's vacuum molding machines and vice versa. 21/ As petitioner notes, both types of PTC share the same essential

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15/ In Certain Bimetallic Cylinders from Japan, Inv. No. 731-TA-383 (Final), USITC Pub. No. 2080 (May 1988), the Commission found a single like product although each item was essentially custom-made. Id. at 4.

16/ Tr. at 60 (Mr. Dickhut).

17/ Id. at 59-60 (Mr. Dickhut).

18/ Post-Conference Brief of Petitioner at 8.

19/ Petition at 12.

20/ Tr. at 36 (Mr. Lupke).

21/ Report at A-21 - A-22.

characteristics and uses. 22/ Similarly, although PTCs for different applications vary in size and details, this is true for all PTCs. 23/

In light of the foregoing, we find one like product consisting of all PTCs. We base this finding primarily on the similar characteristics and end uses of the corrugators, and the common manufacturing facilities and employees used in the production of these machines. 24/

PTC subassemblies, i.e., the die, perforator and mold set(s), can account for 50 percent or more of the value of the PTC, depending on the number of mold sets purchased. 25/ In theory any machine shop could produce these items to order, but this rarely, if at all, occurs in practice. 26/ While very few parts of a PTC, if any, are interchangeable, some PTC manufacturers make and sell certain quantities of components, especially mold sets, for makes of corrugators other than their own. 27/

22/ See Petition at 10, 12.

23/ In Mechanical Transfer Presses from Japan, Inv. No. 731-TA-429 (Preliminary), USITC Pub. No. 2160, at 8 (Feb. 1989), the Commission did not find a clear dividing line among mechanical transfer presses based upon their physical characteristics, despite the fact that each press is built to a customer's specifications. Id. at 7.

24/ The fact that two domestic firms other than petitioner generally produce machines which are not as productive as petitioner's machine and are more specialized due to the less demanding and/or more esoteric needs of that buyer, see Report at A-5, does not preclude including these machines within a single like product definition. The record suggests that these PTCs share the same essential characteristics and uses as other PTCs.

25/ Id. at A-2.

26/ Report at A-5.

27/ Id. at A-2, A-5. During the first three years of operation, petitioner's PTCs were equipped with dies supplied by another manufacturer. Since 1984, however, petitioner has made all of its own dies. Post-Conference Brief of Petitioner at 11. In addition, petitioner states that it has recently quoted wear plates and mold chain to one of respondent's customers. Id. at 12.

Although neither party to this investigation has suggested that subassemblies should be considered separate like products, the significance of these subassemblies to the PTC as a whole suggests the need to consider the question.

Basic mold sets require the addition of other components to be able to manufacture plastic tubing. They would require a cooling system, a built-in electric power source and a control panel in order to perform the functions of a PTC. 28/ Mold sets are not interchangeable with the PTC or with each other. However, PTCs themselves are custom-made to order, and are not themselves interchangeable. We note that in several investigations involving subassemblies or components, we have found a single like product, notwithstanding the absence of interchangeability. 29/

Mold sets are dedicated solely for use in the finished product. This factor favors their inclusion in the like product. 30/ Even though mold sets are often sold separately from PTCs, their sales are entirely dependent on sales of PTCs. Mold sets are complementary products and the demand for them is derived from the demand for PTCs. 31/

28/ See Report at A-2.

29/ See, e.g., Telephone Systems at 14; Antifriction Bearings at 21-22; 64K Dynamic Random Access Memory Components from Japan, Inv. No. 731-TA-270 (Final), USITC Pub. No. 1862, at 10 (June 1986); Erasable Programmable Read Only Memories from Japan, Inv. No. 731-TA-288 (Final), USITC Pub. No. 1927, at 10 (Dec. 1986).

30/ Telephone Systems at 14.

31/ This is not to suggest that mold sets are not sold separately. They frequently are sold separately as add-on components. See Report at A-4. However, these items are and can only be sold to customers who already have PTCs. The items have no use other than in PTCs.

The analysis for dies and perforators is analogous to that for mold sets. Dies add substantially to the price of the PTC and are generally regarded as a fundamental part. While dies may be purchased separately from PTCs, such dies will likely cause the PTC to function at less than its peak. 32/ Perforators are not used in every PTC application, but are fully dedicated to use in PTCs. 33/

While no component imparts the essential characteristic to a PTC (indeed, there is no single essential characteristic to a PTC but, rather, a collection of characteristics), each component is essential to the operation of a PTC. 34/ Accordingly, based upon the record in this preliminary investigation, we find that all PTCs, along with mold sets, dies and perforators, form one like product. We further determine that there is one domestic industry consisting of the producers of the like product.

II. Condition of the Domestic Industry 35/

In considering the condition of the domestic industry, the Commission examines, among other factors, domestic consumption, domestic production, capacity, capacity utilization, shipments, inventories, employment, and

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32/ Petition at 11.

33/ See id.

34/ Telephone Systems at 15.

35/ Because there is only one domestic producer of PTCs in this investigation, much of the specific data on the condition of the industry are confidential. Thus, we will discuss the condition of the domestic industry producing corrugators in only the most general terms.

profitability. 36/ In addition, 19 U.S.C. § 1677(7)(C)(iii) requires the Commission to consider the condition of the industry in the context of the business cycle and conditions of competition that are distinctive to the domestic industry. 37/

Domestic consumption by value of PTCs and apparatus therefor combined declined during the period of investigation, and declined from interim 1988 (January to September) to interim 1989. 38/

Because PTCs and parts are produced to order, there are no inventories. 39/ Consequently, the number of corrugators shipped is equivalent to the number produced. 40/ The volume of corrugators shipped increased from 1986 to 1988, 41/ but overall the total value of domestic shipments of corrugators and apparatus therefor declined from 1986 to 1988. However, shipment value increased from interim 1988 to interim 1989 due to a large increase in aftermarket sales of mold sets and dies. 42/

Any consideration of the capacity of a firm to produce corrugators must take into account the fact that the amount of time required to produce a PTC can vary from three months to a year and more, depending on the size and complexity of the machine ordered and the kind and amount of

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36/ See 19 U.S.C. § 1677(7)(C)(iii).

37/ See H.R. Rep. No. 317, 96th Cong., 1st Sess. 46 (1979); S. Rep. No. 249, 96th Cong., 1st Sess. 88 (1979).

38/ Report at A-14 - A-15 and A-16, Table 9.

39/ Id. at A-7.

40/ Id. at A-6.

41/ Id. at A-7, Table 1.

42/ Id. at A-7.

accessories included. 43/ Petitioner provided an estimate of its practical capacity, but this is a very approximate figure. 44/ However, petitioner has never approached full use of its reported capacity since it began production in 1980. 45/ Its capacity utilization increased from 1986 to 1988 before declining from interim 1988 to interim 1989. 46/

The average number of all production and related workers in petitioner's plant increased steadily from 1986 to 1988 and fell very slightly from interim 1988 to interim 1989. 47/ The number of hours worked showed a similar pattern, while hourly compensation and total compensation increased throughout the period of investigation. 48/

General financial trends for the domestic industry were mixed throughout the period of investigation. 49/ Though net sales showed steady growth, operating income has been low but is improving. 50/

43/ Id. at A-6.

44/ Id.

45/ See id. at A-7, Table 1.

46/ Id. at A-6.

47/ Id. at A-8, Table 2. Workers' time in U.S. producers' plants may be allocated to tasks unrelated to the production of corrugators and apparatus therefor. Data from domestic producers other than petitioner show that the share of their workers' time for the production of the subject products is small, in stark contrast to the share of petitioner's workers' time. Id. at A-7.

48/ Id. at A-7 and A-8, Table 2.

49/ Financial data provided were for overall establishment operations only. Petitioner does not maintain separate product cost records for PTCs and/or related apparatus. In addition, the data are for the company's fiscal year, i.e. from June 1st of one year to June 30th of the next. Id. at A-8. The record suggests that the domestic industry's profitability may be higher than the figures reported. See id.

50/ Id. at A-8 - A-9 and Table 3, and A-10, Table 4.

We conclude based on the record, and particularly on such factors as low profitability and declines in shipments, that there is a reasonable indication that the domestic industry is experiencing material injury.

III. No Reasonable Indication of Material Injury by Reason of Allegedly Subsidized Imports from Canada

In determining whether there is a reasonable indication that the domestic industry is materially injured by reason of alleged subsidized imports, the Commission is required to consider a number of factors. They include the volume of imports of the merchandise subject to investigation, the effect of such imports on domestic prices and the impact of such imports on the domestic industry. 51/ Evaluation of these factors involves a consideration of (1) whether the volume of imports or increase in volume is significant, (2) whether there has been significant price underselling by the imported products and (3) whether imports have otherwise depressed prices to a significant degree or prevented price increases. 52/

The Commission is not to weigh the various causes of material injury. 53/ However, it should take into account any information demonstrating possible alternative causes of injury to the domestic

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51/ 19 U.S.C. § 1677(7)(B).

52/ Id. § 1677(7)(C).

53/ See, e.g., Citrosuco Paulista, S.A. v. United States, 12 CIT --, 704 F. Supp. 1075, 1101 (1988); Hercules, Inc. v. United States, 11 CIT --, 673 F. Supp. 454, 480 (1987); British Steel Corp. v. United States, 8 CIT 86, 593 F. Supp. 405, 413 (1984).

industry, 54/ and determine whether the subject imports contribute to material injury. 55/

Imports of PTCs from Canada (all produced by the respondent) declined both in quantity and value throughout the period of investigation. The value of imports of mold sets, dies and perforators, which also were primarily manufactured by respondent, did increase from interim 1988 to interim 1989. However, there was a large decline in the value of apparatus imports during 1986 to 1988. The value of imports of all products declined significantly throughout the investigation period. 56/

In terms of value, 57/ imports of PTCs and apparatus therefor from Canada maintained a relatively stable share of the U.S. market during the first three years under investigation, then declined sharply from interim 1988 to interim 1989. 58/

PTCs are sold on a per unit basis and are priced according to the specific machine model. They are usually made according to individual customer specifications which may vary widely from machine to machine. The

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54/ See S. Rep. No. 249, at 58. Some of the possible explanations for the decline in new corrugator sales may be the increasing productivity and adaptability of corrugators, a large stock of European machines purchased prior to 1986 which are still in use and the apparent longevity of corrugators. Report at A-15 - A-16. The continued sales of parts may be the result of PTC users extending the life of their installed PTCs by buying additional apparatus to replace worn out parts.

55/ See Metallverken Nederland B.V. v. United States, -- CIT --, No. 89-170, slip op. at 26 (Dec. 18, 1989).

56/ Report at A-14 - A-15 and Table 8.

57/ Because there is such a wide range in PTC prices and models, value is a more important indicator of market penetration than volume in this investigation.

58/ Report at A-15 and Table 9.

customer generally buys through negotiated bids directly from the supplier; the bidding is closed and often the buyer contacts only one producer to submit a quote. 59/

Staff requested domestic and Canadian PTC producers to provide pricing information for all quotes made to U.S. purchasers during the period of investigation. Staff also requested purchasers to provide pricing information for all quotes received for purchases of PTCs during the period. 60/

The price quotes varied according to the specific model of the machine quoted and options included in the bid. Often the initial bids by both petitioner and respondent included multiple options, such as different size dies or molds, of which the purchaser would select only one. Consequently, if the quote resulted in a sale, the final price might be substantially lower than the initial bid. In addition, both petitioner and respondent incorporate different standard options in the price of the basic machine. 61/ As a result, it is virtually impossible to make useful price comparisons. In any case, the record shows no clearcut instances of underselling by imports. Indeed, several purchasers have stated that respondent's prices were generally higher than petitioner's. 62/ We therefore find no significant underselling.

For both petitioner and respondent, the price ranges quoted for the overall PTC package, the actual sales prices and the individual corrugator

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59/ Id. at A-17 - A-18.

60/ Id. at A-18 - A-19.

61/ Id. at A-19.

62/ See id. at A-21 - A-22.

prices increased during the period of investigation. 63/ Consequently, we find no price depression. Both prices and profitability have increased during the period of investigation, and the record shows no evidence of price suppression by the subject imports.

Each purchaser stated that price was not the major factor in its buying decision. 64/ While petitioner alleged lost sales, the record does not show that pricing was the deciding factor. Rather, the purchasers of respondent's PTCs believed that respondent's technology was superior to petitioner's, respondent was more flexible in terms of responsiveness or was more reliable. 65/

Thus, we determine that there is no reasonable indication of material injury by reason of the allegedly subsidized imports. This determination is based not upon a lack of evidence as to whether the domestic industry is suffering material injury; rather, we find that the domestic industry is materially injured, but the record fails to support petitioner's claims that allegedly subsidized imports are a contributing cause. We also find that there is no likelihood that contrary evidence would arise in any final investigation. 66/

63/ Id. at A-19 - A-20, Tables 10 and 11.

64/ Id. at A-19. This is due in part to the fact that a purchaser can recover the cost of a custom-made PTC rather rapidly.

65/ See id. at A-19 - A-22, A-23.

66/ Little additional data could be collected in a final investigation. While two other machine/tool manufacturers have manufactured a very small number of corrugators for certain purchasers during the period of investigation, neither considers itself a PTC manufacturer as such, but works in conjunction with a prospective buyer to design and manufacture a machine to meet the buyer's particular needs. Report at A-5. Therefore, any additional information that might be obtained from these firms in a

(continued...)

IV. No Reasonable Indication of Threat of Material Injury by Reason of Allegedly Subsidized Imports from Canada

The Commission considers several specific factors, among others, to determine whether there is a reasonable indication that the subject imports threaten the domestic industry with material injury. These factors include:

(I) if a subsidy is involved, such information as may be presented to it by the administering authority as to the nature of the subsidy (particularly as to whether the subsidy is an export subsidy inconsistent with the Agreement);

(II) any increase in production capacity or existing unused capacity in the exporting country likely to result in a significant increase in imports of the merchandise to the United States;

(III) any rapid increase in United States market penetration and the likelihood that the penetration will increase to an injurious level;

(IV) the probability that imports of the merchandise will enter the United States at prices that will have a depressing or suppressing effect on domestic prices of the merchandise;

(V) any substantial increase in inventories of the merchandise in the United States;

(VI) the presence of underutilized capacity for producing the merchandise in the exporting country;

(VII) any other demonstrable adverse trends that indicate the probability that the importation (or sale for importation) of the merchandise (whether or not it is actually being imported at the time) will be the cause of actual injury;

(VIII) the potential for product-shifting if production facilities owned or controlled by the foreign manufacturers, which can be used to produce products subject to investigation(s) under section 1671 or 1673 of this title or to final orders under section 1671e or 1673e of this title, are also used to produce the merchandise under investigation;

66/(...continued)
final investigation is not likely to produce evidence contrary to that which is already in the record which formed the basis for our determination.

> (IX) in any investigation under this title which involves imports of both a raw agricultural product (within the meaning of paragraph (4)(E)(iv) and any product processed from such raw agricultural product, the likelihood that there will be increased imports, by reason of product shifting, if there is an affirmative determination by the Commission under section 1671d(b)(1) or 1673d(b)(1) of this title with respect to either the raw agricultural product or the processed agricultural product (but not both); and
>
> (X) the actual and potential negative effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the like product. 67/

The Commission is to base a determination that there is a reasonable indication that a domestic industry is threatened with material injury on evidence that the threat of material injury is real and that actual injury is imminent, not on mere conjecture or supposition. 68/

The only information available as to the nature and extent of the alleged Canadian subsidies is petitioner's allegations. Petitioner cites various government programs in Canada which it believes have granted the respondent subsidies on its manufacture and export of the subject product. Petitioner did not estimate a total net subsidy rate for respondent nor a rate for any of the individual programs from which respondent allegedly benefits. 69/ We find that petitioner's allegations, even if correct, are not dispositive given other information in the record such as the decline in import penetration.

Staff were unable to obtain any information on production capacity for PTCs or apparatus therefor in Canada. Respondent is not able to estimate

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67/ 19 U.S.C. § 1677(7)(F)(i).

68/ Id. at § 1677(7)(F)(ii).

69/ Report at A-1.

its capacity beyond what it has actually produced because of the considerable differences in lead times required to produce different machines. 70/

As explained above, there has been no rapid increase in U.S. market penetration by the subject imports. 71/ Except for a slight decline in the interim period, respondent's volume of total exports to countries other than the U.S. has increased dramatically. 72/ The value of exports also increased sharply from 1986 to 1988 and the value of shipments within Canada rose sharply, especially during the interim period. 73/ Thus, there appears no likelihood that respondent's penetration of the U.S. market will increase to an injurious level.

Likewise, it is improbable that PTC imports will depress or suppress domestic prices, in view of the lack of price competition discussed above and the fact that petitioner's prices and profitability have increased during the period of investigation. 74/

There are no inventories of the subject merchandise. PTCs are produced to order and shipped directly to end users. 75/ The record does not show any other adverse trends indicating the probability that the importation (or sale for importation) of PTCs or apparatus therefor will cause actual injury. Also, there is no potential for product-shifting because no other

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70/ See id. at A-12.

71/ Id. at A-14 - A-15 and Table 9.

72/ Id. at A-13, Table 6.

73/ Id. at A-13, Table 7.

74/ Id. at A-19 and A-20, Table 10.

75/ Id. at A-7.

investigations or orders involve any products similar to PTCs or apparatus therefor. 76/

The record does not show that the subject imports have any significant actual or potential negative effects on the existing development and production efforts of the domestic industry. Similarly, the record shows no adverse impact on development efforts for a new like product. 77/

Considering all the statutory factors in the context of this investigation, we conclude that, based on the record, there is no reasonable indication of a threat of material injury to the domestic PTC industry.

76/ See id. at A-1.

77/ See Tr. at 66-69 (Mr. Alexander and Mr. Dickhut).

DISSENTING VIEWS OF CHAIRMAN ANNE E. BRUNSDALE

Plastic Tubing Corrugators from Canada
Inv. No. 701-TA-301 (Preliminary)

December 22, 1989

I respectfully dissent from the negative determination reached by a majority of my colleagues. While I can understand their apparent inclination to dismiss an investigation that, in their minds, has little chance of success on the merits, I am of the view that the result in this case misconstrues the procedural requirements of a preliminary investigation, the substantive import of the evidence presented to us, or both.

Applicable Standard in Preliminary Determinations

The statute governing dumping and countervailing duty investigations provides that, within 45 days following the institution of an investigation, the Commission must determine whether the evidence of record establishes "a reasonable indication" of material injury, threat of material injury, or retardation of the establishment of an industry, by reason of the subject imports.[1] The Commission, citing American Lamb Co. v. United States,[2] has interpreted the statute to require a negative preliminary determination only when (1) the record contains clear and convincing evidence that there is no material injury to a

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[1] 19 U.S.C. § 1671b(a), 1673b(a). For convenience, and because I determine that the record provides a reasonable indication of material injury, this discussion will consider only injury.

[2] 785 F.2d 994 (Fed. Cir. 1986).

domestic industry **and** (2) there is no likelihood that evidence of such injury will be developed through further investigation.[3] In its preliminary decisions, the Commission has implemented the American Lamb standard by evaluating all of the evidence on the record to determine whether the record as a whole demonstrates the requisite likelihood that the Commission will render an affirmative final determination.[4]

I have addressed the nature of the preliminary standard in some detail in New Steel Rails from Canada[5] and Electrolytic Manganese Dioxide from Greece, Ireland, and Japan (EMD).[6] In Rails, I reviewed the procedural history of the preliminary standard, the legislative pronouncements on the subject, and the judicial actions addressing the issue. I noted that, under the statutory language and the judicially approved procedures for implementing that language, the Commission will render a negative determination "either because the evidence supporting the allegations in the petition does not amount to a 'reasonable

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[3] See, e.g., Sewn Cloth Headwear from, the People's Republic of China, Inv. No. 731-TA-405 (Preliminary), USITC Pub. 2096 (July 1988) at 7.

[4] Indeed, this was the central issue in American Lamb, i.e., whether the Commission could weigh the evidence on the record or was restricted to consideration of the evidence supporting an affirmative determination.

[5] Inv. Nos. 701-TA-297 and 731-TA-422 (Preliminary), USITC Pub. 2135 (November 1988) at 55-68 (Views of Acting Chairman Anne E. Brunsdale).

[6] Inv. Nos. 731-TA-406 - 408 (Preliminary), USITC Pub. 2097 (July 1988) at 21-25 ((Additional Views of Vice Chairman Anne E. Brunsdale, Commissioner Susan Liebeler, and Commissioner Ronald A. Cass).

indication of injury' or because the contrary evidence is so clear and convincing that any evidence supporting the petition did not amount to a reasonable indication."[7] In EMD I addressed the quantity of evidence necessary to support a preliminary determination:

> The Commission should reach negative determinations when the evidence now on the record on balance does not lend enough support to the Petitioner's claims to provide at least a colorable basis for an affirmative determination and when the relevant information that remains to be gathered does not leave open the prospect that any judgment made on the current record well might be changed at the final determination stage.[8]

Applying this approach -- derived from the language and history of the dumping and countervailing duty statutes in light of judicial pronouncements on the preliminary standard -- I am compelled to conclude in this case that the evidence on the record, as discussed below, provides a "reasonable" indication of material injury to a domestic industry. I can assume only that the majority viewed this evidence in an erroneous legal framework.[9]

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[7] New Steel Rails, supra, USITC Pub. 2135 at 67-68 (emphasis in original, footnote omitted); see also Shock Absorbers and Parts, Components, and Subassemblies Thereof from Brazil, Inv. No. 731-TA-421 (Preliminary), USITC Pub. 2128 (September 1988) at 5 ("[T]he Commission . . . may issue a negative preliminary determination if some evidence on the record supports an affirmative determination, or even if there is some reasonable doubt about whether an affirmative determination is warranted, as long as the evidence refuting the allegations of a petition is clear and convincing").

[8] EMD, supra, USITC Pub. 2097 at 23-24.

[9] Consistent with Commission practice (to which, incidentally, I am opposed), I have seen only that part of the General Counsel's

(continued...)

The Legal Framework

Section 771(7)(B) of the Tariff Act of 1930[10] provides in pertinent part:

> VOLUME AND CONSEQUENT IMPACT. -- In making determinations under [the statutes governing preliminary and final dumping and countervailing duty investigations] the Commission **in each case** --
>
> (i) shall consider --
>
> (I) the volume of imports of the merchandise which is the subject of the investigation,
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> (II) the effect of imports of that merchandise on prices in the United States for like products, and
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> (III) the impact of imports of such merchandise on domestic producers of like products, but only in the context of production operations within the United States.[11]

Tracking the framework of the statute, the petitioner has plainly made a case for continuation of this investigation.

With respect to the volume of imports, the statute specifies that the proper inquiry is whether that volume "is significant."[12] In this case, respondent's share of the domestic market for corrugators and related apparatus sold separately was consistently high throughout the period of investigation. While the precise figures are confidential, that

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[9](...continued)
draft of the majority's views with which I join -- i.e., the views on like product and domestic industry.

[10] 19 U.S.C. § 1677(7)(B).

[11] Emphasis added.

[12] Section 771(7)(C)(i), 19 U.S.C. § 1677(7)(C)(i).

share did not fall below 50 percent throughout the period of investigation.[13] Based on these data, I cannot help but conclude that the volume of Canadian imports is "significant."

The statutory command on the price effect of the subject imports is to consider whether "there has been significant underselling of the imports" and, particularly, whether "the effect of imports . . . depresses prices to a significant degree or . . . prevents price increases which otherwise would have occurred."[14] The record contains evidence of head-to-head competition between petitioner's product and the subject imports in bid competitions that account for approximately 20 percent of the units sold during the period of investigation.[15]

Concededly, the nature of the competition between petitioner and respondent is difficult to describe at this preliminary stage. The bid prices depend, among other things, on whether producer relies on vacuum-molding or blow-molding technology;[16] the bids may be for machines that have very different features;[17]

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[13] Report at A-15. Import penetration in the corrugator market has been much higher than in the apparatus market. Id.

[14] Section 771(C)(ii), 19 U.S.C. § 1677(C)(ii).

[15] While the respondent contends in its post-conference brief that it competes with petitioner in only one segment of the corrugator market, the record does not allow for a definitive evaluation of this argument. Furthermore, given the substantial percentage of the market represented by the bids in which petitioner and respondent have competed, I cannot be certain at this time that dumped imports into this one market segment do not themselves result in material injury.

[16] Report at A-17.

[17] Id.

and once a bid is accepted, the final price is negotiated between the buyer and the seller.[18] Although the products are not homogeneous, in light of the evidence of head-to-head competition in a competitive bidding context one cannot exclude the possibility that evidence in a final investigation would reveal a price effect sufficient to warrant an affirmative determination.

The statute's instructions on the assessment of the impact of the imports are to "evaluate all relevant economic factors which have a bearing on the state of the industry in the United States."[19] As I have indicated before, the economic factors the Commission must examine, particularly employment and investment in the industry, are largely driven by the volume and price effects discussed above.[20] In light of the uncertainties regarding those effects, I am not in a position to discuss the impact of the imports on industry performance with the degree of confidence necessary to render a preliminary negative determination.

One matter is also worth special mention. Petitioner specifically claimed that the performance of the industry, although improving in recent months, would be much brighter absent subsidized imports. The countervailing duty statute

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[18] Id.

[19] Section 771(C)(iii), 19 U.S.C. § 1677(C)(iii).

[20] Certain Telephone Systems and Subassemblies Thereof from Japan and Taiwan, Inv. Nos. 731-TA-426, -428 (Final), USITC Pub. 2237 (November 1989) at 112 n.26 (Dissenting Views of Chairman Anne E. Brunsdale).

specifically anticipates that the Commission will, on occasion, be presented with an industry that is improving; thus, we must view the relevant economic factors "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[21] While respondent argued forcefully that petitioner alone is responsible for its fate and that the domestic industry's recent performance demonstrates that fact, such a conclusion cannot be made on the evidence compiled thus far.

In light of the statute and the incomplete record, there is a "reasonable indication" that this investigation would lead to an affirmative injury determination if allowed to continue. I see no clear and convincing evidence that a domestic industry is neither materially injured or threatened with material injury, nor can I conclude that the evidence that might have been gathered in a final investigation would not lead to an affirmative determination. I therefore dissent from the Commission's negative determination.

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[21] Section 771(C)(iii), 19 U.S.C. § 1677(C)(iii).

DISSENTING VIEWS OF VICE CHAIRMAN RONALD A. CASS

Plastic Tubing Corrugators from Canada
Inv. No. 701-TA-301 (Preliminary)

I dissent from the decision reached by a majority of my colleagues in this investigation, although I join the determination of my colleagues as to the domestic like product and domestic industry in this investigation. I determine that there is a reasonable indication that an industry in the United States has been materially injured by reason of unfairly traded imports of plastic tubing corrugators ("PTCs") from Canada.

Although I have not seen the opinion of the majority that has been drafted by the Commission's Office of the General Counsel, other than the portion of that opinion dealing with the like product and domestic industry issues,1/ I do not believe that a negative determination can be reached in this investigation consistent with the legal standard applicable to these decisions under Title VII of the Tariff Act of 1930,2/ much less under the legal standards employed by commissioners now voting to terminate the instant investigation.3/ I discuss the legal standard first, as applicable to this investigation, and then turn to the evidence respecting

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1/ See note 34, infra.

2/ 19 U.S.C. §§ 1671b, 1673b.

3/ See discussion, infra.

material injury to a domestic industry by reason of the subject, allegedly subsidized imports.

I. LEGAL STANDARD GOVERNING DISPOSITION OF PRELIMINARY INVESTIGATIONS

The legal standard that controls disposition of preliminary investigations under Title VII of the Tariff Act of 1930 is set forth in sections 703(a) and 733(a) of the Act, as amended.4/ Under these statutory provisions, we are required to determine, based upon the best information available to us, whether there is a reasonable indication that a domestic industry has been materially injured, or is threatened with such injury, by reason of unfairly traded imports.5/ The application of this standard in our Title VII cases has engendered a great deal of discussion and, on certain occasions, disagreement within the Commission.6/

In other cases, I have discussed at some length my understanding of the relevant legal principles, and their relationship to the language and legislative history of Title VII and relevant judicial precedent, including the decision of the United States Court of

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4/ The standard is codified at 19 U.S.C. § 1671b(a) (countervailing duty investigations) and at 19 U.S.C. § 1673b(a) (antidumping investigations).

5/ Because the domestic industry is already well-established, material retardation of a domestic industry is not at issue in this investigation. For purposes of this discussion of the legal standard governing preliminary investigations, material retardation is subsumed within the concept of material injury.

6/ See, e.g., New Steel Rails from Canada, USITC Pub. 2135, Inv. Nos. 701-TA-297, 731-TA-422 (Preliminary) (Nov. 1988) ("New Steel Rails I") (Additional Views of Acting Chairman Brunsdale) (Additional Views of Commissioner Cass) (Additional Views of Commissioner Eckes).

Appeals for the Federal Circuit in American Lamb Co. v. United States.7/ Although I do not believe that similarly extended discussion of these issues is warranted here, a brief repetition of certain key points may be helpful to an understanding of my disposition of this investigation.

First, less evidence is required to make the requisite showing of injury in a preliminary investigation than in a final investigation.8/ It is clear that Congress intended to "weight the scales in favor of affirmative and against negative determinations."9/ Thus, the quantum of proof required to sustain an affirmative determination in a preliminary investigation is lower than that required in order to support such a determination in a final investigation. By the same token, however, the "reasonable indication" standard plainly was not intended to preclude any possibility of negative determinations in preliminary investigations.

As the Court of Appeals made clear in its decision in American

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7/ 785 F.2d 994 (Fed. Cir. 1986).

See, e.g., Certain Telephone Systems from Japan, Korea and Taiwan, USITC Pub. 2156, Inv. Nos. 731-TA-426-28 (Preliminary) 53-63 (Feb. 1989) (Additional Views of Commissioner Cass) ("Telephone Phone Systems I"); Generic Cephalexin Capsules from Canada, USITC Pub. 2143, Inv. No. 731-TA-433 (Preliminary) 39-45 (Dec. 1988) ("Cephalexin Capsules") (Dissenting Views of Commissioner Cass); New Steel Rails I, supra, at 19-31 (Additional Views of Commissioner Cass).

8/ See, e.g., Telephone Systems I, supra, at 54-55 (Additional Views of Commissioner Cass); New Steel Rails I, supra, at 21 (Additional Views of Commissioner Cass).

9/ American Lamb Co. v. United States, supra, 785 F.2d at 1001; see also Yuasa-General Battery Corp. v. United States, 688 F. Supp. 1551, 1553-54 (Ct. Int'l Trade 1988).

Lamb, in articulating this standard, Congress sought to balance two competing concerns.10/ To safeguard against the rejection of meritorious petitions, Congress provided that investigations should not be terminated in their preliminary stage simply because the evidence of record is not sufficient to support an affirmative determination in a final investigation. Congress also believed, however, that the costly process of final investigations both by this Commission and by the Department of Commerce, with the attendant disruptive effect upon trade, should not be endured unless there is sufficient indication of injury to a domestic industry to justify incurring such costs. This is the very reason why Congress provided for a preliminary investigation.11/

Second, we must consider all of the evidence before us, not just the evidence offered in support of an affirmative determination, in deciding whether there is a reasonable indication of injury or threat

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10/ See American Lamb Co. v. United States, supra, 785 F.2d at 1002-3, citing S. Rep. No. 1298, 93rd Cong., 2d Sess. 171 (1974).

11/ The legislative history of the Trade Act of 1974 Act, the statute in which the concept of a preliminary investigation originated, contained the following statement:

> Under the present Act, the Secretary of the Treasury must complete his entire investigation as to sales at less than fair value before the matter can be referred to the International Trade Commission for its injury determination. The Committee felt that there ought to be a procedure for terminating investigations at an earlier stage where there was no reasonable indication that injury or the likelihood of injury could be found . . . . The amendment is designed to eliminate unnecessary and costly investigations which are an administrative burden and an impediment to trade.

S. Rep. No. 93-1298, 93rd Cong., 2d Sess. 170-71 (1974).

thereof.12/ This has been the Commission practice for some time, and the practice has been approved by our reviewing courts in American Lamb and in other cases.13/ In weighing competing evidence, the Commission's practice, also approved by our reviewing courts, has been to view evidence in a light favorable to petitioners; inferences adverse to petitioners' case are drawn only where the opposing evidence clearly and convincingly refutes the evidence and argument advanced by petitioners.14/ The "clear and convincing" evidentiary standard may be applied differently by different commissioners, a matter I address further below. Whatever disparities may be found in its application, however, this standard has been generally understood to mean that a negative determination will not be reached in a preliminary investigation simply because on each substantive issue the Commission finds the weight of the evidence marginally favors an inference consistent with such a decision.

Finally, the absence of evidence necessary to an affirmative finding of injury from subsidized imports does not necessarily indicate that a negative determination is appropriate. Rather, we must consider the present lack of such evidence in light of the

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12/ See American Lamb Co. v. United States, supra, 785 F.2d at 1002-04.

13/ See, e.g., Yuasa-General Battery Corp. v. United States, cited, supra, at note 9.

14/ See Certain Welded Carbon Steel Pipes and Tubes from the Republic of Korea and Taiwan, Inv. No. 731-TA-131 and 132 (Preliminary), USITC Pub. 1324 (June 1983); Canned Mushrooms from the People's Republic of China, Inv. No. 731-TA-115 (Preliminary), USITC Pub. 1324 (December 1982).

likelihood that in a final determination evidence might be developed that would support an affirmative decision.15/

I note that my reading of the standard set forth in Title VII and interpreted by our reviewing courts, most notably in American Lamb, has differed somewhat from that of at least some of my colleagues. There have been two principal points of disagreement respecting the standard for our preliminary determinations. The first of these concerns the weight to be given to conflicting evidence. The second concerns the treatment of evidentiary gaps.

In recent years, the differences among commissioners respecting both these points have been framed largely as differing interpretations of the language employed by the Federal Circuit in American Lamb. In that case, the Court stated that the Commission's practice is to

> issue a negative determination . . . only when (1) the record as a whole contains clear and convincing evidence that there is no material injury; and (2) no likelihood exists that contrary evidence will arise in a final investigation.16/

The Court then held that the Commission's practice, as the Court understood it, was "permissible within the governing statute".17/

Following American Lamb, some members of this Commission have read the law as placing a burden on respondents to demonstrate by clear and convincing evidence that the relevant domestic industry has

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15/ See, e.g., Certain Residential Door Locks from Taiwan, USITC Pub. 2198, Inv. No. 731-TA-433 (Preliminary) 5-6 (June 1989) (Views of Chairman Brunsdale and Vice Chairman Cass).

16/ American Lamb Co. v. United States, supra, 785 F.2d at 1001.

17/ Id.

not suffered material injury from dumped or subsidized imports, or (after the Court of International Trade's decision in the Yuasa-General case)18/ the even more onerous burden of demonstrating by clear and convincing evidence that there is not even a reasonable indication of such injury from the imports under investigation.19/ Moreover, these commissioners have repeatedly emphasized that the absence of information that normally would be considered requires an affirmative determination in preliminary investigations, without regard for the relation of that information to the likely disposition of a final investigation, so long as there is a possibility that such information could be obtained in a final investigation.20/

I have objected to this construction of American Lamb as a misreading of the opinion, and as even more clearly a marked departure from the statutory text that must be the touchstone for our determinations, from the legislative history that may inform reading

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18/ In that case, the Court referred to the two-part test approved in American Lamb as a "requirement". The Court did not indicate, however, whether this test must be applied in all cases, or whether the standard was required in that case because of its adoption by the Commission during the particular administrative proceedings that were the subject of that case. See Yuasa-General Battery Corp. v. United States, supra, 688 F. Supp. at 1553-54, note 2 ("Defendant's memorandum states . . . that 'there is no question in this case that this is the standard applicable'") (emphasis added).

19/ See, e.g., Shock Absorbers and Parts, Components, and Subassemblies Thereof from Brazil, USITC Pub. 2128, Inv. No. 731-TA-421 (Preliminary) 34-39 (September 1988) ("Shock Absorbers") (Views of Commissioner Eckes).

20/ See, e.g., Shock Absorbers, supra, at 35, 39 (Views of Commissioner Eckes); New Steel Rails I, supra, at 15-18 (Views of Commissioner Eckes); Fresh, Chilled, or Frozen Pork from Canada, USITC Pub. 2158, Inv. No. 701-TA-298 (Preliminary) (February 1989) (Views of Commissioners Eckes, Lodwick, and Newquist) ("Fresh, Chilled or Frozen Pork").

of that text, and from the precedents of this Commission and of our predecessor agency in this arena.21/ In these opinions, I have reviewed the authorities relevant to construction of the legal texts and explained why they are at odds with this interpretation of the American Lamb standard.22/ Moreover, I have argued that, as a practical matter, the requirements articulated previously by some of my colleagues would make preliminary investigations -- which consume a substantial amount of the time and resources of the Commission and the parties who appear before us -- an essentially meaningless process in all but the very rare case where we are asked to consider a patently unmeritorious petition.23/

The only basis for the argument that the Commission must issue affirmative determinations in preliminary investigations unless respondent offers clear and convincing evidence of the absence of material injury from the subject imports is a wooden, acontextual reading of the Federal Circuit's language in American Lamb. There is even less basis for the argument that respondent must by clear and convincing evidence show that there is not even a plausible indication of such injury. The treatment of evidentiary gaps as requiring an affirmative determination, regardless of the likelihood of such evidence favoring petitioner or of its probable contribution,

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21/ See New Steel Rails I, supra, at 19-31 (Additional Views of Commissioner Cass); Cephalexin Capsules, supra, at 39-45 (Dissenting Views of Commissioner Cass).

22/ Id.

23/ New Steel Rails I, supra, at 30 (Additional Views of Commissioner Cass).

even if favorable, to an affirmative disposition of the final investigation, rests on similarly soft ground.

Reacting to criticisms such as these, my colleagues have endeavored to make clear that they did not intend to adopt a standard that in effect would produce only affirmative decisions in preliminary investigations. Commissioner Eckes, for example, commented:

> Some lawyers also seem to think that my interpretation of Yuasa as mandating "clear and convincing evidence of no reasonable indication of material injury" for a preliminary negative determination is tantamount to resurrecting the CIT's "mere possibility" standard from Republic Steel [requiring affirmative determinations in preliminary investigations if there is even the mere possibility of an affirmative disposition of a final investigation]. . . . Nor do the present views support any inference that the standard of "clear and convincing evidence of no reasonable indication of material injury" is subterfuge for employing a "mere possibility" standard. Those who believe that the two standards are identical conveniently overlook that the second requirement for a negative preliminary determination in American Lamb -- the requirement that "no likelihood exists that contrary evidence will arise in a final investigation -- has no place in the "mere possibility" standard employed in Republic Steel.24/

As the quoted language makes plain, the issues presented by the legal standard articulated in other preliminary investigations by some of my colleagues is not whether they have been overly solicitous of the interests of respondents but instead whether their approach to preliminary determinations is akin to pushing against an open door; in other words, despite protestations to the contrary, the standard they have advanced in prior views makes an affirmative determination all but inevitable. Commissioner Eckes' distinction of his standard

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24/ New Steel Rails I, supra, at 17-18 (Views of Commissioner Eckes) (emphasis in original; footnote omitted).

from the mere possibility standard of Republic Steel is especially instructive in this regard. His defense to the charge of using a standard that so demonstrably adumbrates an affirmative determination as to be violative of the statutory charge, if stated in a straightforward manner, is this: he does not use the mere possibility standard, although one prong of his two-part analysis looks similar to that; instead he uses an analysis that makes it more difficult to reach a negative determination because it also requires the absence of any likelihood of contrary information being developed in a final investigation.

While I do not believe that any commissioner, Commissioner Eckes included, has actually voted in a manner that is consistent with the standard he has articulated, the votes of fellow commissioners in prior investigations show a remarkable unwillingness to conclude preliminary investigations with negative determinations even where the evidence is fairly clear that there is little possibility that the allegedly unfair imports, with minuscule market shares, trivial margins of dumping or subsidy, and so on, are materially injuring a domestic industry.25/ It is inconceivable that my colleagues voting today in the negative in this investigation could do so consistent with the legal standard implicit in some of their prior decisions and explicit in others.

Predicating a negative determination in this investigation on the statutory standard that the Commission has in fact followed in a

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25/ See, e.g., Fresh, Chilled or Frozen Pork, supra, at (Views of Commissioners Eckes, Lodwick, and Newquist); Cephalexin Capsules, supra, at (Views of Commissioners Eckes, Lodwick, Rohr, and Newquist).

far greater number of investigations would be only slightly less striking. Under that standard, the Commission may issue a negative determination either because the evidence of record in support of a petition, from the petitioner and other sources including that gathered by the Commission's staff, does not, standing alone, amount to a reasonable indication of injury or threat of injury, or because the contrary evidence is so clear and convincing that the evidence supporting the petition cannot on the record as a whole be said to provide reasonable indication of injury. In this case, I do not believe that a negative determination can be justified on either of these bases. As discussed below, some undisputed evidence plainly supports the petition; other evidence either is as yet undeveloped or is the subject of contradictory assertions by the Petitioner and the Respondent. If this were a final investigation, in which the statutory mandate does not incorporate an evidentiary standard favoring affirmative determinations, there would be every reason to believe that a negative disposition of the investigation would be appropriate. But if the evidence here is viewed in accord with the legal standard contained in our governing law and with the Commission's normal practice, it surely provides ample basis for finding a reasonable indication of material injury from the allegedly unfair imports.

One further note should be registered before turning in detail to the evidence of record. The discussion above of the legal standard for our preliminary determinations elides one matter of considerable consequence to those decisions. I do not address, save

in passing, the underlying substantive requisites of Title VII proceedings to which the evidentiary standard set out above applies. These have been the subject of considerable discussion of late,26/ and differing interpretations of these requirements certainly affect commissioners' disposition of preliminary investigations. Having addressed the substantive statutory requirements of Title VII at what even the most patient and interested reader would have to describe as considerable length and perhaps excruciating detail, I will not recapitulate that discussion here except to make two very small points about the divergent substantive standards.

First, some of my colleagues read Title VII as if it gave independent weight to the overall condition of the domestic industry, apart from the effect of the allegedly unfair imports on the industry, or to the trends in various indicia of that condition.27/ In some cases, they may conclude that the domestic industry is not "injured" because it is enjoying profits or because other indicia of

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26/ See, e.g., Certain Telephone Systems and Subassemblies Thereof from Japan and Taiwan, USITC Pub. 2237, Inv. Nos. 731-TA-426 and 428 (Nov. 1989) ("Telephone Systems I") (Dissenting Views of Vice Chairman Cass) (Additional Views of Commissioner Eckes); New Steel Rails from Canada, USITC Pub. 2217, Inv. Nos. 701-TA-297 and 731-TA-422 (Final) (Sept. 1989) ("New Steel Rails II") (Dissenting Views of Vice Chairman Cass) (Additional Views of Commissioner Eckes) (Additional Views of Commissioner Rohr).

27/ For more thorough discussions of this point, as well as exposition of some of the difficulties of plumbing colleagues' less than uniform opinions on the nature of this inquiry, see Telephone Systems II, supra, at 171-228 (Dissenting Views of Vice Chairman Cass); New Steel Rails II, supra, at 142-159 (Dissenting Views of Vice Chairman Cass); 29-70 (Additional Views of Commissioner Eckes); 71-82 (Additional Views of Commissioner Rohr); Digital Readout Systems and Subassemblies Thereof from Japan, USITC Pub. 2150, Inv. No. 731-TA-390 (Final) 95-119 (Jan. 1989) ("Digital Readout Systems Final") (Concurring and Dissenting Views of Commissioner Cass).

health are sufficiently strong or because these indicia are improving.28/

Even if one accepted that standard, here a negative result could be reached on that basis only by fairly selective review of the evidence. The industry has reported losses in two of the three fiscal years for which data have been submitted and was only modestly profitable in the most recent fiscal year. Especially given the very small number of machines sold in this industry, we cannot with any confidence draw conclusions about the change in profitability in a single year without considerably more inquiry into the bases for variations in sales and profits. We have not yet even explored the bona fides of the industry's profitability figures. The domestic industry is essentially a single, family-run business, where salaries, rent, and expense figures involve transfers from one pocket to another within the same family. I do not, for that reason, question the legitimacy of the data reported to us, but I would be loath to base a decision on movements in these figures without giving them significantly more scrutiny. Other indicia of industry health are similarly affected by the small size of the industry, the small volume of PTCs sold annually, and the absence of better information about the sources of variability in this market. I do not know whether my colleagues have chosen to rely on the condition of the

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28/ See, e.g., Light-Duty Integrated Hydrostatic Transmissions and Subassemblies Thereof, With or Without Attached Axles, from Japan, USITC Pub. 2149, Inv. No. 731-TA-425 (Preliminary) (Jan. 1989); Digital Readout Systems and Subassemblies Thereof from Japan, USITC Pub. 2081, Inv. No. 731-TA-390 (Preliminary) (May 1988).

industry for their negative determination, but I would be surprised if such reliance could be justified.

Second, some of my colleagues read the statute as imposing a much different causal requirement respecting the relation between the imports subject to investigation and the condition of the domestic industry than I find in Title VII. At the extreme, some have used what I have described as a "minimal causation" approach.29/ For those commissioners, having found that there is a bad or deteriorating condition in a domestic industry, all that is required further is some nexus between the class of imports under investigation and some part of the adversity being experienced. As has recently been explained, this approach posits that "an affirmative determination requires only that imports be a contributing cause to the material injury experienced by the domestic industry."30/ The minimality of the hurdle posed by this standard becomes apparent when one combines that statement with three other aspects of this approach: first, that the causal agent in this analysis is not the unfair trade practice (dumping or subsidization) nor the unfairly traded imports, but rather is the entire class of merchandise some of which was found to be dumped or subsidized;31/

29/ See Telephone Systems II, supra, at 146-241 (Dissenting Views of Vice Chairman Cass).

30/ Telephone Systems II, supra, at 85 (Views of Commissioner Eckes) (emphasis in original).

31/ See, e.g., Telephone Systems II, supra, at 80-84 (Views of Commissioner Eckes). Commissioner Eckes emphasized that the Commission in his opinion "is to examine the class of merchandise, not simply dumped imports." Id. at 84.

second, in this approach, the causal predicate, the injury to which the imports must be found to contribute, is not really a product of the causal act but simply is the bad or worsening condition of the domestic industry;32/ and third, the magnitude of the change to which the imports must "minimally" contribute is itself only a "slight" change.33/

Looking at the standard framed by this set of decisional criteria, it is not at all surprising that some commissioners have difficulty finding cases in which the industry is performing poorly but that fail to meet their causation standard. Indeed, until publicly chastised for employing such a standard, one commissioner, so far as I can discern, never once over a five-year period found an occasion in which a petitioner failed to satisfy his causation standard. Over the past few months, his causation standard, while not explicitly changed in the least, has found new teeth. Petitioners most likely to get bitten by this new-found ferocity, however, tend to be those who appear least likely to appeal from a negative determination. I hope that does not in any measure explain the disposition of this investigation. As noted earlier, I do not know whether my colleagues have predicated their decision on this basis, but I would find it extraordinary if they did, and particularly extraordinary if one colleague's usually quiescent causal watchdogs should become aroused against allowing a full

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32/ Id. at 63-80.

33/ See, e.g., New Steel Rails II, supra, at 40, note 20 (Additional Views of Commissioner Eckes).

investigation of subsidies when subject imports account for more than half of domestic consumption, when the Department of Commerce has concluded that sufficient supporting information was submitted to investigate nine different Canadian programs for allegedly countervailable subsidies, and when critical information on the nature of the competition between Petitioner's and Respondent's products is disputed.

No matter what standard is used here, it is not possible consistent with past use of that standard to reach a negative determination in this investigation.

II. DOMESTIC LIKE PRODUCT AND DOMESTIC INDUSTRY

My differences with the Commission majority in this investigation are not a function of any disagreement over the appropriate definition of the domestic like product or the domestic industry producing that product. I believe that the Commission majority has chosen appropriate like product and domestic industry definitions, and also agree generally with the rationale offered for those definitions in the opinion that was written for the Commission

majority by the Office of the General Counsel.34/ Accordingly, I will not elaborate further on my views on those issues here.

III. REASONABLE INDICATION OF MATERIAL INJURY BY REASON OF SUBSIDIZED IMPORTS: PLASTIC TUBING CORRUGATORS FROM CANADA

As I have explained elsewhere, in assessing the effects of dumped or subsidized imports, it is necessary to compare the condition of the domestic industry to the condition that would have existed had there not been unfairly traded imports, and to then determine whether the change in the circumstances of the industry that resulted from dumping or subsidization constitutes material injury.35/

Title VII directs the Commission, in assessing the causation of injury by dumped or subsidized imports, to consider, among other factors:

> (i) the volume of imports of the merchandise which is the subject of the investigation,
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> (ii) the effect of imports of that merchandise on prices in the United States for like products, and

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34/ The Office of the General Counsel has made available to me the portion of the majority opinion that discusses these issues. Consistent with the practice in other investigations, however, the remaining portions of the majority opinion have been withheld from dissenting Commissioners by the General Counsel's office at the direction of certain Commissioners included in the Commission majority. I note that this practice continues even though it has been explicitly criticized by our reviewing courts. See Borlem S.A. v. United States, Ct. No. 87-06-00693, slip op. 89-93, at 24, note 4 (Ct. Int'l Trade, June 29, 1989).

35/ See, e.g., 3.5" Microdisks and Media Therefore from Japan, USITC Pub. 2076, Inv. No. 731-TA-389 (Preliminary) (April 1988) (Views of Commissioner Cass).

(iii) the impact of imports of such merchandise on domestic producers of like products . . . ."36/

Other provisions of the statute spell out these three factors with greater particularity.

The statutory text does not identify all of the factors relevant to an assessment of whether unfairly traded imports have materially injured a domestic industry. Indeed, the statute explicitly contemplates that the Commission will consider relevant economic factors in addition to those identified in the statute.37/ The factors that are listed in the statute and the order in which they are listed nevertheless provide us with important guidance respecting the essential elements of the inquiry to be performed. Three related questions are identified as critical to an assessment of the possible existence of material injury by reason of dumping or subsidization.

First, we are to examine the volumes of imports of the merchandise under investigation. The absolute volumes of imports and their magnitude relative to domestic sales of the competing like

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36/ See 19 U.S.C. § 1677(7)(B).

37/ See 19 U.S.C. § 1677(7)(C).

Under Title VII, as amended by the Omnibus Trade and Competitiveness Act of 1988, we are required to explain how these factors affect the outcome reached in any particular investigation. The statute also requires Commissioners to describe the relevance of other economic factors that we consider in addition those specifically identified in the statute. See Pub. L. No. 100-418, § 1328(1), 102 Stat. 1107, 1205 (to be codified as 19 U.S.C. § 1677(7)(B)(ii)). I have explained in detail in other opinions how the three-part inquiry that I employ considers certain other economic factors relevant to an assessment of the impact of unfairly traded imports on the domestic industry producing the like product -- e.g., dumping margins -- in addition to the specific factors listed in the statute. See, e.g, New Steel Rails I, supra, at 35-37; Cephalexin Capsules, supra, at 56-58.

product are both relevant to this question. So, too, is the effect of dumping or subsidization on the prices of the imports, as the change in import volumes brought about by dumping or subsidization will be closely related to changes in the prices of the imports that occurred as a result of sales at less-than-fair-value or subsidized prices.

Second, we must attempt to determine how dumping or subsidization of the subject imports affected prices, and concomitantly sales, of the domestic like product. Beyond examining evidence of the prices at which imports and domestic like products are sold, evidence bearing on three issues is central to an analysis of this question: the share of the domestic market held by the subject imports; the degree to which consumers see the imported and domestic like products as similar (the substitutability of the subject imports and the domestic like product); and the degree to which domestic consumers change their purchasing decisions for these products based on variations in the prices of those products.

Finally, we must evaluate the extent to which these changes in demand for the domestic like product caused by unfairly traded imports affected the financial and employment performance of the domestic industry, and determine whether these effects are material.38/ Such factors as return on investment and the level of

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38/ The judgment as to whether these effects are "material" within the meaning of the statute may be assimilated to the third inquiry or may be seen as a fourth part of our inquiry. See Digital Readout Systems Final, supra, at 117-19 (Concurring and Dissenting Views of Commissioner Cass).

employment and employment compensation in the domestic industry must be examined in considering that issue.39/

A. Volumes and Prices of the Subject Imports

At present, imports of allegedly subsidized PTCs from Canada appear to account for nearly all PTCs and apparatus therefor imported into the United States.40/ Indeed, no imports of PTCs from any other country have been reported since 1987.41/ Furthermore, the subject imports account for a majority of the both the quantity and value of domestic consumption.42/ Put another way, they are the dominant factor in the domestic marketplace.

In 1988, for example, [*] PTCs, accounting for [*]% of PTCs purchased in the United States that year, were imported from Canada.43/ During the same year, PTCs and apparatus therefor imported from Canada were valued at almost $[*],44/ and accounted for [*]% of the value of domestic consumption of such items.45/ During the first nine months of this year, [*] PTCs were imported from the United States, and these imports represented [*]%

39/ In making each of these inquiries under the statute, we are to consider the particular dynamics of the industries and markets at issue. See new Section 771(7)(C)(iii) of the statute (to be codified at 19 U.S.C. § 1677(7)(C)(iii)). See also S. Rep. No. 71, 100th Cong., 1st Sess. 117 (1987).

40/ Report at A-15, Table 9.

41/ Id.

42/ Id.

43/ Id.

44/ Id. at A-14, Table 8.

45/ Id. at A-15, Table 9.

of the PTCs purchased domestically.46/ Imports from Canada of PTCs and PTC apparatus in that interim nine-month period were valued at approximately $[*],47/ and accounted for [*]% of the value of domestic consumption of such items.48/ By way of comparison, import levels in 1986 and 1987 in quantity terms were somewhat higher than in full year 1988, both in absolute terms and relative to the total domestic market.49/ In value terms, import levels in value terms in 1986 and 1987 were also somewhat higher than in 1988, but were slightly lower as a percentage of total domestic consumption.50/ By any measure, then, the volume of imports in the subject investigation is substantial.

On the basis of the record before us, there is reason to believe that these import volumes were significantly affected by subsidization. Although we do not have in this preliminary investigation any information respecting the magnitude of the subsidization that has allegedly occurred, the Department of Commerce has initiated an investigation of nine separate Canadian governmental programs that have allegedly provided Respondent with countervailable subsidies.51/ Commerce has found that there is sufficient evidence

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46/ Id.

47/ Id. at A-14, Table 8.

48/ Id. at A-15, Table 9.

49/ Id.

50/ Id.

51/ See Initiation of Countervailing Duty Investigation of Plastic Tubing Corrugators from Canada by the Department of Commerce at 5.

to warrant an investigation of each of these programs.52/ Accordingly, the information now before us certainly leaves open the possibility that the subject imports will ultimately be found to have been subsidized to a significant extent. There is, therefore, at least a reasonable indication in the record before us that subsidization reduced the prices of the subject imports, and thereby contributed in significant measure to the large volume of imports from Canada that have taken place.

B. Effects on Domestic Prices and Sales

In determining how subsidization of the subject imports affected prices, and concomitantly sales, of the domestic like product, it is necessary to take into account certain evidence in addition to the record evidence relating to import volumes.53/ The record evidence respecting three issues is critical to such an analysis: the share of

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52/ The Commerce Department declined to initiate an investigation of two other programs cited by Petitioner as countervailable subsidies because Petitioner did not provide sufficient supporting documentation. Id. at 6.

53/ Congress explicitly has asked us to look for the existence of significant price underselling. 19 U.S.C. § 1677(7)(C)(ii). The occurrence of price differences between imports and domestic products, however, cannot provide a basis for inference of effects of subsidization or of subsidized imports on domestic products' prices without analysis of various product features and sales terms that may differ across products and sales. See, e.g., Certain Granite from Italy and Spain, USITC Pub. 2110, Inv. Nos. 701-TA-289 and 731-TA-381 (Final) (Aug. 1988). In this investigation, as in many others, the differences among the products under investigation prevent compilation of a meaningful comparison of product prices from which direct inferences respecting pricing practices and their effects can be sensibly derived. That, of course, does not preclude serious consideration of the degree to which opportunities for subsidized sales of Respondent's products have affected the prices, and sales, of Petitioner's product and returns to the Petitioner's business; it only constrains the methodology available to conduct such inquiries.

the domestic market held by the subject imports; the degree to which domestic consumers change their purchasing decisions for these products based on variations in the prices of those products; and the substitutability of the subject imports and the domestic like product.

As discussed in more detail below, on the first two of these issues -- the import market share and the price responsiveness of domestic demand for PTCs -- the evidence presented to us in this preliminary investigation clearly weighs in favor of Petitioner. On the third issue -- the substitutability of the domestic like product and the subject imports -- the parties have presented us with radically conflicting versions of the facts, and we have no independent information that would allow us presently to determine which version is correct. The uncorroborated information presented by Respondent on this issue therefore falls far short of the clear and convincing evidence that would be required in this preliminary investigation in order to overcome the evidence presented by Petitioner.

As previously discussed, the level of import market penetration is substantial by any standard. During all relevant periods and by all relevant measures, the subject imports accounted for more that 50% of domestic consumption.

The information respecting the extent to which domestic demand for PTCs is responsive to prices of such products likewise weighs unambiguously in favor of an inference that the alleged subsidization significantly and adversely affected prices and sales of the domestic

like product. Evidence concerning this issue is significant because, when consumer demand for the product group in which subject imports are included is highly responsive to changes in price, the effects of subsidization on prices and sales of the domestic like product are attenuated, for in that case the lower prices accompanying subsidization of the subject imports will stimulate significantly increased domestic demand for the lower-priced product. Conversely, much greater effects will be felt by U.S. producers when consumers perceive no difference between the imported and domestic product other than price but their overall purchases of these products are relatively unresponsive to price changes. In the latter case, consumers will simply switch their purchases from U.S.-made to lower-priced imported products, with resulting adverse effects on both prices and sales of the domestic product.

In this investigation, the record evidence concerning the price responsiveness of domestic demand for PTCs suggests that it is quite unlikely that the lower prices accompanying subsidization produced significantly increased demand for PTCs. PTCs are the only product that can produce corrugated tubing in continuous lengths.54/ Certain injection molding and blow molding machines can produce corrugated tubing of similar design and quality to that produced by PTCs, but only in predetermined lengths.55/ Consequently, any producer who seeks to supply tubing to domestic consumers who require continuous corrugated tubing has no realistic alternative other than to purchase

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54/ Report at A-3.

55/ Id.

a PTC. Demand for PTCs is therefore relatively unresponsive to changes in the price of that product.

The remaining issue, which may prove quite important in any final investigation, concerns the extent to which domestically produced PTCs are substitutable for imported Canadian-made PTCs. As previously noted, on this issue, there is a notable lack of agreement between the parties.

Respondent claims that its machines and the markets that they serve are quite different from those of Petitioner. Respondent asserts, for example, that it manufactures PTCs for the automotive, medical and fiber-optic specialty markets that are relatively small, and that produce tubing that is much smaller in diameter than any tubing that can be produced by Petitioner's machines; conversely, Respondent alleges that it makes PTCs for the sewer specialty market that are quite large and that produce large-diameter tubing that cannot be made by Petitioner's machines.56/ Respondent claims that it offers PTCs that can form tubing through either a blow-molding or a vacuum process, while Petitioner produces only vacuum-forming PTCs.57/ Respondent contends that its PTCs can produce tubing from certain plastics that Petitioner's machines are not capable of handling, such as PVC.58/ Respondent also notes that there are significant differences in the features offered on Petitioner's and Respondent's PTCs. For example, Petitioner's PTCs are said to have

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56/ Respondent's Brief at 49.

57/ Id. at 27, n. 22.

58/ Id. at 28-29.

various standard features, such as a pipe after-cooler, automated temperature cooler, vacuum assist and carrier bases, that Respondent offers as options; Respondent also claims its PTC models offer certain features that Petitioner's models do not.59/

Petitioner either flatly denies these assertions or minimizes their significance. For example, Petitioner claims that its PTCs can make tubing that is essentially as narrow or as large in diameter as any tubing that can be made on Respondent's machines.60/ Petitioner states that Respondent is simply incorrect in asserting that Petitioner's machines cannot make tubing out of PVC and other plastics that Respondent believes that Petitioner's machines are not capable of handling.61/ Finally, Petitioner contends that it is capable of making PTCs that use a blow-molding process, but that it does not do so because consumers universally prefer the vacuum-forming process.62/

In this preliminary investigation, the Commission has little, if any, independent information which would enable us to assess these competing claims. We know, for example, that Respondent's PTCs have produced tubing of both smaller and larger internal dimensions than Petitioner's PTCs,63/ but we do not know whether Petitioner is

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59/ Id. at 29.

60/ Petitioner's Brief at 8-9, 14-15. See also Transcript of 11/28/89 Conference ("Tr.") at 57-58.

61/ Petitioner's Brief at 14; tr. 59.

62/ Petitioner's Brief at 6-7.

63/ Report at A-3.

capable of producing machines that would be considered suitable by manufacturers of smaller and larger diameter tubing. We know also that Respondent has manufactured machines that have processed a wider array of plastics than those used in Petitioner's PTCs,64/ but, again, we do not know whether there is any limitation on Petitioner's machines that would prevent PTC users from using certain plastics with the same efficiency as they are able to achieve with Respondent's machines. In short, on this issue -- which both Petitioner and Respondent have recognized as critical to any meaningful analysis of the effects of the allegedly subsidized Canadian imports -- the important questions have simply not been resolved.

C. Investment and Employment

In this investigation, as in others, it is very difficult, if not impossible, to draw meaningful conclusions respecting the impact of the subject, allegedly subsidized, imports on the domestic industry based only on an examination of the financial and employment data compiled by the Commission. Many factors entirely unrelated to subsidization of these imports have inevitably influenced the performance of the industry during the period covered by our investigation. Among other things, for example, in this investigation, Petitioner alleges that there has been significant new demand for corrugated tubing in recent years.65/ Although the record suggests that Petitioner's estimate of the magnitude of this new

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64/ Id.

65/ See Petition at 18-19.

demand is, at best, questionable, it appears that significant new uses and markets for such tubing have, in fact, been recently developed, while other existing markets have declined.66/ For an industry that is so obviously in flux, the various measures of industry performance that we have collected cannot, if viewed in isolation, provide a very meaningful indication of the extent to which subsidization of the subject imports has affected the domestic industry.

That said, I note the industry recently [* *] after [* * * * *] in its 1986 and 1987 fiscal years.67/ Measured as a percentage of sales, Petitioner's operating income in its 1988 fiscal year was [* *].68/ During the third quarter of this calendar year, Petitioner's reported operating income, relative to net sales, was [*]. However, we have no financial data from Petitioner for the comparable period in calendar year 1988.69/ We have no way of knowing, in this preliminary investigation, whether the [* * *] level of profitability for this three-month period is representative, or whether it is instead a function of a temporary or seasonal anomaly.

The employment picture is similarly clouded. Petitioner's workforce is relatively small, and has remained essentially unchanged over the past two years (with a loss of [* * *]

66/ Report at A-15.

67/ Report at A-9, Table 3.

68/ Id.

69/ Id.

reported during the first nine months of the current year).70/ Total hours worked by this workforce followed an essentially similar pattern.71/ Relatively small, but regular, increases in both the total and hourly compensation paid to these workers were reported throughout the period covered by our investigation.

Accordingly, standing alone, the data on the domestic industry's overall financial and employment performance that we have been able to collect in this preliminary investigation do not provide a basis for any categorical statements respecting the performance of the domestic industry. They provide even less basis for any meaningful conclusions respecting the issue that we are charged with considering -- that is, whether subsidization of the subject imports caused material injury to that industry. Accordingly, in this investigation, my conclusion that there is a reasonable indication that subsidization of the subject imports has materially injured the domestic industry is predicated primarily on the other information before us suggesting that, as previously discussed, there is a reasonable possibility that subsidization of these products significantly affected prices and sales of the domestic like product.

CONCLUSION

For the foregoing reasons, I determine that a reasonable indication exists that an industry in the United States has been materially injured by reason of imports of plastic tubing corrugators

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70/ Id. at A-8, Table 2.

71/ Id.

from Canada. I therefore find it unnecessary to reach the question whether a reasonable indication of a threat of material injury to that industry exists, and make no determination on that issue.

INFORMATION OBTAINED IN THE INVESTIGATION

Introduction

On November 7, 1989, a petition was filed with the U.S. International Trade Commission and the U.S. Department of Commerce by Cullom Machine Tool & Die, Inc., Cleveland, TN, alleging that subsidized imports of plastic tubing corrugators and apparatus therefor (including mold sets, dies, and perforators) from Canada are being sold in the United States and that an industry in the United States is materially injured and threatened with material injury by reason of such imports. Accordingly, effective November 7, 1989, the Commission instituted countervailing duty investigation No. 701-TA-301 (Preliminary) under section 703(a) of the Tariff Act of 1930 (19 U.S.C. 1671b(a)) to determine whether there is a reasonable indication that an industry in the United States is materially injured or threatened with material injury, or the establishment of an industry in the United States is materially retarded, by reason of such imports.

Notice of the institution of the Commission's investigation and of a public conference to be held in connection therewith was given by posting copies of the notice in the office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the Federal Register on November 15, 1989 (54 F.R. 47583). [1] The public conference was held in Washington, DC, on November 28, 1989, [2] and the vote was held on December 19. Plastic tubing corrugators have not been the subject of any other investigation conducted by the Commission.

Nature and Extent of Alleged Subsidies

There is no information relating to the nature and extent of the alleged subsidies other than the allegations of the petitioner. The petitioner identified Corma, Inc., Concord, Ontario, as the sole Canadian manufacturer exporting to the United States. (There are no other firms in Canada that have produced plastic tubing corrugators to date; however, one other firm in Canada--Ashland-Taylor, Inc., Woodbridge, Ontario--indicates that, although it is not actively soliciting sales at this time, it has the capability to produce corrugators and has manufactured and sold apparatus for corrugators, including mold sets, dies, and perforators). With respect to the alleged subsidies, the petitioner cited various government programs in Canada--including tax credits, development loans, adjustment grants, export credit financing, and other benefits--that it believes have conferred subsidies on Corma's manufacture and export of the subject product. [3] The petitioner did

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[1] Copies of the Commission's and Commerce's notices instituting the investigation are shown in app. A.

[2] A list of witnesses appearing at the conference is presented in app. B.

[3] Each program on which Commerce initiated an investigation is identified in its notice of initiation of a countervailing duty investigation (app. A).

not estimate a total net subsidy rate for Corma nor for any of the individual programs from which the Canadian firm allegedly benefits.

The Product

Description and uses

The imported articles subject to the petitioner's complaint are plastic tubing corrugators (corrugators)--relatively large, individually powered machines designed to manufacture continuous lengths of corrugated plastic tubing--and apparatus therefor, including mold sets, dies, and perforators, each of which may be sold separately and/or in conjunction with the original machine.

Largely developed in Germany in the 1950's, corrugators were for many years limited to the production of relatively small sizes of tubing from certain plastics only. In recent years these machines have been developed to produce tubing ranging from one-eighth inch to 60 inches in diameter from a broad range of plastic materials. The uses for corrugated plastic tubing have expanded accordingly. Among its applications are hoses and ducts for buildings, appliances, automobiles, and other machinery; insulation and housing for pipe, wiring, and electrical cables; and conduits and culverts for sewage, land drainage, and farm irrigation.

Corrugators consist of a continuous track or tracks of molds running in a closed loop through the machine, running gear to move the track(s), a die to inject the plastic into the molds, a cooling system, a built-in power source (electric), a control panel, and an optional perforator. As the mold track enters the machine at one end (having returned from the other end in a closed loop), the die injects preheated plastic into the individual molds, which form and cool the tubing as they move through the machine, releasing it at the other end. Evenly spaced slits can be made in the tubing by means of a perforator attached to the end of the machine. Individual mold sets are capable of manufacturing a single tube size only. To produce other tube sizes additional mold sets are required. For this reason most corrugators allow for the removal and replacement of mold tracks. Together, the die, perforator (if desired), and mold set(s) can account for 50 percent or more of the value of the corrugator, depending on the number of mold sets purchased. Most corrugator manufacturers, including Cullom and Corma, produce corrugators in a number of sizes, each size, or model, limited to the size of the molds it can accommodate and thus the range of plastic tubing sizes it can produce.

The basic design and operational features of a corrugator, as well as the mold sets, dies, perforators, and other components therefor, are specific to the manufacturer and vary considerably from producer to producer. While, for example, Cullom's machines utilize a single track of molds (the molds opening and closing in clamshell fashion as they enter and exit the machine), Corma's machines utilize double tracks of molds (the molds, half on one track and half on the other, coming together as they enter the machine and separating as they exit--see appendix C for illustrations and company descriptions of these respective machines). Another distinction is in the method used to transfer molten plastic into the molds. The petitioner's

corrugators utilize a vacuum process, which it claims is more advanced than alternative blow-molding processes for virtually any application. Corma, on the other hand, offers machines with both processes, which it claims allows it to more readily accommodate the needs of individual buyers. Different makes of corrugators can differ in detail as well as basic design. Very few parts, if any, are interchangeable.

Differences in design and operation generally reflect the technical and marketing preferences of the manufacturer. From the buyer's point of view, however, there is usually an advantage or disadvantage for every design or operational characteristic, depending on the buyer's specific needs. For a manufacturer to serve as wide a market as possible, it must either develop standard machines that will serve a broad range of needs, or remain relatively flexible as to production capability. In any case the final product nearly always reflects the needs and preferences of both buyer and manufacturer. Actual production does not begin and sales are rarely, if ever, consummated until the specific needs of the customer have been addressed. Within the manufacturer's basic parameters, most machines sold have to some extent been adapted to the individual purchaser's specific needs and preferences. For the most part these needs and preferences are incorporated into the machine by the manufacturer during production. In some instances, however, after ordering and receiving a more basic machine from the manufacturer, purchasers have modified or otherwise adapted the corrugators for their own use themselves.

To date Corma has produced and delivered machines for a wider variety of end uses than have U.S. producers, i.e., its machines produce a broader range of tubing. While, for example, Corma has designed and delivered corrugators capable of manufacturing plastic tubing as small as one-eighth inch in diameter and others which produce such tubing as large as 34 inches in diameter, Cullom has produced and delivered corrugators which produce plastic tubing ranging from one-quarter inch to 24 inches in diameter. Existing Corma machines also produce tubing from a broader range of plastics. According to Cullom, however, there is no tubing in use today its machines cannot be designed and/or adapted to produce as well as or better than any other make of corrugator.

Corrugators account for the overwhelming bulk of corrugated plastic tubing produced throughout the world and are the only machines capable of producing this product in continuous lengths. Certain injecting molding and blow molding machines available on the market can produce tubing of similar, if not identical, design and quality, but only in predetermined lengths. The additional technology incorporated into the corrugator which allows it to produce continuous lengths of tubing adds significantly to the value and cost of the machine.

U.S. tariff treatment

Plastic tubing corrugators and mold sets, dies, and perforators therefor are provided for in subheadings 8477.30.00 (blow-molding machines) and 8477.40.00 (vacuum-molding machines) of the Harmonized Tariff Schedule of the United States (formerly items 678.3535 and 678.3545 of the Tariff Schedules of the United States), classifications which include all types of injection-molding

machinery in addition to corrugators. A special rate of duty of 3.1 percent is applicable to the subject imports from Canada in 1989 under the United States-Canada free-trade agreement (FTA). (Other products from Canada are dutiable at the column 1-general duty rate of 3.9 percent ad valorem). For 1990 the Canada FTA rate of duty is scheduled to be 2.3 percent.

U.S. Market and Channels of Distribution

Corrugators and apparatus therefor sold in the United States by U.S. and foreign producers are sold directly to end users--i.e., directly to producers of plastic tubing. Producers of plastic tubing generally specialize in the type of industry they serve--say, appliance, automotive/transportation, construction, electronic, farming, or medical--and thus in the type of tubing they manufacture. Together, the petitioner and Corma have identified over 100 firms in the United States which manufacture some type of plastic tubing by means of corrugators.

Traditionally, prospective purchasers of corrugators would solicit quotes from producers worldwide. The quote would generally include one or more mold sets, the die, and, depending of the end use, an optional perforator. In recent years, however, with the increasingly unfavorable exchange rate of the U.S. dollar vis-a-vis European currencies, purchasers have largely limited themselves to U.S. and Canadian sources. Purchasers that have been satisfied with prior products and service from a corrugator manufacturer will often return to that manufacturer for additional service or products without actually "shopping" for alternatives.

Most mold sets, dies, and perforators are sold by corrugator manufacturers in conjunction with the sale of a corrugator. There is, however, a significant aftermarket for these items, either as replacements or additional accessories. A manufacturer of plastic tubing, for example, may purchase a perforator or additional mold sets for its previously purchased corrugators to broaden its product line, or may purchase a die to replace one that is aging or defective. For the most part these are supplied by the manufacturer of the corresponding corrugator. Some corrugator manufacturers, however, make and sell certain quantities of these items, particularly mold sets, for makes of corrugators other than their own. In rare instances mold sets, dies, and/or perforators may have been supplied by machine tool establishments other than corrugator manufacturers, although no such instances are known.

U.S. Producers

Currently, the petitioner, with one location in Cleveland, TN, is the only firm in the United States actively manufacturing and marketing plastic tubing corrugators. Two other machine/tool manufacturers--Hawkeye Tool Co., Jesup, IA, and NRM (National Rubber Machine) Corp., Columbiana, OH--have specially designed and manufactured *** and *** corrugators, respectively, since January 1986 for the express needs of certain domestic purchasers. Neither Hawkeye nor NRM considers itself a corrugator manufacturer as such, but will work in conjunction with a prospective buyer to design and

manufacture a machine to meet the buyer's specific needs. In general, these needs are much less demanding and/or more esoteric than those requiring a Cullom or Corma machine. Accordingly, their corrugators are less productive and more specialized. To date, Hawkeye's machines have been limited to the production of farm irrigation tubing, and NRM's machines produce tubing less than 3 inches in diameter, used mostly for fiber optic insulation. In comparison with those made by Cullom and Corma, Hawkeye and NRM corrugators are small, slow, and simply constructed. On the other hand, they can be purchased for a lower initial investment than other more widely distributed makes. Two manufacturers of plastic tubing--Advanced Drainage Systems, Hamilton, OH, and Hancor, Inc., Findlay, OH--have produced a few corrugators for captive use, but not since 1985. There are very likely several other firms in the United States which have the resources and skills to produce corrugators. To date, however, their capacity remains unused for that purpose.

There are no known producers of mold sets, dies, and/or perforators for corrugators in the United States other than the firms noted above. Cullom, Hawkeye, and NRM have each manufactured and sold one or more of these items separately, but only Cullom has made such items for makes of corrugators other than its own. Both Advanced Drainage and Hancor have produced these items, but, like their corrugators, they have been for captive use only. Just as there are firms with potential to manufacture corrugators, so there are firms with potential to manufacture mold sets, dies, and perforators. In theory, virtually any machine shop could produce these items to order. In practice, however, this occurs only rarely, if at all. There are no firms other than corrugator manufacturers known to have supplied major components for corrugators in recent years.

U.S. Importers

*** firms, all U.S. manufacturers of one or more kinds of plastic tubing, have reportedly imported corrugators since 1985. ***.

Foreign Producers

In addition to Corma (and potentially Ashland-Taylor), there are a number of firms in Europe--at least four in Germany, two in Italy, and one in Holland--which actively produce and market corrugators. Most of these firms have exported one or more of these machines to the United States, but all prior to the period of investigation (January 1986-September 1989).

Other than Corma, Ashland-Taylor is the only foreign firm known to have supplied mold sets, dies, and/or perforators to the United States since 1985. Corma supplies these items solely for its own models of corrugators.

Consideration of the Alleged Material Injury

Most of the data in the following sections reflect the operations of Cullom only. Data for other producers are shown where available. Cullom accounted for about *** percent of the value of U.S.-produced corrugators shipped during January 1986-September 1989 and at least *** percent of the value of U.S.-produced mold sets, dies, and perforators sold separately in the same period.

U.S. production, capacity, capacity utilization, shipments, and inventories

The amount of time required to produce a given corrugator can vary from 3 months to nearly a year, depending on the size and complexity of the machine ordered and the kind and amount of accessories included. Any consideration of the "capacity" of a firm to produce corrugators, therefore, must be qualified accordingly. Taking into consideration the types of orders it has normally filled, and its existing work force, space, and equipment, Cullom estimates a practical capacity of about 12 machines per year for January 1986-September 1989. Accordingly, its capacity utilization increased from *** percent in 1986 to *** percent in 1988 before falling to *** percent in January-September 1989. *** about *** percent of its work force's and equipment's time is used for purposes unrelated to corrugators--primarily machine tooling for local industries.

U.S. producers' production and domestic shipments of corrugators and corrugator apparatus are shown in table 1. (The number of corrugators shipped in each period is equivalent to the number produced). *** corrugators were produced and shipped in the United States in 1986-88, *** (valued at ***) in 1986, *** (valued at ***) in 1987, and *** (valued at ***) in 1988. [4] Only *** units, valued at ***, were produced and shipped in January-September 1989, in comparison to *** in the corresponding period of the previous year. U.S. producers report no production losses due to employment-related problems, sourcing problems, transitions, power shortages, natural disasters, or any other unusual circumstances.

In contrast to the trend for corrugators, separate sales of mold sets, dies, and perforators increased, albeit irregularly, during the period for which data were collected. They also represent an increasing share of U.S. producers' corrugator-related sales. From *** percent of the value of total sales of the subject products in 1986, separate sales of these items increased to *** percent of total sales in 1988 and to *** percent of total sales in January-September 1989. Cullom accounts for the bulk of aftermarket production and sales of these items in the United States. Hawkeye reports that ***, and NRM reports ***. Advanced Drainage Systems and Hancor have produced a few corrugator accessories but for captive use only.

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[4] Differences in corrugator sizes and features can account for major differences in unit value.

Table 1
Corrugators and apparatus therefor: U.S. production and domestic shipments, 1986-88, January-September 1988, and January-September 1989

Item	1986	1987	1988	January-September— 1988	1989
	Quantity				
Corrugators 1/	***	***	***	***	***
Mold sets (not included above) 2/	***	***	***	***	***
Dies (not included above) 2/	***	***	***	***	***
Perforators (not included above)	***	***	***	***	***
	Value (1,000 dollars)				
Corrugators 1/	***	***	***	***	***
Mold sets (not included above) 2/	***	***	***	***	***
Dies (not included above) 2/	***	***	***	***	***
Perforators (not included above)	***	***	***	***	***
Total	***	***	***	***	***

1/ Includes Cullom (1986—***, valued at ***; 1987—***, valued at ***; 1988—***, valued at ***; Jan.-Sept. 1988—***, valued at ***; and Jan.-Sept. 1989—***, valued at ***); Hawkeye (1986—***, valued at ***; 1987—***, valued at ***; and 1988—***, valued at ***); and NRM (1987—***, valued at ***).
2/ The data are for Cullom only.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Overall, the total value of shipments of corrugators and apparatus therefor declined by *** percent from 1986 to 1988 and then increased by *** percent from January-September 1988 to January-September 1989 consequent to ***. There have been no reported U.S. exports of the subject products during the period for which data were collected--likewise, no inventories: corrugators and apparatus therefor are produced to order.

Employment

Workers' time in U.S. producers' plants may be allocated to tasks unrelated to the production of corrugators and apparatus therefor. Although U.S. producers other than Cullom have obviously used a part of their labor force from time to time for the production of the subject products, the share of their workers' time for this purpose relative to other purposes is small. In contrast, *** percent of Cullom's workers' time is devoted to corrugators and related apparatus. The average number of all production and related workers in Cullom's plant, shown in table 2, increased from *** in 1986 to *** in 1988 before falling slightly to *** in January-September 1989. Hours worked by and total compensation paid to these workers fluctuated similarly, while hourly compensation increased from an average of *** in 1986 to *** in January-September 1989.

Table 2
Average number of production and related workers in Cullom's establishment, and hours worked by and compensation paid to such workers, 1986-88, January-September 1988, and January-September 1989

Item	1986	1987	1988	January-September 1988	January-September 1989
Average number of production and related workers	***	***	***	***	***
Hours worked by production and related workers 1/	***	***	***	*** 2/	***
Total compensation paid to production and related workers	***	***	***	*** 2/	***
Hourly compensation paid to production and related workers	***	***	***	***	***

1/ Cullom's estimate based on its average hourly compensation per annum.
2/ 1988 prorated for January-September.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Financial experience of U.S. producers

Cullom provided usable financial data on its overall establishment operations only. The company does not maintain separate product cost records for its plastic tubing corrugators and/or related apparatus (mold sets, dies, and perforators). According to Cullom, corrugators and related apparatus account for about *** percent of its equipment's and workers' time. The remaining time is used to machine tool parts for other types of machinery.

Overall operations.--Data on Cullom's overall operations are shown in table 3. It should be noted that the data reported therein are in accordance with the company's fiscal year, i.e., 1986 is equivalent to the year ending June 30, 1987; 1987 is equivalent to the year ending June 30, 1988; and 1988 is equivalent to the year ending June 30, 1989. For this reason the data cannot be directly related to the value of the company's shipments shown elsewhere in the report.

In 1987 total establishment sales were ***, an increase of *** percent over 1986 sales of ***. Sales rose to *** in 1988, an increase of *** percent. ***.

An income-and-loss statement detailing Cullom's expense items is presented in table 4.

* * * * * * *

Table 3
Income-and-loss experience of Cullom on the overall operations of its establishment in which plastic tubing corrugators and related apparatus are produced, accounting years 1986-88 and interim periods ended Sept. 30, 1988, and Sept. 30, 1989 1/

Item	Fiscal-- 1986	1987	1988	July-September 1988 2/	1989
	Value (1,000 dollars)				
Net sales	***	***	***	***	***
Cost of goods sold 3/	***	***	***	***	***
Gross profit 3/	***	***	***	***	***
General, selling, and administrative expenses 3/	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Other income, net	***	***	***	***	***
Net income or (loss) before income taxes	***	***	***	***	***
Depreciation and amortization included above	***	***	***	***	***
Cash flow 4/	***	***	***	***	***
	Share of net sales (percent)				
Cost of goods sold 3/	***	***	***	***	***
Gross profit 3/	***	***	***	***	***
General, selling, and administrative expenses 3/	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***
Net income or (loss) before income taxes	***	***	***	***	***

1/ The company's fiscal year ends June 30; thus, income-and-loss data for the 1988 accounting year is for the period ending 6/30/89.
2/ Not available.
3/ Cost of goods sold and GS&A data for 1986-88 have been reclassified by ITC staff (refer to table 4).
4/ Cash flow is defined as net income or loss plus depreciation and amortization.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table 4
Income-and-loss experience of Cullom on the overall operations of its establishment in which plastic tubing corrugators and related apparatus are produced, by individual expense items, accounting years 1986-88

(In thousands of dollars)

Item	Fiscal-- 1986	1987	1988
*	*	*	*	*	*	*

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Investment in productive facilities.--Cullom's fixed assets consist of ***. The value of property, plant, and equipment for Cullom's establishment, the value of its total assets, and its return on total and fixed assets are shown in table 5.

Table 5
Value of property, plant, and equipment of Cullom's establishment, accounting years 1986-88 and interim periods ended Sept. 30, 1988, and Sept. 30, 1989

(In thousands of dollars)

Item	Fiscal-- 1986	1987	1988	July-September-- 1988	1989
Fixed assets:					
Original cost	***	***	***	***	***
Book value	***	***	***	***	***
Total assets 1/	***	***	***	***	***
Return on fixed assets (percent) 2/	***	***	***	***	***
Return on total assets (percent) 3/	***	***	***	***	***

1/ Defined as book value of fixed assets plus all other assets.
2/ Defined as operating income or loss divided by book value of fixed assets.
3/ Defined as operating income or loss divided by total assets.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Capital expenditures.--During the period for which data were collected, capital expenditures for Cullom's establishment were *** in fiscal 1986, *** in fiscal 1987, *** in fiscal 1988, and *** in July-September 1989. All such expenditures were for ***.

Research and development expenses.--Cullom's expenses for research and development for all products of its establishment relate to ***.

Capital and investment.--The Commission requested U.S. producers to describe any actual or potential negative effects of imports of plastic tubing corrugators from Canada on their firm's growth, investment, and ability to raise capital and whether the scale of capital investments undertaken has been influenced by the presence of imports of the subject product from Canada. Cullom's response is quoted below:

* * * * * * *

Consideration of the Alleged Threat of Material Injury

Section 771(7)(F)(i) of the Tariff Act of 1930 (19 U.S.C. 1677(7)(F)(i) provides that--

In determining whether an industry in the United States is threatened with material injury by reason of imports (or sales for importation) of any merchandise, the Commission shall consider, among other relevant factors [5]--

(I) If a subsidy is involved, such information as may be presented to it by the administering authority as to the nature of the subsidy (Particularly as to whether the subsidy is an export subsidy inconsistent with the Agreement),

(II) any increase in production capacity or existing unused capacity in the exporting country likely to result in a significant increase in imports of the merchandise to the United States,

(III) any rapid increase in United States market penetration and the likelihood that the penetration will increase to an injurious level,

(IV) the probability that imports of the merchandise will enter the United States at prices that will have a depressing or suppressing effect on domestic prices of the merchandise,

(V) any substantial increase in inventories of the merchandise in the United States,

(VI) the presence of underutilized capacity for producing the merchandise in the exporting country,

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[5] Section 771(7)(F)(ii) of the act (19 U.S.C. 1677(7)(F)(ii)) provides that "Any determination by the Commission under this title that an industry in the United States is threatened with material injury shall be made on the basis of evidence that the threat of material injury is real and that actual injury is imminent. Such a determination may not be made on the basis of mere conjecture or supposition."

(VII) any other demonstrable adverse trends that indicate the probability that the importation (or sale for importation) of the merchandise (whether or not it is actually being imported at the time) will be the cause of actual injury,

(VIII) the potential for product-shifting if production facilities owned or controlled by the foreign manufacturers, which can be used to produce products subject to investigation(s) under section 701 or 731 or to final orders under section 706 and 736, are also used to produce the merchandise under investigation,

(IX) in any investigation under this title which involves imports of both a raw agricultural product (within the meaning of paragraph (4)(E)(iv)) and any product processed from such raw agricultural product, the likelihood that there will be increased imports, by reason of product shifting, if there is an affirmative determination by the Commission under section 705(b)(1) or 735(b)(1) with respect to either the raw agricultural product or the precessed agricultural product (but not both), and,

(X) the actual and potential negative effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the like product.

Available information on the volume, U.S. market penetration, and pricing of imports of the subject merchandise (items (III) and (IV) above) is presented in the section entitled "Consideration of the Causal Relationship Between the Allegedly Subsidized Imports and the Alleged Material Injury"; and information on the effects of imports of the subject merchandise on U.S. producers' existing development and production efforts (item (X)) is presented on page A-11. Available information on U.S. inventories of the subject product (item (V)); foreign producers' operations, including the potential for "product-shifting" (items (II), (VI), (VIII), and (IX) above); and any other threat indicators, if applicable (item (VII) above), follows.

There are no inventories of Canadian-produced corrugators or apparatus therefor either in Canada or the United States. Corma and Ashland-Taylor, the only known producers of the subject products in Canada, only produce these items to order and ship directly to end users. Only Corma produces complete corrugators. It produced *** machines in 1986, *** machines in 1987, and *** in 1988 (table 6). (Because of considerable differences in lead times required to produce different machines, Corma could not estimate its "capacity" beyond what it had actually produced in 1986-88). *** machines were produced in January-September 1989, compared with *** machines in the corresponding period of 1988. ***. The United States' share of these exports, ***, as shown in table 6. Although both Corma and Ashland-Taylor have produced significant quantities of mold sets, dies, and/or perforators for aftermarket sales, it is believed that Corma accounts for ***. (Specific data for Ashland-Taylor are not available). The value of Corma's shipments of corrugators and apparatus therefor combined is shown in table 7. The trends indicated are similar to those for corrugators alone except that ***.

Table 6
Corrugators: Corma's production, domestic shipments, and exports, 1986-88, January-September 1988, and January-September 1989

Item	1986	1987	1988	January-September— 1988	1989
Production	***	***	***	***	***
Domestic shipments 1/	***	***	***	***	***
Exports to—					
United States	***	***	***	***	***
All other countries	***	***	***	***	***
Share of production that was exported (percent)	***	***	***	***	***
Share of total exports to—					
United States (percent)	***	***	***	***	***
All other countries (percent)	***	***	***	***	***

1/ Corma's estimate based on the number of orders in process.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table 7
Corrugators and apparatus therefor: Corma's shipments (in dollars), 1986-88, January-September 1988, and January-September 1989

Item	1986	1987	1988	January-September— 1988	1989
Domestic shipments 1/	***	***	***	***	***
Exports to—					
United States 1/	***	***	***	***	***
All other countries 1/	***	***	***	***	***
Total exports	***	***	***	***	***
Total shipments	***	***	***	***	***
Share of total shipments that was exported (percent)	***	***	***	***	***
Share of total exports to—					
United States (percent)	***	***	***	***	***
All other countries (percent)	***	***	***	***	***

1/ Corma's estimate based on the number of orders in process.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Consideration of the Causal Relationship Between the Allegedly Subsidized Imports and the Alleged Material Injury

Imports

Canada accounts for virtually all imports of corrugators and apparatus therefor into the United States since 1985. (One relatively small machine, valued at ***, is known to have been imported from Germany in 1987). As shown in table 8, imports of corrugators have declined both in terms of quantity and value since 1986. All but one of these machines were manufactured and shipped by Corma. Corma also manufactured the bulk of mold sets, dies, and perforators imported separately into the United States, although specific data for Ashland-Taylor are not available. As a share of the value of all subject product imports, imports of these items sold separately increased from an average of *** percent in 1986-88 to *** percent in January-September 1989. Despite the increase in separate sales of corrugator apparatus, the value of imports of all the subject products declined by *** percent from *** in 1986 to *** in 1988, and by *** percent from January-September 1988 to January-September 1989.

Table 8
Corrugators and apparatus therefor: U.S. imports, 1986-88, January-September 1988, and January-September 1989 1/

Item	1986	1987	1988	January-September 1988	January-September 1989
	Quantity				
Corrugators	***	***	***	***	***
Apparatus therefor sold separately	2/	2/	2/	2/	2/
	Value (1,000 dollars)				
Corrugators	***	***	***	***	***
Apparatus therefor sold separately—					
Mold sets	***	***	***	***	***
Dies	***	***	***	***	***
Perforators	***	***	***	***	***
Total apparatus	***	***	***	***	***
Grand total	***	***	***	***	***

1/ Imports are from Canada except where noted.
2/ Not available.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

U.S. consumption and market penetration

Data on U.S. consumption of corrugators and apparatus therefor, summarized in table 9, show that the number of new corrugators purchased in the United States declined from *** in 1986 to *** in 1988 and from *** in January-September 1988 to *** in January-September 1989. There is a corresponding decline in value from *** to *** and from *** to *** in the same

Table 9
Corrugators and apparatus therefor: Apparent U.S. consumption and ratio of imports to consumption, 1986-88, January-September 1988, and January-September 1989

(Quantity in number of units; value in 1,000 dollars)

Item	1986	1987	1988	January-September— 1988	1989
			Quantity		
Corrugators:					
Apparent U.S. consumption 1/...	***	***	***	***	***
Ratio (percent) of imports to consumption—					
For Canada.....	***	***	***	***	***
For all other countries.....	***	***	***	***	***
Total.....	***	***	***	***	***
			Value		
Corrugators:					
Apparent U.S. consumption 1/...	***	***	***	***	***
Ratio (percent) of imports to consumption—					
For Canada.....	***	***	***	***	***
For all other countries.....	***	***	***	***	***
Total.....	***	***	***	***	***
Apparatus therefor sold separately:					
Apparent U.S. consumption 1/...	***	***	***	***	***
Ratio (percent) of imports to consumption—					
For Canada.....	***	***	***	***	***
For all other countries.....	***	***	***	***	***
Total.....	***	***	***	***	***
Total:					
Apparent U.S. consumption 1/...	***	***	***	***	***
Ratio (percent) of imports to consumption—					
For Canada.....	***	***	***	***	***
For all other countries.....	***	***	***	***	***
Total.....	***	***	***	***	***

1/ Domestic shipments plus imports.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

periods, respectively. In contrast to corrugators, however, consumption of corrugator apparatus sold separately has increased, particularly in the last period for which data were collected. As a share of total consumption, consumption of these items increased from *** percent in 1986 to *** percent in January-September 1989. Notwithstanding this increase, the value of total consumption declined by *** percent from 1986 to 1988 and by *** percent from January-September 1988 to January-September 1989.

The reasons for this decline are not clear. Corrugator sales depend to a large extent on sales of corrugated plastic tubing, and both petitioner and respondent have stated that, although the use of plastic tubing in some sectors may have declined somewhat in recent periods, new uses and markets continue to be developed. It may well be that the increasing productivity of corrugators and their adaptability to different mold sizes have enabled them to keep pace with any increase in demand for plastic tubing, saving

prospective purchasers the need for additional machines. Certainly a large number of European machines purchased prior to 1986 are still in use. The apparent longevity of these machines and/or the ability of plastic tubing manufacturers to keep them in service may have resulted in less of a replacement market than corrugator producers have expected. The market for corrugators and plastic tubing is further discussed in the following section.

As a share of U.S. consumption, Canadian-produced corrugators declined from *** percent (in terms of quantity) in 1986 to *** percent in 1988 and then increased from *** percent in January-September 1988 to *** percent in January-September 1989. U.S. producers' share changed reciprocally. In terms of value, Canadian-produced corrugators increased their share of the U.S. market throughout the period for which data were collected, as shown in table 9. The opposite trend is evident for corrugator apparatus sold separately. Overall, in terms of value, imports from Canada increased from *** percent of consumption in 1986 to *** percent in 1988 and then declined from *** percent of consumption in January-September 1988 to *** percent in January-September 1989.

Prices

Demand for plastic tubing corrugators (PTCs) is derived from the demand for the plastic tubing products produced with these machines. [6] These tubing products include plastic tubes for drainage, automotive, medical, and appliance applications. Both the petitioner and respondent agree that the demand for plastic tubing has declined in drainage applications, the original market for this product, due primarily to the drought in 1988. [7] However, the demand for plastic tubing has expanded into new markets, including medical applications and small appliances such as vacuum cleaners and drain pipes.

There are two types of PTCs currently being sold in the United States market: blow-molding and vacuum-molding corrugation machines. Cullom, the petitioner and the major U.S. manufacturer of PTCs during the period of investigation, produces vacuum-molding machines, whereas Corma, the Canadian producer of PTCs, produces both types of machines. [8] Since 1986, Cullom has reported shipping *** vacuum-molding PTCs to the U.S. market and Corma has reported shipping *** blow-molding and *** vacuum-molding PTCs to the U.S.

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[6] There are no other known uses for PTCs.

[7] Corma, the Canadian producer, also believes that demand for PTCs for drainage applications has been influenced by the decline in housing starts and increases in highway construction, among other factors.

[8] At the conference, Heinrich Dickhut, President for Cullom, stated that Cullom had the capability to produce both types of PTCs, although it has produced only vacuum-molding corrugation machines.

market. [9] Purchasers contacted during the investigation reported that since PTCs have a long life expectancy, some for over 20 years, their purchases of PTCs are infrequent and irregular.

PTCs are sold on a per-unit basis and are priced according to whether the machine uses blow molding or vacuum molding and the specific machine model. Vacuum-molding PTCs are more expensive than blow-molding corrugators by approximately 10-20 percent [10] and PTC machine models that produce larger tubing are more expensive than those machines that produce smaller tubing. Additional tooling or options such as dies, mold blocks, perforators, and extruders, may also increase the price.

PTCs are sold f.o.b. factory by both the U.S. and Canadian producers. Sales terms are typically one-third down at time of order, one-third at time of delivery, and the remaining one-third in either 10 or 30 days. Transportation costs are considered minor by both U.S. and Canadian producers and by purchasers contacted during the investigation. [11] Order lead times are generally 3 to 7 months, although ***.

PTCs are usually made to individual customer specifications that may vary greatly from machine to machine. They are manufactured at time of order and are not sold through distributors or held in inventory, but are purchased by negotiated bids directly from the supplier. PTCs are sold through a closed-bid process, and often only one producer will be contacted to submit a quote. [12] ***.

Neither Cullom nor Corma have a public price list for their PTCs, although both have internal price lists. Corma reported that the U.S. price of its PTC is generally ***. Although discounts or special incentives typically are not given for sales of PTCs, ***. ***.

In general, the quote submitted and the actual purchase will include many options such as dies, mold blocks, perforators, extruders, and additional tooling to satisfy the customer's specifications. Therefore, the total quoted price for two sales of the same model PTC can be vastly different and individual sales by a company may not be comparable. In addition, the initial quotes may bear little resemblance to the final negotiated purchase price because each may include a different set of the available options. A further difficulty in the comparability of PTCs produced by Cullom and Corma involves

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[9] An additional *** blow-molding corrugation machines have been ordered from Corma but have not yet been shipped.

[10] Cullom reported that vacuum-molding PTCs have greater productivity and produce higher quality tubing than blow-molding PTCs.

[11] These costs are generally less than 2 percent of the overall cost of the PTC.

[12] A producer may wrongly assume that a competitor is bidding for the same sale.

the specific differences between the individual models manufactured by these two companies. One example of this difference is in the tubing production range of the various models of corrugators manufactured by these two companies. [13] Machines that have a narrower tubing production range have a limited capability and may not be directly comparable to those machines that allow a different range of tubing sizes.

Although both Cullom and Corma claim that they produce machines that have the capability to produce tubing in a large size range, neither company has machines that are currently producing tubing of the largest sizes. Cullom currently produces 4 models of PTCs that have a capability to produce pipe with an inner diameter (ID) size range of between 1/4 inch and 3 inches for its smallest machine and between 8 inches and 42 inches for its largest machine. Purchasers, however, have manufactured tubing only between 1/4 inch and 24 inches with these machines. Corma produces 11 machine models with standard variations for 8 of the models. Its smallest machine has the capability of producing tubing between approximately 1/8 inch and 5/8 inch ID whereas its largest machine has the capability of producing tubing with an ID of 60 inches. Purchasers, however, have manufactured tubing only between 1/8 inch and 34 inches with Corma's machines.

Cullom, Corma, and the U.S. purchasers contacted during the investigation reported that the lowest quote will not always win the contract because of the options and other considerations. ***. Purchasers contacted during the investigation reported that the factors they consider important include price, quality, the experience and reliability of the supplier, the PTC's technology, and its availability or delivery time.

Price quotes and trends.--The Commission requested U.S. and Canadian producers of PTCs to provide quote and pricing information for all quotes they made to U.S. purchasers between January 1986 and September 1989, including those quotes occurring before 1986 that resulted in a sale during the period of investigation and any sale awarded after September 1989. For each quote, information was requested for the initial quote, any final quote, and the actual sales price if the firm was awarded the sale. Purchasers also were requested to provide pricing information for all quotes that they received for purchases of PTCs during the period of investigation.

Both the U.S. producer, Cullom, and the Canadian producer, Corma, submitted nearly all of their written quotes for PTCs during the period of investigation. Both Cullom and Corma submitted to the Commission the invoices relating to each completed sale during the period. Additionally, Cullom submitted its written quotations for all quotes that did not result in a sale. Cullom reported *** quotes for PTCs to *** potential purchasers that resulted in *** sales. Corma reported *** quotes for PTCs to *** potential purchasers

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[13] See app. C for a more complete description of Cullom's and Corma's PTC models.

that resulted in *** sales. [14] Corma also submitted written quotations for *** of the remaining quotes that did not result in a sale. Both Corma and Cullom submitted their written quotations for instances when there was actual bid competition between the two companies. Six purchasers also reported information on their purchases of PTCs during the period of investigation. These purchasers bought *** during 1986-89.

PTC price quotes made by Cullom and Corma varied depending on the specific model of the machine quoted and options included in the bid. Often, the initial bids by both companies included multiple options, such as different size dies or molds, of which the purchaser would select only one. If the quote resulted in a sale, the final sales price would be substantially lower than the initial bid because of these modifications. In addition, the sales prices of the basic corrugator itself are not easily compared because both companies incorporate different standard options in the price of the machine. [15]

The price ranges quoted for the overall PTC package, the actual sales prices, and the individual corrugator prices *** (tables 10 and 11). During the period of investigation, the initial price quotes for the PTC package submitted by Cullom ranged between *** and *** for the smaller 123 machine and up to *** for the 842 machine. The range of prices resulting in actual sales of the PTC package were between *** and ***. The initial price quotes for the PTC package submitted by Corma ranged between *** and *** and the range of prices resulting in actual sales of the PTC package were between *** and ***. The quoted prices for Cullom's and *** Corma's corrugators with only the standard options ***. ***; however, there were some instances of options or additional tooling included in the final sale that were not listed in the initial quote.

Bid competition.--In comparing the quote and sales information supplied by the U.S. and Canadian producers, Cullom and Corma competed for sales to *** purchasers of PTCs (table 12). ***. The price quotations listed in table 12 are not directly comparable due to the differences between the two companies' corrugators and their option packages. Each of the purchasers stated that price was not the major factor in their purchasing decision. Purchasers reported buying both machines regardless of whether the price was higher or lower for a specific supplier. The bid competition between Cullom and Corma with these *** purchasers is discussed below.

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[14] Although Corma provided nearly all of its quotes during the period of investigation, due to time constraints it could provide complete price details on only *** of the *** quotes, including every quote that competed with a Cullom quote.

[15] See app. D for an example of a Cullom and Corma written quotation.

Table 10
Corrugators: Price ranges of initial quotes and sales by the U.S. producer (Cullom), by models, 1986-89 1/

Model number and year	Initial quotes 2/		Sales 2/ 3/		Corrugator value only
	Quantity	Value	Quantity	Value	
	Units	1,000 dollars per unit	Units	1,000 dollars per unit	1,000 dollars per unit
*	*	*	*	*	*	*

1/ The completed sale is presented in the year when the initial quote was given and not in the year of the actual shipment. For example, the sales price of a PTC quoted in 1986 but delivered in 1987 is recorded in 1986. In addition, sales of PTCs initially quoted in 1985 but delivered in 1986 are recorded in 1986.
2/ Including options.
3/ All corrugators sold were vacuum-molding machines.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table 11
Corrugators: Price ranges of initial quotes and sales by the Canadian producer (Corma), by models, 1986-89 1/

Model number and year	Initial quotes 2/		Sales 2/		Corrugator value only
	Quantity	Value	Quantity	Value	
	Units	1,000 dollars per unit	Units	1,000 dollars per unit	1,000 dollars per unit
*	*	*	*	*	*	*

1/ The completed sale is presented in the year when the initial quote was given and not in the year of the actual shipment. For example, the sales price of a PTC quoted in 1986 but delivered in 1987 is recorded in 1986. In addition, sales of PTCs initially quoted in 1985 but delivered in 1986 are recorded in 1986.
2/ Including options.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table 12
Corrugators: Bid competition between U.S. and Canadian producers, by purchaser, January 1986-September 1989

Purchaser, producer, country of origin, and model	Initial quote		Corrugator price	Date awarded	Sales price	Date shipped
	Date	Price				
*	*	*	*	*	*	*

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

.-- reported purchasing *** PTCs *** during the period of investigation. *** reported that it had purchased the *** machine because it was a vacuum-molding machine that could produce better quality tubing faster, it was an American-built machine, and it was competitive in price. *** stated that the Cullom machine was fractionally lower in price than the Corma machine but that this price difference was unimportant in its purchasing decision. He commented that the PTC price is relatively less significant than how the machine operates because *** can recoup the initial investment rather quickly from the annual output from a corrugator. *** estimated that the annual net sales from the plastic tubing output can be approximately 10 to 15 times the price of the initial investment.

* * * * * * *

.[16]-- reported purchasing *** PTCs *** during the period of investigation. *** stated that he has purchased only Corma machines since ***. In his opinion, the technology of Corma was superior to that of Cullom and this factor outweighed the fact that Corma's price was higher. *** also reported that the PTC's reliability, speed, and production quality were more important considerations than price in his purchasing decision.

.-- purchased a *** machine in ***. *** stated that although *** might have received quotes from other producers, there was actually little competition to Cullom. It purchased the Cullom machine because *** existing equipment was from Cullom. *** had purchased a *** PTC in *** and was very satisfied with it. He had purchased blow-molding machines *** and preferred vacuum-molding machines as newer technology.

.-- reported that it purchased a *** PTC in ***. *** stated that he purchased the Cullom product primarily because of his experience with Cullom. ***. *** purchased a vacuum-molding PTC to produce *** plastic

[16] *** was also cited in a lost sale allegation by Cullom involving *** amounting to *** in ***.

tubing. *** owns *** other corrugators purchased in the *** from a German manufacturer, ***.

.[17]-- reported that it purchased a *** corrugator in ***. *** reported *** that the purchase from Corma was not based solely on price, rather it was due to the flexibility of Corma's responsiveness as a manufacturer, its shorter lead time, and its PTC design.[18]

*** stated that although a significant difference in price existed between the PTC packages offered by the two companies, there were such major differences between the machines that it was like comparing apples and oranges. The Cullom machine was heavier, provided more non-optional features that *** did not need, required more maintenance, and was more expensive overall than the Corma machine.[19]

.[20]-- reported that it purchased a *** PTC in ***. *** stated that it purchased the Corma machine primarily because of Corma's experience, its quality, and reliability. In his opinion, Corma is an older and more established company than Cullom, and thereby safer. *** commented that prices offered by both companies for the PTC and the relevant options were very similar and competitive with each other, and did not play a major factor in *** purchasing decision. *** currently owns two other corrugators, both purchased from a U.S. manufacturer, ***, in the ***. *** also bid for the *** sale but did not receive the sale because it was not capable of providing one machine to serve the full range of plastic tubing sizes that *** wanted.

.-- reported purchasing *** PTCs in ***. *** stated that *** switched to Cullom because Cullom's PTCs were better built machines and the Cullom vacuum-molding corrugator can run faster at a higher output than Corma's blow-molding machines. *** also reported that the price of the Cullom corrugator was approximately *** percent below the price quoted for Corma's vacuum-molding PTC.

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[17] *** was cited in a lost sale allegation by Cullom involving *** amounting to *** in ***.

[18] The Corma machine weighs almost one-half as much as the Cullom machine and was easier to install in *** facilities.

[19] See app. D for the PTC quotations offered to *** by both Cullom and Corma.

[20] *** was cited in a lost sale allegation by Cullom involving *** amounting to *** in ***.

Exchange rates

Quarterly data reported by the International Monetary Fund indicate that during the period January 1986 through June 1989 the value of the Canadian dollar increased by 17.6 percent against the U.S. dollar (table 13). [21] Adjusted for relative movements in producer price indices in the United States and Canada, the real value of the Canadian currency appreciated 15.2 percent relative to the dollar from January-March 1986 through June 1989.

Lost sales/lost revenues

*** allegations of lost sales were supplied to the Commission by Cullom involving ***. [22] *** allegations involved lost sales of PTCs and are discussed in the section of this report entitled "Bid competition." The *** involved an aftermarket sale of *** and is discussed below. No allegations of lost revenues were reported.

*** was named by Cullom in a lost sale allegation involving *** and *** amounting to ***. *** remembered purchasing *** from Corma, but stated that he did not ask Cullom for a quote on these items. He basically orders only *** items from Cullom and only *** items from Corma. In his opinion, Cullom does not have the technology to produce quality ***.

*** commented that the factors *** considers important when purchasing corrugator parts include the technology and the experience of the producer in manufacturing the specific corrugator parts. Pricing is a secondary factor. *** does not want to assist any company in R&D efforts to develop a new product, and will often purchase items from established vendors. ***.

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[21] International Financial Statistics, November 1989.

[22] Cullom also reported in its questionnaire response an additional allegation of a lost sale to a *** producer of PTCs.

Table 13
U.S.-Canadian exchange rates: 1/ Nominal exchange rates of the Canadian dollar in U.S. dollars, real exchange-rate equivalents, and producer price indicators in the United States and Canada, 2/ indexed by quarters, January 1986-September 1989

Period	U.S. Producer Price Index	Canadian Producer Price Index	Nominal exchange rate index	Real exchange rate index
1986:				
January-March.....	100.0	100.0	100.0	100.0
April-June.....	98.2	98.5	101.4	101.8
July-September....	97.7	98.7	101.3	102.4
October-December..	98.1	99.4	101.4	102.8
1987:				
January-March.....	99.2	99.8	104.9	105.6
April-June.....	100.8	101.1	105.3	105.6
July-September....	101.9	102.6	106.2	106.8
October-December..	102.3	103.6	107.1	108.4
1988:				
January-March.....	102.9	103.9	110.8	111.8
April-June.....	104.8	105.2	114.1	114.6
July-September....	106.2	106.3	115.1	115.2
October-December..	106.7	107.2	116.4	116.9
1989:				
January-March.....	109.0	108.2	117.8	116.8
April-June.....	110.0	4/ 108.6	117.6	4/ 115.2
July-September....	110.4	5/	118.7	5/

1/ Exchange rates expressed in U.S. dollars per Canadian dollar.
2/ Producer price indicators--intended to measure final product prices--are based on average quarterly indices presented in line 63 of the International Financial Statistics.
3/ The indexed real exchange rate represents the nominal exchange rate adjusted for relative movements in producer price indices in the United States and Canada. Producer prices in the United States increased 10.0 percent during the period January 1986 through June 1989 compared with an 8.6-percent increase in Canadian prices during the same period.
4/ Based on April 1989.
5/ Not available.

Note.--January-March 1986=100.0.

Source: International Monetary Fund, International Financial Statistics, November 1989.

APPENDIX A

COMMERCE'S AND COMMISSION'S FEDERAL REGISTER NOTICES

[C-122-910]

Initiation of Countervailing Duty Investigation; Plastic Tubing Corrugators From Canada

AGENCY: Import Administration, International Trade Administration, Commerce.

ACTION: Notice.

SUMMARY: On the basis of a petition filed in proper form with the U.S. Department of Commerce, we are initiating a countervailing duty investigation to determine whether manufacturers, producers, or exporters in Canada of plastic tubing corrugators (PTCs), as described in the "Scope of Investigation" section of this notice, receive benefits which constitute subsidies within the meaning of the countervailing duty law. We are notifying the U.S. International Trade Commission (ITC) of this action so that it may determine whether imports of PTCs from Canada materially injure, or threaten material injury to, a U.S. industry. If this investigation proceeds normally, we will make our preliminary determination on or before January 31, 1990.

EFFECTIVE DATE: December 5, 1989.

FOR FURTHER INFORMATION CONTACT: Vincent Kane or Roy A. Malmrose, Office of Countervailing Investigations, Import Administration, International Trade Administration, U.S. Department of Commerce, 14th Street and Constitution Avenue, NW., Washington DC 20230; telephone (202) 377-2815 and (202) 377-5414.

SUPPLEMENTARY INFORMATION:

The Petition

On November 7, 1989, we received a petition in proper form from Cullom Machine Tool & Die, Inc. of Cleveland, Tennessee. This petition is filed on behalf of the U.S. industry producing PTCs. In compliance with the filing requirements of section 355.12 of the Commerce Department's regulations, published in the Federal Register on December 27, 1988 (53 FR 52306) (to be codified at 19 CFR 355.12), the petition alleges that producers and exporters of PTCs in Canada receive subsidies within the meaning of section 701 of the Tariff Act of 1930, as amended (the Act).

Since Canada is a "country under the Agreement" within the meaning of section 701(b) of the Act, Title VII of the Act applies to this investigation, and the ITC is required to determine whether imports of the subject merchandise from Canada materially injure, or threaten material injury to, a U.S. industry.

Petitioner has alleged that it has standing to file the petition. Specifically, petitioner has alleged that it is an interested party as defined under section 771(9)(C) of the Act and that it has filed the petition on behalf of the U.S. industry producing the product that is subject to this investigation. If any interested party as described under paragraphs (C), (D), (E), or (F) of section

771(9) of the Act wishes to register support of or opposition to this petition, please file written notification with the Commerce officials cited in the "For Further Information Contact" section of this notice.

Initiation of Investigation

Under section 702(c) of the Act, we must make the determination on whether to initiate a countervailing duty proceeding within 20 days after a petition is filed. Section 702(b) of the Act requires the Department to initiate a countervailing duty proceeding whenever an interested party files a petition, on behalf of an industry, that (1) alleges the elements necessary for the imposition of a duty under section 701(a) and (2) is accompanied by information reasonably available to the petitioner supporting the allegations. We have examined the petition on PTCs from Canada and have found that most of the programs alleged in the petition meet these requirements. Therefore, we are initiating a countervailing duty investigation to determine whether Canadian manufacturers, producers, or exporters of PTCs, as described in the "Scope of Investigation" section of this notice, receive subsidies. However, we are not initiating an investigation for certain programs because the petition filed to allege the elements necessary for the imposition of a duty or in some instances failed to provide the necessary supporting information. If our investigation proceeds normally, we will make our preliminary determination on or before January 31, 1990.

Scope of Investigation

The United States has developed a system of tariff classification based on the international harmonized system of Customs nomenclature. On January 1, 1989, the U.S. tariff schedules were fully converted to the Harmonized Tariff Schedule (HTS), as provided for in section 1201 *et seq.* of the Omnibus Trade and Competitiveness Act of 1988. All merchandise entered or withdrawn from warehouse for consumption on or after this date will be classified solely according to the appropriate HTS item number(s). The HTS item numbers are provided for convenience and U.S. Customs Service purposes. The written description remains dispositive.

The product covered by this investigation is plastic tubing corrugators (PTCs) which is defined as all machines and apparatus therefor (including mold sets, dies, and perforators, but excluding separately imported and/or free-standing extrusion machines) designed to manufacture continuous lengths of corrugated plastic tubing whether such machines and apparatus are imported as part of the systems or separately. These goods are described for tariff classification purposes as blow molding machines and vacuum molding machines and other thermoforming machines, all the foregoing used for working rubber or plastics or for the manufacture of products from these materials. PTCs are currently provided for under the following HTS subheadings: 8477.30.00.00 and 8477.40.00.00.

Allegations of Subsidies

Petitioner lists a number of practices by the Government of Canada and the provincial government of Ontario which allegedly confer subsidies on manufacturers, producers, or exporters of PTCs. We are initiating an investigation of the following programs:

A. Federal Programs

1. Export Credit Financing
2. Certain Investment Tax Credits
3. Regional Development Incentive Program and Industrial and Regional Development Program
4. Loans under the Enterprise Development Program
5. Program for Export Market Development
6. Community-Based Industrial Adjustment Program Grants

B. Joint Federal/Provincial Programs

1. General Development Agreements
2. Economic and Regional Development Agreements

C. Provincial Programs

1. Ontario Development Corporation Export Support Loans, Other Loans and Loan Guarantees
2. Provision of Electricity by Ontario Hydro to Corma

As noted above, section 702(b) of the Act requires the Department to initiate a countervailing duty proceeding whenever an interested party files a petition, on behalf of an industry, that (1) alleges the elements necessary for the imposition of a duty under section 701(a) and (2) is accompanied by information reasonably available to the petitioner supporting the allegations. We are not initiating an investigation of the programs listed below because the supporting documentation required by section 702(b) was not provided in the petition.

1. Federal Expansion and Development/ Northern Ontario (FEDNOR)

Petitioner alleges that a countervailable benefit is conferred on Canadian manufacturers, producers, and exporters of PTCs in the form of loan insurance and grants covering up to 35 percent of eligible capital costs over a five-year period. Since petitioner has provided no evidence that Corma is eligible to receive benefits contingent upon location in northern Ontario, we are not initiating an investigation on this program.

2. Equity Infusions, Grants, Loans, and Loan Guarantees

Petitioner alleges that the federal government of Canada and the provincial government of Ontario have provided capital to Corma, Inc., on terms inconsistent with commercial considerations and that Corma, Inc., is unequityworthy. Petitioner has also alleged the government provision of grants, loans, and loan guarantees in addition to those specified above. Petitioner, however, has provided no evidence or documentation in support of these allegations. Since we deem such evidence necessary to initiate on the above allegations, we are not initiating an investigation on these allegations.

Allegation of Critical Circumstances

Petitioner alleges that critical circumstances exist with respect to imports of PTCs from Canada. Petitioner claims that the products concerned benefit from export subsidies that are inconsistent with the Agreement on Interpretation and Application of Articles VI, XVI, and XXIII of the General Agreement on Tariffs and Trade, and that imports have been massive over a relatively short period of time. We will determine whether critical circumstances exist with respect to these imports in our preliminary and final determinations.

Notification of ITC

In accordance with section 702(d) of the Act, we will notify the ITC and make available to it all non-privileged and non-proprietary information in our files, provided it confirms that it will not disclose such information, either publicly or under administrative protective order, without the written consent of the Deputy Assistant Secretary for Investigations.

Preliminary Determination by ITC

The ITC will determine by December 23, 1989, whether there is a reasonable indication that imports of PTCs materially injure, or threaten material injury to, a U.S. industry. If its determination is negative, this investigation will terminate; otherwise, this investigation will continue according to the statutory procedures.

This notice is published pursuant to section 702(c)(2) of the Act.

Dated: November 27, 1989.

Eric I. Garfinkel,

Assistant Secretary for Import Administration.

[FR Doc. 89-28348 Filed 12-4-89; 8:45 am]

BILLING CODE 3510-DS-M

[Investigation No. 701-TA-301; Preliminary]

Plastic Tubing Corrugators From Canada

AGENCY: United States International Trade Commission.

ACTION: Institution of a preliminary countervailing duty investigation and scheduling of a conference to be held in connection with the investigation.

SUMMARY: The Commission hereby gives notice of the institution of preliminary countervailing duty investigation No. 701-TA-301 (Preliminary) under section 703(a) of the Tariff Act of 1930 (19 U.S.C. 1671b(a)) to determine whether there is a reasonable indication that an industry in the United States is materially injured, or is threatened with material injury, or the establishment of an industry in the United States is materially retarded, by reason of imports from Canada of plastic tubing corrugators,[1] provided for in subheadings 8477.30.00 and 8477.40.00 of the Harmonized Tariff Schedule of the United States (previously reported under items 678.3535 and 678.3545 of the former Tariff Schedules of the United States), that are alleged to be subsidized by the Government of Canada. As provided in section 703(a), the Commission must complete preliminary countervailing duty investigations in 45 days, or in this case by December 22, 1989.

For further information concerning the conduct of this investigation and rules of general application, consult the Commission's Rules of Practice and Procedure, part 207, subparts A and B (19 CFR part 207, as amended by 53 FR 33039 (Aug. 29, 1988) and 54 FR 5220 (Feb. 2, 1989)), and part 201, subparts A through E (19 CFR part 201).

EFFECTIVE DATE: November 7, 1989.

FOR FURTHER INFORMATION CONTACT: Larry E. Reavis (202-252-1185), Office of Investigations, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436. Hearing-impaired individuals are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on 202-252-

[1] For purposes of this investigation, "plastic tubing corrugators" (PTCs) refers to all machines and apparatus therefor (including mold sets, dies, and perforators) designed to manufacture continuous lengths of corrugated plastic tubing. Such goods are described for tariff classification purposes as blow-molding machines (HTS subheading 8477.30.00) and vacuum-molding machines and other thermoforming machines (HTS subheading 8477.40.00), all the foregoing for working rubber or plastics or for the manufacture of products from these materials.

1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202-252-1000.

SUPPLEMENTARY INFORMATION:

Background

This investigation is being instituted in response to a petition filed on November 7, 1989, by Cullom Machine Tool & Die, Inc., Cleveland, TN.

Participation in the Investigation

Persons wishing to participate in the investigation as parties must file an entry of appearance with the Secretary to the Commission, as provided in § 201.11 of the Commission's rules (19 CFR 201.11), not later than seven (7) days after publication of this notice in the Federal Register. Any entry of appearance filed after this date will be referred to the Chairman, who will determine whether to accept the late entry for good cause shown by the person desiring to file the entry.

Public Service List

Pursuant to § 201.11(d) of the Commission's rules (19 CFR 201.11(d)), the Secretary will prepare a public service list containing the names and addresses of all persons, or their respresentatives, who are parties to this investigation upon the expiration of the period for filing entries of appearance. In accordance with § 201.16(c) and 207.3 of the rules (19 CFR 201.16(c) and 207.3), each public document filed by a party to the investigation must be served on all other parties to the investigation (as identified by the public service list), and a certificate of service must accompany the document. The Secretary will not accept a document for filing without a certifcate of service.

Limited Disclosure of Business Proprietary Information Under a Protective Order and Business Proprietary Information Service List

Pursuant to section 207.7(a) of the Commission's rules (19 CFR 207.7(a), as amended), the Secretary will make available business proprietary information gathered in this preliminary investigation to authorized applicants under a protective order, provided that the application be made not later than seven (7) days after the publication of this notice in the Federal Register. A separate service list will be maintained by the Secretary for those parties authorized to receive business proprietary information under a protective order. The Secretary will not accept any submission by parties containing business proprietary information without a certificate of service indicating that it has been served on all the parties that are authorized to receive such information under a protective order.

Conference

The Commission's Director of Operations has scheduled a conference in connection with this investigation for 9:30 a.m. on November 28, 1989, at the U.S. International Trade Commission Building, 500 E Street SW., Washington, DC. Parties wishing to participate in the conference should contact Larry Reavis (202-252-1185) not later than November 27 to arrange for their appearance. Parties in support of the imposition of countervailing duties in this investigation and parties in opposition to the imposition of such duties will each be collectively allocated one hour within which to make an oral presentation at the conference.

Written Submissions

Any person may submit to the Commission on or before December 1, 1989, a written brief containing information and arguments pertinent to the subject matter of the invsetigation, as provided in § 207.15 of the Commission's rules (19 CFR 207.15). A signed original and fourteen (14) copies of each submission must be filed with the Secretary to the Commission in accordance with § 201.8 of the rules (19 CFR 201.8). All written submissions except for business proprietary data will be available for public inspection during regular business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary to the Commission.

Any information for which business proprietary treatment is desired must be submitted separately. The envelope and all pages of such submissions must be clearly labeled "Business Proprietary Information." Business proprietary submissions and requests for business proprietary treatment must conform with the requirements of § 201.6 and 207.7 of the Commission's rules (19 CFR 201.6 and 207.7, as amended).

Parties which obtain disclosure of business proprietary information pursuant to § 207.7(a) of the Commission's rules (19 CFR 207.7(a), as amended) may comment on such information in their written brief, and may also file additional written comments on such information no later than December 6, 1989. Such additional comments must be limited to comments on business proprietary information received in or after the written briefs.

Authority: This investigation is being conducted under authority of the Tariff Act of 1930, title VII. This notice is published pursuant to § 207.12 of the Commission's rules (19 CFR 207.12).

By order of the Commission.

Issued: November 9, 1989.

Kenneth R. Mason,

Secretary.

[FR Doc. 89-26799 Filed 11-14-89; 8:45 a

BILLING CODE 7020-02-M

APPENDIX B

LIST OF WITNESSES AT THE COMMISSION'S CONFERENCE

CALENDAR OF PUBLIC CONFERENCE

Those listed below appeared as witnesses at the
United States International Trade Commission's conference:

Subject: Plastic Tubing Corrugators from Canada

Inv. No. 701-TA-301 (Preliminary)

Date and time: November 28, 1989 - 9:30a.m.

Sessions were held in connection with the investigation in ALJ room B of the U.S. International Trade Commission, 500 E Street SW, Washington, DC.

In support of the imposition of countervailing duties

William P. Alexander--Counsel
Brentwood, TN
on behalf of

Cullom Machine Tool & Die, Inc. Cleveland, TN

Heinrich B. Dickhut, President

In opposition to the imposition of countervailing duties

Weil, Gotshal & Manges--Counsel
Washington, DC
on behalf of

Corma, Inc., Toronto, Canada

Manfried Lupke, Chairman

Eric P. Salonen)--OF COUNSEL
M. Jean Anderson)--OF COUNSEL

APPENDIX C

ILLUSTRATIONS AND COMPANY DESCRIPTIONS OF CULLOM AND CORMA CORRUGATORS AND APPARATUS THEREFOR

EXHIBIT 1

DESCRIPTIONS OF CORMA CORRUGATORS

Model No.	Description
052	Produces plastic corrugated pipe from 0.125 - 0.626 inches in outer diameter. Maximum line speed of 130 feet per minute and maximum output of 66 pounds of corrugated plastic tubing per hour.[1] Typically sold to manufacturers of plastic corrugated pipe for automotive uses. Corma produces this model for both blow molding and vacuum forming production methods.
120, 120HS, 120HSL[2]	Produces plastic corrugated pipe from 0.250 - 2.5 inches in outer diameter. Maximum line speed of 130 feet per minute and maximum output of 470 pounds per minute. Typically sold to manufacturers of plastic corrugated pipe for automotive and medical uses. Corma produces this model for both blow molding and vacuum forming production methods. For additional information, see attached specification sheet for 120, 120HS and 120HSL corrugator, which includes a description of options that are available with this model.[3]

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1. Line speeds and outputs depend on a variety of factors, including: pipe diameter, type of plastic, cooling options, temperature and quantity of cooling water, and profile configuration.

2. "HS" and "HSL" indicate variations in size and performance in the model. See attached specification sheets for additional information.

3. Corma has attached all available specification sheets. Specification sheets are not available for all models.

420, 420HS, 420 HSL	Produces plastic corrugated pipe from 1.5 to 5.0 inches in outer diameter. Maximum line speed of 115 feet per minute and maximum output of 1100 pounds per minute. Typically sold to manufacturers of corrugated plastic tubing for drainage and appliances (e.g., vacuum cleaner hoses). Corma produces this model for both blow molding and vacuum forming production methods. For additional information, see attached specification sheet for 420 and 420HS corrugator, which includes a description of options that are available with this model.
620, 620HS, 620HSL	Produces plastic corrugated pipe from 2 to 8 inches in outer diameter. Maximum line speed of 100 feet per minute and maximum output of 1750 pounds per hour. Typically sold to manufacturers of corrugated plastic tubing for drainage. Corma produces this model for both blow molding and vacuum forming production methods. For additional information, see attached specification sheet for 620 and 620HS corrugators, which includes a description of options that are available with this model.
820, 820HS, 820HSL	Produces plastic corrugated pipe from 2 to 10 inches in outer diameter. Maximum line speed of 100 feet per minute and maximum output of 1750 pounds per hour. Typically sold to manufacturers of corrugated plastic tubing for drainage. Corma produces this model for both blow molding and vacuum forming production methods. For additional information, see attached specification sheet for 820 and 820HS corrugators, which includes a description of options that are available with this model.
1220, 1220HS	Produces plastic corrugated pipe from 2 to 15 inches in outer diameter. Maximum line speed of 100 feet per minute and maximum output of 1720 pounds per hour.

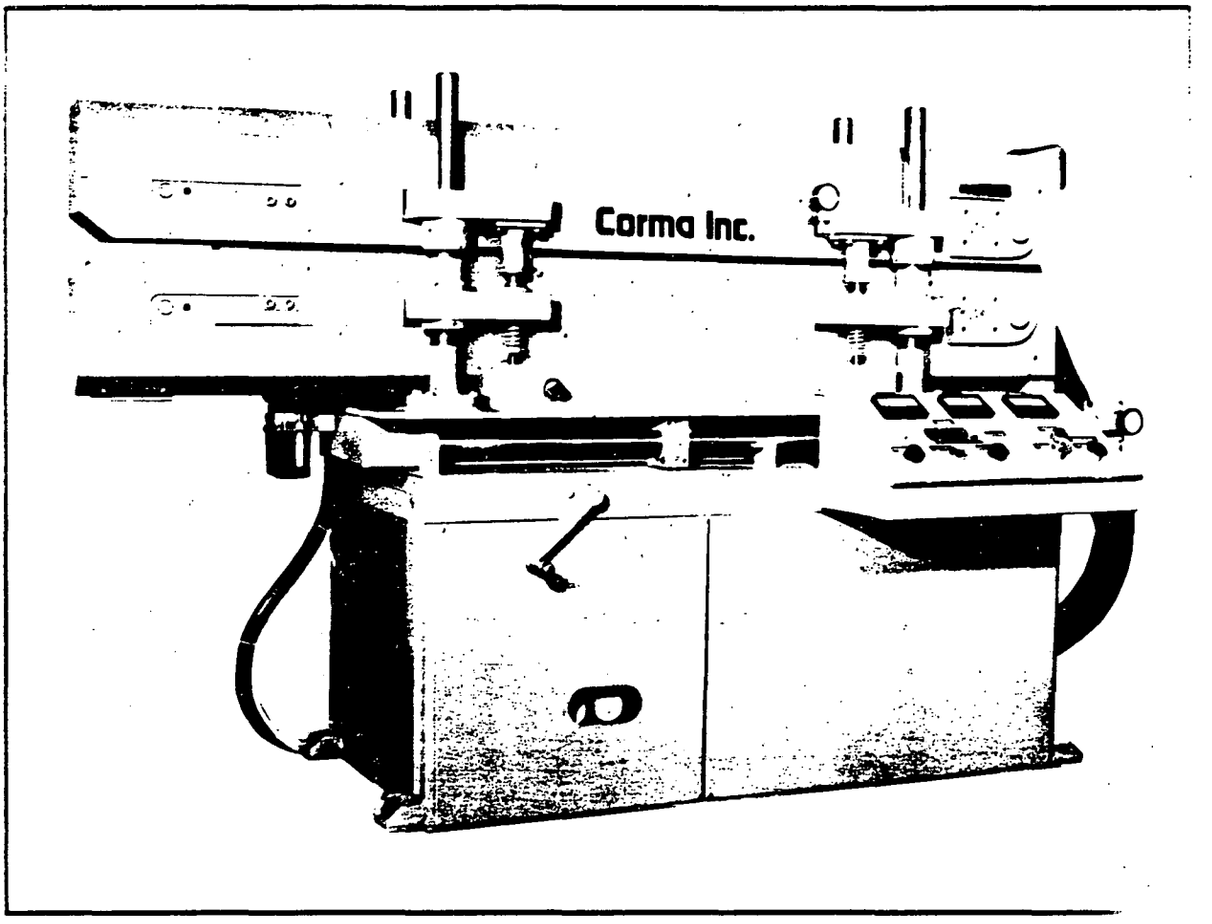
	Typically sold to manufacturers of corrugated plastic tubing for drainage. Corma produces this model for both blow molding and vacuum forming production methods.
1520, 1520HS	Produces plastic corrugated pipe from 2 to 18 inches in outer diameter. Maximum line speed of 100 feet per minute and maximum output of 1720 pounds per hour. Typically sold to manufacturers of corrugated plastic tubing for drainage. Corma produces this model for both blow molding and vacuum forming production methods.
2020, 2020HS	Produces plastic corrugated pipe from 4 to 26 inches in outer diameter. Maximum line speed of 100 feet per minute and maximum output of 2650 pounds per hour. Typically sold to manufacturers of corrugated plastic tubing for drainage. Corma produces this model for both blow molding and vacuum forming production methods as well as a combination blow molding and vacuum forming production method for larger pipe sizes. For additional information, see attached specification sheet for 2020 corrugators, which includes a description of options that are available with this model.
3020, 3020HS	Produces plastic corrugated pipe from 4 to 35 inches in outer diameter. Maximum line speed of 100 feet per minute and maximum output of 2860 pounds per hour. Typically sold to manufacturers of corrugated plastic tubing for drainage. Corma produces this model for both blow molding and vacuum forming production methods as well as a combination blow molding and vacuum forming production method for larger pipe sizes. For additional information, see attached specification sheet for 3020 corrugators, which includes a description of options that are available with this model.

5020	Produces plastic corrugated pipe from 10 to 50 inches in outer diameter. Maximum line speed of 26 feet per minute and maximum output of 3300 pounds per hour. Typically sold to manufacturers of corrugated plastic tubing for drainage. Corma produces this model for both blow molding and vacuum forming production methods as well as a combination blow molding and vacuum forming production method for larger pipe sizes.
6020	Produces plastic corrugated pipe from __ to 60 inches in outer diamter. Maximum line speed of __ feet per minute and maximum output of ____ pounds per hour. Typically sold to manufacturers of corrugated plastic tubing for drainage. Corma produces this model for both blow molding and vacuum forming production methods as well as a combination blow molding and vacuum forming production method for larger pipe sizes.

Corma Corrugator

Model
A-38
120 / 120 HS / 120 HSL

For tubing sizes:
0.25 in. I.D. to 2.5 in. O.D.
(6 mm I.D. to 65 mm O.D.)



The model 120 corrugator is mounted on two base plates in which height and sideways adjustments are incorporated.

The corrugator housings are built on a platform which is held to the corrugator base using guide bushings. This arrangement is advantageous as the corrugator cannot fall off the track, and it lets the machine slide on the guide shafts back and forth rather than rolling on wheels, which have the tendency to climb the rails, and bring the corrugator out of alignment with the extruder die.

The top housing is held in precise alignment by four solid columns and bushings. All drive sprockets are permanently engaged even when the top housing is lifted by the optional lifting system. The lifting system allows for easy maintenance, line-up, etc.

In the molding section, the molds are pressed together by extra spring loaded guides.

An automatic and adjustable pressurized lubrication system, complete with low level indicator and pressure gauge is standard. A measured amount of oil is fed to all required lubrication points.

The welded steel base houses the cooling fan, in front of which a radiator is installed. The corrugator housings are equipped with cooling pipes for intense water cooling. Both can either be hooked up to the customer's water supply or the optional heavy duty water cooling unit.

A complete electrical panel built to the specified current is part of the machine. The operating station has digital readout for production speed, supply volts, amps draw and total production. The electrical panel, when the extruder is wired in, has an interlock provision which stops the extruder if the corrugator should stop for any reason. This device monitors the actual moldblock movement.

The corrugator moldblocks are driven by a variable speed DC drive.

One set of moldblock carrier bases are installed.

Before leaving the Corma factory, the corrugator is put test run and all functions are checked.

A **two year warranty** covers the corrugator except for components bought by Corma. For these components the manufacturer's warranty applies.

Options

1) Heavy duty air chilling unit for moldblock cooling. This is a complete chilling unit, installed in the corrugator base. The standard radiator is replaced by an evaporator.
2) Heavy duty water cooling unit. This supplies cold water to the radiator on the fan and to the corrugator housings.
3) Pipe aftercooler with water atomizer.
4) Pipe aftercooler c/w water reservoir, recirculating pump and spray nozzles, dry-off fan and haul-off connected to the corrugator for precise haul-off speed. The sheetmetal used is stainless steel. The electric controls, incorporated in the main corrugator panel, are activated from the corrugator control station. The complete unit, built on four casters, rolls back and forth together with the corrugator to which it is connected.
5) Internal pipe cooling system for pipe from 1 inch I.D. and up. This feature is especially advantageous for slow setting plastics. It increases production speed as it reduces or even eliminates the resoftening of the pipe after it has left the corrugator.
6) Automatic temperature control valve. This regulates the temperature of the corrugator housings, and shuts down the waterflow, if no cooling is required. (Not required if option 2 is bought)
7) Isolation and step-down transformer. This option protects the DC drive by acting as a filter in locations where voltage spikes and interference from other equipment is found.
8) Manually operated lifting mechanism to lift the top housing. This feature simplifies the lining up of the extruder die with the moldblocks and if a power interruption should occur, the corrugator can simply be opened up and cleaned out. No tools are required and production time is not wasted.
9) Electrically operated lifting mechanism, instead of manually operated lifting mechanism.
10) Common base for the extruder and corrugator, complete with a swivel base for the extruder, which allows for easy and quick access to the extruder screw for cleaning or screw removal. Another very important benefit is that it ensures a very good and secure line-up of the two machines.
11) Variable moldblock track length. This feature allows for a specific hose length to be produced without having to throw away extra product at every track revolution.
12) Digital temperature indicator complete with six station selector switch.
13) Special modifications to the corrugator can be made and will be quoted on request.

Specifications	Model 120		Model 120 HS		Model 120 HSL	
Pipe range Min. I.D.	.25 in.	6 mm	.25 in.	6 mm	.25 in.	6 mm
Pipe range Max. O.D.	2.5 in.	65 mm	2.5 in.	65 mm	2.5 in.	65 mm
Max. line speed*	130 ft/min	40 m/min	130 ft/min	40 m/min	130 ft/min	40 m/min
Max. output*	240 lbs/hr	110 kg/hr	350 lbs/hr	160 kg/hr	470 lbs/hr	215 kg/hr
Set of moldblocks	60 pairs	60 pairs	80 pairs	80 pairs	120 pairs	120 pairs
Moldblock length	2 in.	50.8 mm	2 in.	50.8 mm	2 in.	50.8 mm
Moldblock chain length	120 in.	3050 mm	160 in.	4065 mm	240 in.	6100 mm
Forming section length	45 in.	1140 mm	65 in.	1650 mm	105 in.	2665 mm
Corrugator drive motor	3 hp	2.2 kw	3 hp	2.2 kw	5 hp	3.7 kw
Isolation transformer	5 kva	5 kva	5 kva	5 kva	7.5 kva	7.5 kva
Mold cooling fan	2.2 hp	1.7 kw	2.2 hp	1.7 kw	2.2 hp	1.7 kw
Corrugator lifter motor	.5 hp	.37 kw	.5 hp	.37 kw	.5 hp	.37 kw
Dimensions						
Centre height	45¼ in.	1150 mm	45¼ in.	1150 mm	45 ¼ in.	1150 mm
Length	70 in.	1780 mm	90 in.	2285 mm	110 in.	2795 mm
Width	60 in.	1525 mm	60 in.	1525 mm	60 in.	1525 mm
Machine Heights						
Smallest mold closed	59 in.	1500 mm	59 in.	1500 mm	59 in.	1500 mm
Smallest mold opened	63 in.	1600 mm	63 in.	1600 mm	63 in.	1600 mm
Largest mold closed	60 in.	1525 mm	60 in.	1525 mm	60 in.	1525 mm
Largest mold opened	63 in.	1600 mm	63 in.	1600 mm	63 in.	1600 mm
Weight, approx.	3744 lbs	1700 kg	4515 lbs	2050 kg	5308 lbs	2410 kg
Water Chilling Unit						
Chilling unit compressor	3 hp	2.2 kw	3 hp	2.2 kw	5 hp	3.7 kw
Circulating pump	1.5 hp	1.1 kw	1.5 hp	1.1 kw	1.5 hp	1.1 kw

*Line speeds and outputs are theoretical and depend upon type of plastic processed, pipe size, profile configuration and cooling water at 6°C or Corma's water chilling unit.

Note: Corma reserves the right to change specifications in the interest of progress without prior notice.

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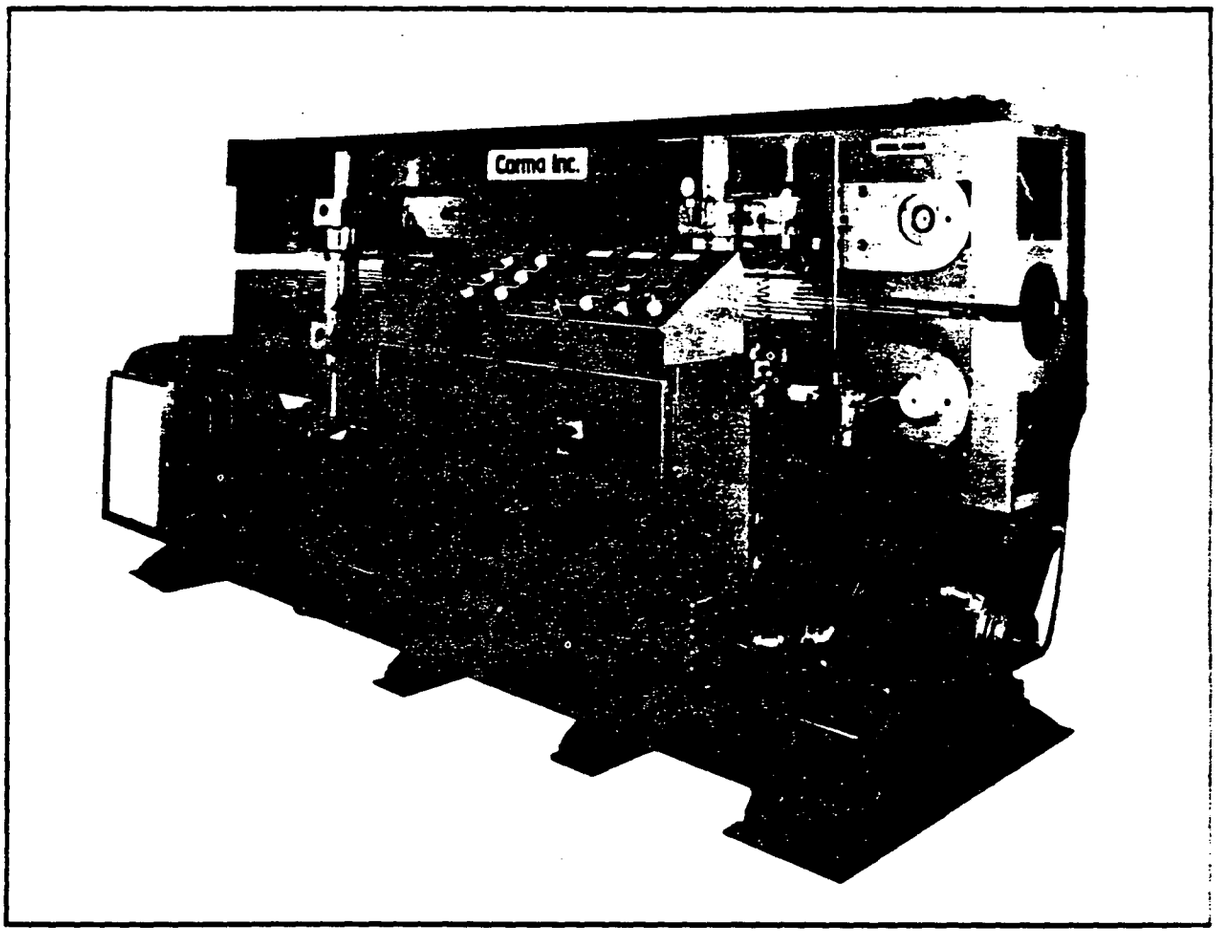
Printed in Canada

Corma Corrugator

Model
A-40 **420 / 420 HS**

For tubing sizes:
1.5 in. I.D. to 5 in. O.D.
(38 mm I.D. to 130 mm O.D.)



The model 420 corrugator is mounted on two base plates in which height and sideways adjustments are incorporated.

The corrugator housings are built on a base frame which is held to the corrugator base using guide bushings. This arrangement is advantageous as the corrugator cannot fall off the track, and it lets the machine slide on the guide shafts back and forth rather than rolling on wheels, which have the tendency to climb the rails, and bring the corrugator out of alignment with the extruder die.

The top housing is held in precise alignment by four solid columns and bushings. All drive sprockets are permanently engaged even when the top housing is lifted by the optional lifting system. The lifting system allows for easy maintenance, line-up, etc.

In the molding section, the molds are pressed together by extra spring loaded guides.

An automatic and adjustable pressurized lubrication system, complete with low level indicator and pressure gauge is standard. A measured amount of oil is fed to all required lubrication points.

On the welded steel base there are two cooling fans, in front of which radiators are installed. The corrugator housings are equipped with cooling pipes for intense water cooling. Both can either be hooked up to the customer's water supply or the optional heavy duty water cooling unit.

A complete electrical panel built to the specified current is part of the machine. The operating station has digital readout for production speed, supply volts, amps drawn and total production. The electrical panel, when the extruder is wired in, has an interlock provision which stops the extruder if the corrugator should stop for any reason. This device monitors the actual moldblock movement.

The corrugator moldblocks are driven by a variable speed DC drive.

One set of moldblock carrier bases are installed.

Before leaving the Corma factory, the corrugator is dry test run and all functions are checked.

A **two year warranty** covers the corrugator except for components bought by Corma. For these components the manufacturer's warranty applies.

Options

1) Heavy duty air chilling unit for moldblock cooling. This is a complete chilling unit, installed in the corrugator base. The standard radiators are replaced by evaporators.
2) Heavy duty water cooling unit. This supplies cold water to the radiators on the fans and to the corrugator housings.
3) Pipe aftercooler c/w water reservoir, recirculating pump and spray nozzles, dry-off fan and haul-off connected to the corrugator for precise haul-off speed. The sheetmetal used is stainless steel. The electric controls, incorporated in the main corrugator panel, are activated from the corrugator control station. The complete unit, built on four casters, rolls back and forth together with the corrugator to which it is connected.
4) Internal pipe cooling system. This feature is especially advantageous for slow setting plastics. It increases production speed as it reduces or even eliminates the resoftening of the pipe after it has left the corrugator.
5) Two automatic temperature control valves which regulate the temperature of the corrugator housings, and shut down the waterflow, if no cooling is required. (Not required if option 2 is bought)
6) Isolation and step-down transformer. This option protects the DC drive by acting as a filter in locations where voltage spikes and interference from other equipment is found.
7) Electrically operated lifting mechanism to lift the top housing. This feature simplifies the lining up of the extruder die with the moldblocks and if a power interruption should occur, the corrugator can simply be opened up and cleaned out. No tools are required and production time is not wasted.
8) Variable moldblock track length. This feature allows for a specific hose length to be produced without having to throw away extra product at every track revolution.
9) Digital temperature indicator complete with six station selector switch.
10) Special modifications to the corrugator can be made and will be quoted on request.

Specifications	Model 420		Model 420 HS	
Pipe range Min. I.D.	1.5 in.	38 mm	1.5 in.	38 mm
Pipe range Max. O.D.	5 in.	130 mm	5 in.	130 mm
Max. line speed*	82 ft/min	25 m/min	105 ft/min	32 m/min
Max. output*	620 lbs/hr	280 kg/hr	900 lbs/hr	410 kg/hr
Set of moldblocks	60 pairs	60 pairs	80 pairs	80 pairs
Moldblock length	3 in.	76.2 mm	3 in.	76.2 mm
Moldblock chain length	180 in.	4570 mm	240 in.	6095 mm
Forming section length	66 in.	1675 mm	96 in.	2440 mm
Corrugator drive motor	5 hp	4 kw	5 hp	4 kw
Isolation transformer	7.5 kva	7.5 kva	7.5 kva	7.5 kva
Mold cooling fans (2)	4.6 hp	3.4 kw	4.6 hp	3.4 kw
Corrugator lifter motor	.75 hp	.56 kw	.75 hp	.56 kw
Corrugator travel motor	.75 hp	.56 kw	.75 hp	.56 kw
Dimensions				
Centre height	45¼ in.	1150 mm	45¼ in.	1150 mm
Length	116 in.	2950 mm	146 in	3710 mm
Width	71 in.	1800 mm	71 in.	1800 mm
Machine Heights				
Smallest mold closed	70 in.	1800 mm	70 in.	1800 mm
Smallest mold opened	76 in.	1930 mm	76 in.	1930 mm
Largest mold closed	70 in.	1800 mm	70 in.	1800 mm
Largest mold opened	76 in.	1930 mm	76 in.	1930 mm
Weight, approx.	10070 lbs	4050 kg	11100 lbs	5030 kg
Water Chilling Unit				
Chilling unit compressor	3 hp	2.2 kw	5 hp	3.7 kw
Circulating pump	1.5 hp	1.1 kw	1.5 hp	1.1 kw
Internal Cooling				
Chilling unit compressor	3 hp	2.2 kw	3 hp	2.2 kw
Circulating pump	1.5 hp	1.1 kw	1.5 hp	1.1 kw
Air turbine	2.1 hp	1.6 kw	2.1 hp	1.6 kw

*Line speeds and outputs are theoretical and depend upon type of plastic processed, pipe size, profile configuration and cooling water at 6°C or Corma's water chilling unit.

Note: Corma reserves the right to change specifications in the interest of progress without prior notice.

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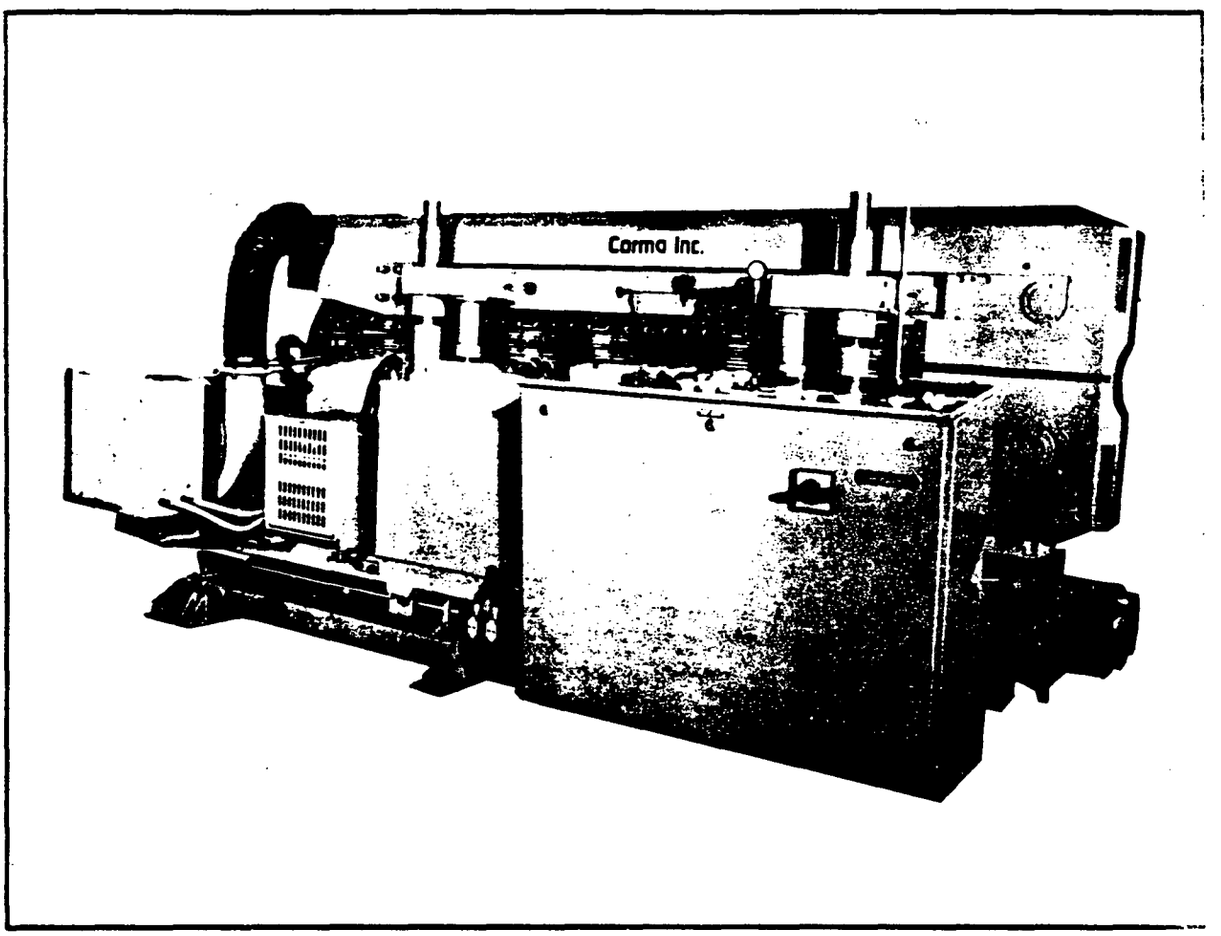
Corma Corrugator

Model
A-42 **620 / 620 HS**

For tubing sizes:
2 in. I.D. to 8 in. O.D.
(50 mm I.D. to 200 mm O.D.)



The model 620 corrugator is mounted on two base plates in which height and sideways adjustments are incorporated.

The corrugator housings are built on a base frame which is held to the corrugator base using guide bushings. This arrangement is advantageous as the corrugator cannot fall off the track, and it lets the machine slide on the guide shafts back and forth rather than rolling on wheels, which have the tendency to climb the rails, and bring the corrugator out of alignment with the extruder die.

The top housing is held in precise alignment by four solid columns and bushings. All drive sprockets are permanently engaged even when the top housing is lifted by the optional lifting system. The lifting system allows for easy maintenance, line-up, etc.

In the molding section, the molds are pressed together by extra spring loaded guides.

An automatic and adjustable pressurized lubrication system, complete with low level indicator and pressure gauge is standard. A measured amount of oil is fed to all required lubrication points.

On the welded steel base there are two cooling fans, in front of which radiators are installed. The corrugator housings are equipped with cooling pipes for intense water cooling. Both can either be hooked up to the customer's water supply or to the optional heavy duty water cooling unit.

A complete electrical panel built to the specified current is part of the machine. The operating station has digital readout for production speed, supply volts, amps drawn and total production. The electrical panel, when the extruder is wired in, has an interlock provision which stops the extruder if the corrugator should stop for any reason. This device monitors the actual moldblock movement.

The corrugator moldblocks are driven by a variable speed DC drive.

One set of moldblock carrier bases are installed.

Before leaving the Corma factory, the corrugator is dry test run and all functions are checked.

A **two year warranty** covers the corrugator except for components bought by Corma. For these components the manufacturer's warranty applies.

Options

1) Heavy duty air chilling unit for moldblock cooling. This is a complete chilling unit, installed in the corrugator base. The standard radiators are replaced by evaporators.
2) Heavy duty water cooling unit. This supplies cold water to the radiators on the fans and to the corrugator housings.
3) Pipe aftercooler c/w water reservoir, recirculating pump and spray nozzles, dry-off fan and haul-off connected to the corrugator for precise haul-off speed. The sheetmetal used is stainless steel. The electric controls, incorporated in the main corrugator panel, are activated from the corrugator control station. The complete unit, built on four casters, rolls back and forth together with the corrugator to which it is connected.
4) Internal pipe cooling system. This feature is especially advantageous for slow setting plastics. It increases production speed as it reduces or even eliminates the resoftening of the pipe after it has left the corrugator.
5) Two automatic temperature control valves which regulate the temperature of the corrugator housings, and shut down the waterflow, if no cooling is required. (Not required if option 2 is bought)
6) Isolation and step-down transformer. This option protects the DC drive by acting as a filter in locations where voltage spikes and interference from other equipment is found.
7) Electrically operated lifting mechanism to lift the top housing. This feature simplifies the lining up of the extruder die with the moldblocks and if a power interruption should occur, the corrugator can simply be opened up and cleaned out. No tools are required and production time is not wasted.
8) Variable moldblock track length. This feature allows for a specific hose length to be produced without having to throw away extra product at every track revolution.
9) Digital temperature indicator complete with six station selector switch.
10) Special modifications to the corrugator can be made and will be quoted on request.

Specifications	Model 620		Model 620 HS	
Pipe range Min. I.D.	2 in.	50 mm	2 in.	50 mm
Pipe range Max. O.D.	8 in.	200 mm	8 in.	200 mm
Max. line speed*	65 ft/min	20 m/min	100 ft/min	30 m/min
Max. output*	880 lbs/hr	400 kg/hr	1430 lbs/hr	650 kg/hr
Set of moldblocks	68 pairs	68 pairs	90 pairs	90 pairs
Moldblock length	4 in.	101.6 mm	4 in.	101.6 mm
Moldblock chain length	272 in.	6910 mm	360 in.	9145 mm
Forming section length	108½ in.	2755 mm	152½ in.	3875 mm
Corrugator drive motor	5 hp	3.7 kw	5 hp	3.7 kw
Isolation transformer	7.5 kva	7.5 kva	7.5 kva	7.5 kva
Mold cooling fans (2)	4.6 hp	3.4 kw	4.6 hp	3.4 kw
Corrugator lifter motor	.75 hp	.56 kw	.75 kp	.56 kw
Corrugator travel motor	.75 hp	.56 kw	.75 hp	.56 kw
Dimensions				
Centre height	45¼ in.	1150 mm	45¼ in.	1150 mm
Length	161 in.	4090 mm	208 in.	5280 mm
Width	58 in.	1480 mm	58 in.	1480 mm
Machine Heights				
Smallest mold closed	80 in.	2000 mm	80 in.	2000 mm
Smallest mold opened	90 in.	2280 mm	90 in.	2280 mm
Largest mold closed	80 in.	2000 mm	80 in.	2000 mm
Largest mold opened	90 in.	2280 mm	90 in.	2280 mm
Weight, approx.	13680 lbs	6200 kg	16750 lbs	7600 kg
Water Chilling Unit				
Chilling unit compressor	5 hp	3.7 kw	5 hp	3.7 kw
Circulating pump	1.5 hp	1.1 kw	1.5 hp	1.1 kw
Internal Cooling				
Chilling unit compressor	3 hp	2.2 kw	3 hp	2.2 kw
Circulating pump	1.5 hp	1.1 kw	1.5 hp	1.1 kw
Air turbine	5 hp	3.7 kw	5 hp	3.7 kw

*Line speeds and outputs are theoretical and depend upon the plastic processed, pipe size, profile configuration and cooling water at 6°C or Corma's water chilling unit.
Note: Corma reserves the right to change specifications in the interest of progress without prior notice.

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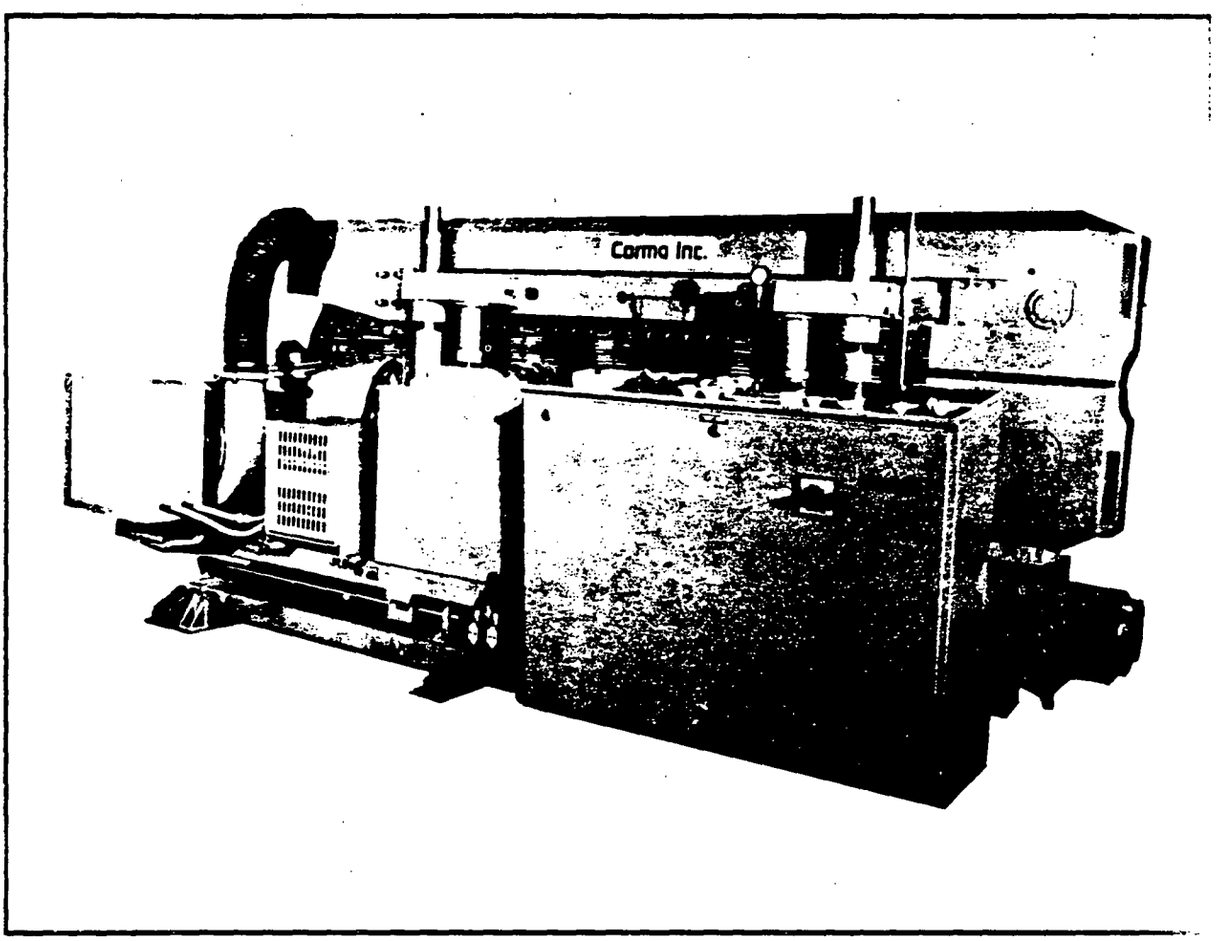
Corma Corrugator

Model
A-44 **820 / 820 HS**

For tubing sizes:
2 in. I.D. to 10 in. O.D.
(50 mm I.D. to 250 mm O.D.)



The model 820 corrugator is mounted on two base plates in which height and sideways adjustments are incorporated.

The corrugator housings are built on a base frame which is held to the corrugator base using guide bushings. This arrangement is advantageous as the corrugator cannot fall off the track, and it lets the machine slide on the guide shafts back and forth rather than rolling on wheels, which have the tendency to climb the rails, and bring the corrugator out of alignment with the extruder die.

The top housing is held in precise alignment by four solid columns and bushings. All drive sprockets are permanently engaged even when the top housing is lifted by the optional lifting system. The lifting system allows for easy maintenance, line-up, etc.

In the molding section, the molds are pressed together by extra spring loaded guides.

An automatic and adjustable pressurized lubrication system, complete with low level indicator and pressure gauge is standard. A measured amount of oil is fed to all required lubrication points.

On the welded steel base there are two cooling fans, in front of which radiators are installed. The corrugator housings are equipped with cooling pipes for intense water cooling. Both can either be hooked up to the customer's water supply or to the optional heavy duty water cooling unit.

A complete electrical panel built to the specified current is part of the machine. The operating station has digital readout for production speed, supply volts, amps drawn and total production. The electrical panel, when the extruder is wired in, has an interlock provision which stops the extruder if the corrugator should stop for any reason. This device monitors the actual moldblock movement.

The corrugator moldblocks are driven by a variable speed DC drive.

One set of moldblock carrier bases are installed.

Before leaving the Corma factory, the corrugator is dry test run and all functions are checked.

A **two year warranty** covers the corrugator except for components bought by Corma. For these components the manufacturer's warranty applies.

Options

1) Heavy duty air chilling unit for moldblock cooling. This is a complete chilling unit, installed in the corrugator base. The standard radiators are replaced by evaporators.
2) Heavy duty water cooling unit. This supplies cold water to the radiators on the fans and to the corrugator housings.
3) Pipe aftercooler c/w water reservoir, recirculating pump and spray nozzles, dry-off fan and haul-off connected to the corrugator for precise haul-off speed. The sheetmetal used is stainless steel. The electric controls, incorporated in the main corrugator panel, are activated from the corrugator control station. The complete unit, built on four casters, rolls back and forth together with the corrugator to which it is connected.
4) Internal pipe cooling system. This feature is especially advantageous for slow setting plastics. It increases production speed as it reduces or even eliminates the resoftening of the pipe after it has left the corrugator.
5) Two automatic temperature control valves which regulate the temperature of the corrugator housings, and shut down the waterflow, if no cooling is required. (Not required if option 2 is bought)
6) Isolation and step-down transformer. This option protects the DC drive by acting as a filter in locations where voltage spikes and interference from other equipment is found.
7) Electrically operated lifting mechanism to lift the top housing. This feature simplifies the lining up of the extruder die with the moldblocks and if a power interruption should occur, the corrugator can simply be opened up and cleaned out. No tools are required and production time is not wasted.
8) Variable moldblock track length. This feature allows for a specific hose length to be produced without having to throw away extra product at every track revolution.
9) Digital temperature indicator complete with six station selector switch.
10) Special modifications to the corrugator can be made and will be quoted on request.

Specifications	Model 820		Model 820 HS	
Pipe range Min. I.D.	2 in.	50 mm	2 in.	50 mm
Pipe range Max. O.D.	10 in.	250 mm	10 in.	250 mm
Max. line speed*	65 ft/min	20 m/min	100 ft/min	30 m/min
Max. output*	880 lbs/hr	400 kg/hr	1430 lbs/hr	650 kg/hr
Set of moldblocks	68 pairs	68 pairs	90 pairs	90 pairs
Moldblock length	4 in.	101.6 mm	4 in.	101.6 mm
Moldblock chain length	272 in.	6910 mm	360 in.	9145 mm
Forming section length	108½ in.	2755 mm	152½ in.	3875 mm
Corrugator drive motor	7.5 hp	5.6 kw	7.5 hp	5.6 kw
Isolation transformer	10 kva	10 kva	10 kva	10 kva
Mold cooling fans (2)	4.6 hp	3.4 kw	4.6 hp	3.4 kw
Corrugator lifter motor	.75 hp	.56 kw	.75 kp	.56 kw
Corrugator travel motor	.75 hp	.56 kw	.75 hp	.56 kw
Dimensions				
Centre height	45¼ in.	1150 mm	45¼ in.	1150 mm
Length	161 in.	4090 mm	208 in.	5280 mm
Width	58 in.	1480 mm	58 in.	1480 mm
Machine Heights				
Smallest mold closed	80 in.	2000 mm	80 in.	2000 mm
Smallest mold opened	90 in.	2280 mm	90 in.	2280 mm
Largest mold closed	82 in.	2050 mm	82 in.	2050 mm
Largest mold opened	92 in.	2330 mm	92 in.	2330 mm
Weight, approx.	13680 lbs	6200 kg	16750 lbs	7600 kg
Water Chilling Unit				
Chilling unit compressor	5 hp	3.7 kw	5 hp	3.7 kw
Circulating pump	1.5 hp	1.1 kw	1.5 hp	1.1 kw
Internal Cooling				
Chilling unit compressor	3 hp	2.2 kw	3 hp	2.2 kw
Circulating pump	1.5 hp	1.1 kw	1.5 hp	1.1 kw
Air turbine	5 hp	3.7 kw	5 hp	3.7 kw

*Line speeds and outputs are theoretical and depend upon the plastic processed, pipe size, profile configuration and cooling water at 6°C or Corma's water chilling unit.
Note: Corma reserves the right to change specifications in the interest of progress without prior notice.

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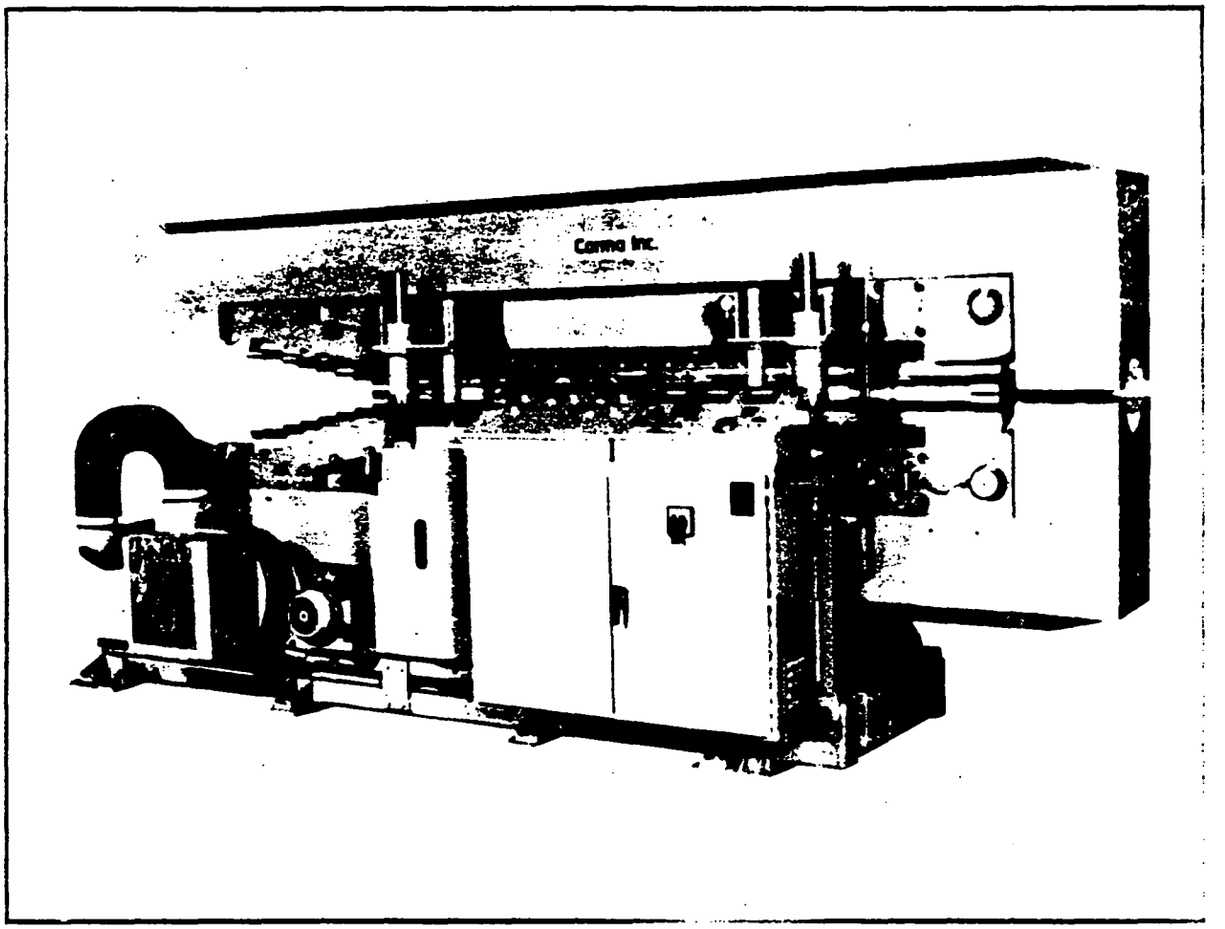
Corma Corrugator

A-46

Model
2020

For tubing sizes:
4 in. I.D. to 26 in. O.D.
(100 mm I.D. to 650 mm O.D.)



The model 2020 corrugator is able to produce a wide range of pipe sizes. To do so, a manually operated variable centre height adjustment has been incorporated. This feature enables one to maintain the centre height of the corrugator for all moldblock sizes.

Another feature of the model 2020 corrugator is that in addition to the variably adjustable DC drive, a manually operated four speed gearbox has been added. The advantage of this feature is that the gearbox ensures there is always either extra torque or extra speed available.

The model 2020 corrugator base is built on base plates which have mounting holes enabling the machine to be bolted to the floor. To level the base frames, there are height adjusting bolts which press on each plate. The two outside plates also incorporate sideways adjustments. The model 2020 corrugator is electrically operated as it moves back and forth on the base. An extra guide bar is installed for precise corrugator guiding.

On the welded steel base there are two fans, in front of which radiators are installed. The corrugator housings are equipped with cooling pipes for intense water cooling. Both can be either hooked up to the customer's water supply or to the optional heavy duty water cooling unit.

The top housing is held in precise alignment by four solid columns and bushings. All drive sprockets are permanently engaged; even when the top housing is lifted by the optional lifting system. The lifting system allows for easy maintenance, line-up, etc.

In the molding section, the molds are pressed together by extra spring loaded guides.

An automatic and adjustable pressurized lubrication system, complete with low level indicator and pressure gauge is standard. A measured amount of oil is fed to all required lubrication points.

A complete electrical panel built to the specified current is part of the machine. The operating station has digital readout for production speed, supply volts, amps drawn and total production. The electrical panel, when the extruder is wired in, has an interlock provision which stops the extruder if the corrugator should stop for any reason. This device monitors the actual movement of the moldblocks.

The corrugator moldblocks are driven by a variable speed DC drive.

One set of moldblock carrier bases are installed.

Before leaving the Corma factory, the model 2020 corrugator is dry test run and all functions are checked.

A **two year warranty** covers the model 2020 corrugator except for components bought by Corma. For these components the manufacturer's warranty applies.

Options

1) Heavy duty air chilling unit for moldblock cooling. This is a complete chilling unit installed in the corrugator base. The standard radiators are replaced by evaporators.
2) Heavy duty water cooling unit which supplies cold water to the radiators on the fans and to the corrugator housings.
3) Pipe aftercooler c/w water reservoir, recirculating pump and spray nozzles, dry-off fan and haul-off connected to the corrugator for precise haul-off speed. The sheetmetal used is stainless steel. The electric controls incorporated in the main corrugator panel are activated from the corrugator control station. The complete unit, built on four casters, rolls back and forth together with the corrugator to which it is connected.
4) Internal pipe cooling system. This feature is especially advantageous for slow setting plastics. It increases production speed as it reduces or even eliminates the resoftening of the pipe after it has left the corrugator.
5) Two automatic temperature control valves which regulate the temperature of the corrugator housings and shut down the waterflow if no cooling is required.
   (Not required if option 2 is bought)
6) Isolation and step-down transformer. This option protects the DC drive by acting as a filter in locations where voltage spikes and interference from other equipment is found.
7) Variable moldblock track length. This feature allows for a specific pipe length to be produced without having to throw away extra product at every track revolution.
8) Electrically operated centre height adjustment. This feature moves the bottom corrugator housing to the next preset moldblock height. The height can be adjusted both up and down.
9) Digital temperature indicator complete with six station selector switch.
10) Special modifications to the corrugator can be made and will be quoted on request.

Specifications	Model 2020	
Pipe range Min. I.D.	4 in.	100 mm
Pipe range Max. O.D.	26 in.	650 mm
Max. line speed*	72 ft/min	22 m/min
Max. output*	2200 lbs/hr	1000 kg/hr
Set of moldbloks	60 pairs	60 pairs
Moldblock length	6 in.	152.4 mm
Moldblock chain length	360 in.	9145 mm
Forming section length	124 in.	3150 mm
Corrugator drive motor	10 hp	7.5 kw
Isolation transformer	15 kva	15 kva
Mold cooling fans (2)	6.5 hp	4.8 kw
Corrugator lifter motor	1.5 hp	1.1 kw
Corrugator centre height motor	1 hp	.75 kw
Dimensions		
Centre height	62 in.	1575 mm
Length	214 in.	5436 mm
Width	92 in.	2337 mm
Machine Heights		
Smallest mold closed	104 in.	2642 mm
Smallest mold opened	112 in.	2845 mm
Largest mold closed	114 in.	2896 mm
Largest mold opened	122 in.	3100 mm
Weight, approx.	36000 lbs	16360 kg
Water Chilling Unit		
Chilling unit compressor	10 hp	7.5 kw
Circulating pump	1.5 hp	1.1 kw
Internal Cooling		
Chilling unit compressor	5 hp	3.7 kw
Circulating pump	1.5 hp	1.1 kw
Air turbine	12 hp	9 kw

*Line speeds and outputs are theoretical and depend upon type of plastic processed, pipe size, profile configuration and cooling water at 6°C or Corma's water chilling unit.

Note: Corma reserves the right to change specifications in the interest of progress without prior notice.

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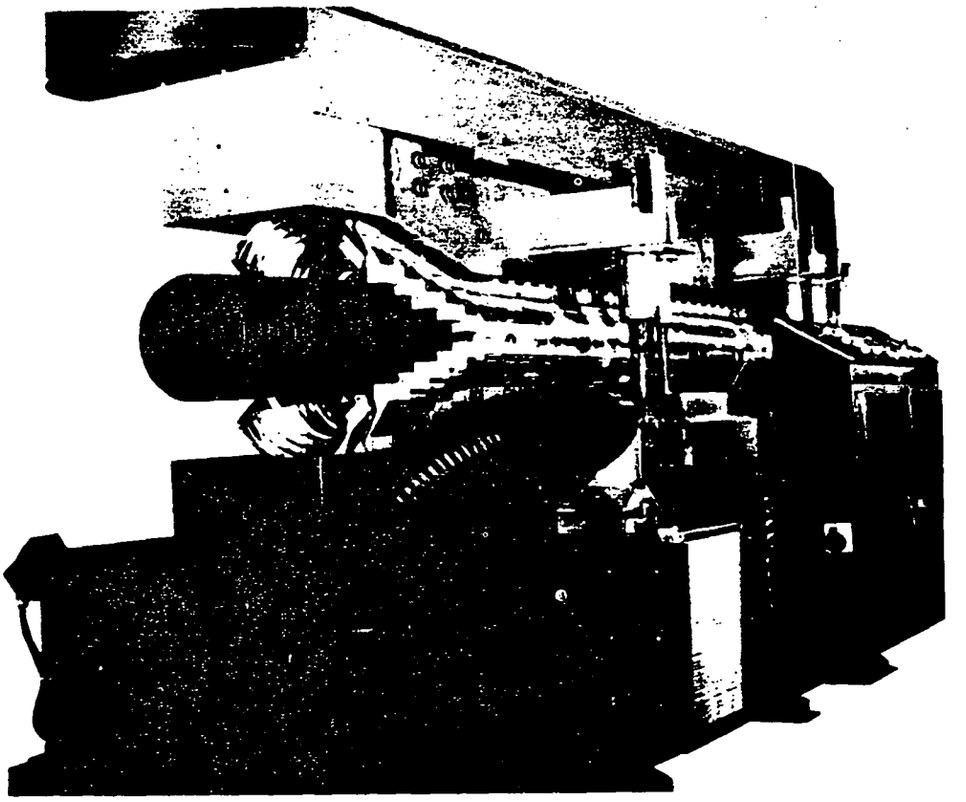
Printed in Canada

Corma Corrugator

Model
3020

For tubing sizes:
3.94 in. I.D. to 35.4 in. O.D.
(100 mm I.D. to 900 mm O.D.)



The model 3020 corrugator is able to produce a wide range of pipe sizes. To do so, a manually operated variable centre height adjustment has been incorporated. This feature enables one to maintain the centre height of the corrugator for all moldblock sizes.

The model 3020 employs the same moldblocks as does the model 2020 corrugator in the production range of the model 2020 corrugator.

Another feature of the model 3020 corrugator is that in addition to the variably adjustable DC drive a manually operated four speed gearbox has been added. The advantage of this feature is that the gearbox ensures there is always either extra torque or extra speed available.

The model 3020 corrugator base is built on base plates which have mounting holes enabling the machine to be bolted to the floor. To level the base frames, there are height adjusting bolts which press on each plate. The two outside plates also incorporate sideways adjustments. The model 3020 corrugator is electrically operated as it moves back and forth on the base. An extra guide bar is installed for precise corrugator guiding.

On the welded steel base there are two fans, in front of which radiators are installed. The corrugator housings are equipped with cooling pipes for intense water cooling. Both can be either hooked up to the customer's water supply or to the optional heavy duty water cooling unit.

The top housing is held in precise alignment by four solid columns and bushings. All drive sprockets are permanently engaged; even when the top housing is lifted by the optional lifting system. The lifting system allows for easy maintenance, line-up, etc.

In the molding section, the molds are pressed together by extra spring loaded guides.

An automatic and adjustable pressurized lubrication system, complete with low level indicator and pressure gauge is standard. A measured amount of oil is fed to the required lubrication points.

A complete electrical panel built to the specified current is part of the machine. The operating station has digital readout for production speed, supply volts, amps drawn and total production. The electrical panel, when the extruder is wired in, has an interlock provision which stops the extruder if the corrugator should stop for any reason. This device monitors the actual movement of the moldblocks.

The corrugator moldblocks are driven by a variable speed DC drive.

One set of moldblock carrier bases are installed. Before leaving the Corma factory, the model 3020 corrugator is dry test run and all functions are checked.

A **two year warranty** covers the model 3020 corrugator except for components bought by Corma. For these components the manufacturer's warranty applies.

Options

1) Heavy duty air chilling unit for moldblock cooling. This is a complete chilling unit installed in the corrugator base. The standard radiators are replaced by evaporators.
2) Heavy duty water cooling unit which supplies cold water to the radiators on the fans and to the corrugator housings.
3) Pipe aftercooler c/w water reservoir, recirculating pump and spray nozzles, dry-off fan and haul-off connected to the corrugator for precise haul-off speed. The sheetmetal used is stainless steel. The electric controls incorporated in the main corrugator panel are activated from the corrugator control station. The complete unit, built on four casters, rolls back and forth together with the corrugator to which it is connected.
4) Internal pipe cooling system. This feature is especially advantageous for slow setting plastics. It increases production speed as it reduces or even eliminates the resoftening of the pipe after it has left the corrugator.
5) Two automatic temperature control valves which regulate the temperature of the corrugator housings and shut down the waterflow if no cooling is required. (Not required if option 2 is bought)
6) Isolation and step-down transformer. This option protects the DC drive by acting as a filter in locations where voltage spikes and interference from other equipment is found.
7) Variable moldblock track length. This feature allows for a specific pipe length to be produced without having to throw away extra product at every track revolution.
8) Electrically operated centre height adjustment. This feature moves the bottom corrugator housing to the next preset moldblock height. The height can be adjusted both up and down.
9) Digital temperature indicator complete with six station selector switch.
10) Special modification to the corrugator can be made and will be quoted on request.

Specifications	Model 3020	
Pipe range Min. I.D.	3.94 in.	100 mm
Pipe range Max. O.D.	35.4 in.	900 mm
Max. line speed*	72 ft/min	22 m/min
Max. output*	2420 lbs/hr	1100 kg/hr
Set of moldblocks	60 pairs	60 pairs
Moldblock length	6 in.	152.4 mm
Moldblock chain length	360 in.	9145 mm
Forming length	124 in.	3150 mm
Corrugator drive motor	15 hp	11 kw
Isolation transformer	20 kva	20 kva
Mold cooling fans (2)	6.5 hp	4.8 kw
Corrugator lifter motor	1.5 hp	1.1 kw
Corrugator centre height motor	1 hp	.75 kw
Dimensions		
Centre height	73 in.	1854 mm
Length	228 in.	5761 mm
Width	105 in.	2660 mm
Machine Heights		
Smallest mold closed	120 in.	3048 mm
Smallest mold opened	128 in.	3250 mm
Largest mold closed	136 in	3454 mm
Largest mold opened	146 in.	3800 mm
Weight, approx.	40000 lbs	18180 kg
Water Chilling Unit		
Chilling unit compressor	10 hp	7.5 kw
Circulating pump	1.5 hp	1.1 kw
Internal Cooling		
Chilling unit compressor	5 hp	3.7 kw
Circulating pump	1.5 hp	11 kw
Air turbine	12 hp	9 kw

*Line speeds and outputs are theoretical and depend upon type of plastic processed, pipe size, profile configuration and cooling water at 6°C or Corma's water chilling unit.

Note: Corma reserves the right to change specifications in the interest of progress without prior notice.

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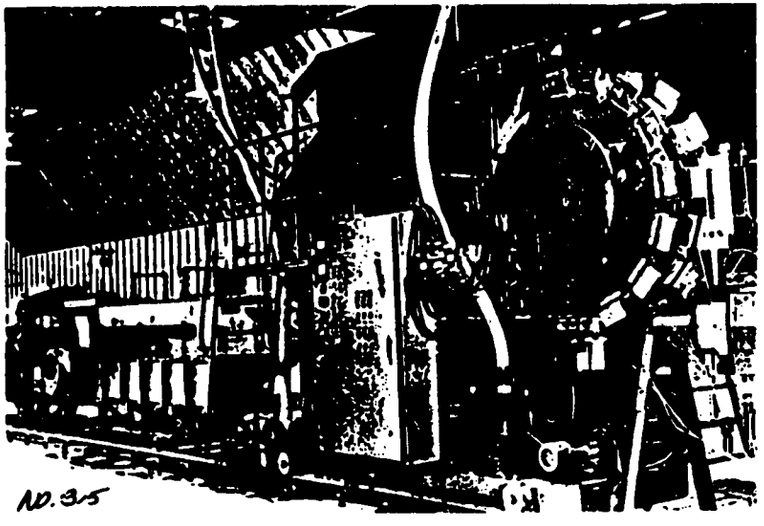


NO. 35

WORLD CLASS CORRUGATORS AND PERFORATORS

Manufactured By Cullom Machine Tool & Die, Inc., Cleveland, TN U.S.A.
Sold By Plastic Tube Machinery, Inc.

CULLOM HIGH SPEED VACUUM CORRUGATORS

Model	Nominal I.D.
No. 3456	3" thru 6"
No. 315	3" thru 15"
No. 615	6" thru 15"
No. 630	6" thru 30"

Operating in: Ill., Mich., Minn., Wis., Ontario

CULLOM PIERCING PERFORATORS

No. 3456	3" thru 6"
No. 615	6" thru 15"
No. 1530	15" thru 30"

Operating in Cal., Ill., Iowa, Mich., Minn., Ohio, Ontario, Switzerland, Wis., OR, FL, NC

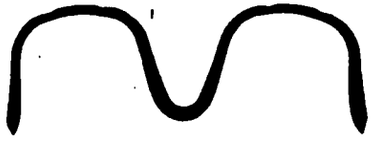
For information and pricing please contact

EXTRUDERS AND CORRUGATING LINES FOR THE PLASTIC TUBING INDUSTRY

PLASTIC TUBE MACHINERY, INC.
5215 - 11 Monroe St
Toledo, OH 43623
(419) 885-3624 Telex (WU) 704858

Also available are installed turn-key operations including: resin system, dies, extruder, screen changer, corrugator, perforator, driller, cut-off and coilers

ACTUAL CROSS SECTION OF 12" PIPE VACUUM FORMED ON CULLOM No. 315 CORRUGATOR



The vacuum process produces excellent wall thickness distribution, strength, and surface appearance at high production rates and using low cost forms of resins. With proven success at vacuum forming the 15" size, we are proceeding with the No. 630 Model to produce larger sizes including 18", 24" and 30" I.D.

CULLOM 3456-80 VACUUM CORRUGATOR
Produces 3" thru 6" tubing

Vacuum formed, clam-shell mold closing: Uniform longitudinal wall thickness along valley, sidewall, and crown. No mold joint or seam line problems due to the clam-shell. No mold timing, fixed center line height.

- 80 pair, 4" long clam-shell mold carriers.
- Produces 26'8" of tubing per revolution.
- Vacuum drawn through 5 individually controlled manifolds along the mold tunnel.
- Vacuum is produced by either 1-20HP rotary blower or 1-25HP liquid ring vacuum pump (customer preference).
- 8'4" mold tunnel provides for 6 second vacuum drawn mold set-up time at 70FPM.
- Center line height 52".
- Fog internal cooling system.
- External mold cooling is done by 30HP blower.
- Powered traversing system w/corrugator and cooling tank on same 42' track (length of track provides for easy screw removal).
- Variable speed transmission on tube puller for precise stretch control.
- Anti-twist at down stream end of cooling tank.
- Clam-shell mold carriers are moved on axle and wing bearings.
- Complete size change time (to include die change using 2 men) is 2 1/4 hours.
- Drip oil lubricating system.
- Panel contains: FPM indicator, DC drive controls to include 4 emergency stop switches and extruder latch circuit, traversing controls, all cooling tank controls (water pumps and drying fans), temperature indicators, cooling blower, vacuum internal cooling, on-off counter, and hour meters.
- Controls on customer specified side.
- For optimum production rates 6", 30:1, 400HP extruder recommended.
- Total power requirement: 40 AMP for corrugator, 40 AMP for blower, and 30 AMP for vacuum pump.

CULLOM PERFORATORS

Model 3456P

Perforates from 3" thru 6" corrugated tubing.
*Principle:cam operated piercing perforator can cut four different pitches with only the change of the pulling wheels. Cuts up to eight rows of perforations. Cuts very accurately at production speeds up to 45 FPM. Size change over is accomplished in 30 minutes. Priced economically. All perforators sold since 1978 are still perforating tubing every day.

Model 3456 UHS(ultra high speed).

Perforates from 3" thru 6" corrugated tubing.
*Principle: cam operated pulling/cutting wheels. The cutters are in the pulling wheels. Cuts up to eight rows of perforations. The optimum perforating machine-absolutely accurate cutting. Low maintainance. Size change-over is accomplished in 5 minutes. Perforates corrugated tubing at speeds in excess of 85 FPM.

Model 815 PD Perforator and Driller.

Perforates and drills 8" thru 15" corrugated tubing.
*Principle: cam operated piercing perforator. Cam operated hydraulic drilling perforator. Can cut four different pitches. Cuts up to eight rows of perforations either all in the same valley or in alternating valleys. Size change-over is accomplished in 45 minutes. Changing from piercing knives to hydraulic drills is accomplished in only 30 minutes. Four speed transmission to achieve the high speed of 30 FPM for 8" tubing. The most economical way to perforate large diameter tubing.

Model 815 P

Perforates 8" thru 15" corrugated tubing.
*Principle: cam operated piercing perforator. Can cut four different pitches. Cuts up to eight rows of perforations either all in the same valley or in alternating valleys. Size change-over is accomplished in only 30 minutes. Four speed transmission to achieve the high speed of 30 FPM for 8" tubing. The most economical way to perforate large diameter tubing.

CULLOM DIES AND MOLD BLOCKS

DIES

*Extruder adaptor has a head pressure gate valve.
*One piece spider and mandrel; annular distribution is easily obtained and maintained; distribution bolts are through the bushing into the mandrel.
*3" die-spider mandrel and bushing; adjustable outer die.
*4"-6" die-base die with changeable tooling for 4", 5", and 6" tubing; adjustable inner die.
*8"-15" die-base die with changeable tooling for 8", 10", 12" and 15" tubing; outer die bolt flange; inner die threaded and adjustable.

Mold Blocks

*Cut to customers pitch and profile design with the vacuum slots cut in each crown.

Corrugator Model	Mold length
Cullom #123	3"
Cullom #3456	4"
Cullom #315	8"
Cullom #836	12"

EQUIPMENT LIST
CURRENT 2-22-87

ENGINE LATHES:
Graziano w/Travadial 12" x 30"
Binns & Berry 34" over carriage x 15' between centers
Webb w/Travadial 17" x 60" w/2" spindle hole
Mori Seiki w/Travadial 17" x 50" w/2" spindle hole
Elliot Concord 460 w/travadial 18" x 96" 3"spindle hole

VERTICAL TURRET LATHES:
Hercules Broadbent w/78" swing
Jungenthal maximum capacity 47½" w/digital readout

TURRET LATHE:
Tsugami model T-SPL high precision w/Travadial

JIGBORER:
Knight Jigmaster w/digital readout to .0001

HORIZONTAL BORING MILL:
Summit 36" x 70" x 70" w/4 axis readout to .0001

MILLING MACHINE:
Okuma MC-6-VAE CNC w/automatic tool changer travel
59 x 24 x 24 New in 1986
2 each Bridgeport Interact 4 CNC new in 1986
Van Norman #22 horizontal and vertical 32" x 12"
Induma 15" x 30" R8 collets
Shizuoka Model VHR-G horizontal and vertical w/digital
readout Bridgeport type heavy duty head #40 taper
12" x 40" travel(two each of this machine)
Lagun 15" x 30" travel R8 collets w/digital readout
Shizuoka SPCH horizontal and vertical 12" x 40" travel
#50 taper
2 each Cugir FU36 horizontal and vertical 12" x 43"
travel heavy duty

PLANER MILL:
Ingersoll 48" x 48" x 240"

PLANER:
Woodward 10' table x 3' wide twin head
Rockford open side 48" x 48" x 144" 60hp main drive
twin heads plus side heads

DRILL PRESS:
Delta floor model ½" drill capacity 8½" between center
of drill and column(two of this machine)
Avely twin spindle #3 morse taper on both spindles
Arboga floor model 1" capacity
Barnes 3 spindle #4 taper power feed and cooling
adjustable table

RADIAL DRILL:
Toa 1½" drill capacity #4 morse taper 2' arm
Ooya 1300 #5 morse taper 4' arm 7½hp 13" column
Tominaga #5 morse taper 4' arm 7½hp 15" column

GRINDER:
DoAll surface 8" x 24"
Boyar Schultz surface
Brown and Sharpe center swing gap 10" between center:
16"
Brown and Sharpe internal 15" swing
Okamoto surface 12" x 24"
Four each pedestal grinders.

SHEAR:
Niagara 6' x ¼" capacity

POWER BRAKE:
8' capacity

IRON WORKER:
Buffalo

POWER ROLLER:
6' x ¼" capacity

PRESS:
100 ton hydraulic w/5' x 3' bed capacity
Bliss 28 ton

SAW:
Marvel cutoff 18 x 18
Johnson cut off 16 x 10
DoAll model #2013-U 20" throat
DoAll model V-36 36" throat

TRACER TORCH:
MG PC-551 6" thick x 48" x 96" capacity

TOOL SHARPENER:
K.O.Lee model 600

WIRE WELDER:
600 amp Lincoln
250 amp Airco
300 amp Miller(two each of this machine)

HELIWELDER:
Airco AC-DC model 2a/DDR-224HPS/B-D

BAND FILER:
DoAll model BF

ENGRAVING MACHINE:
Kirba type LH212

CULLOM 123 VACUUM CORRUGATOR
Produces ½" through 3" I.D. Tubing

Vacuum formed, clam-shell mold closing: Uniform longitudinal wall thickness along valley, sidewall and crown. No mold joint or seam line problems due to the clam-shell. No mold timing, fixed center line height.

Standard 80 pair, 3" long clam-shell mold carriers.

Variable length available(240" to 264" per revolution).

Mold carriers are quick change type(no wrenches needed).

8' closed mold length.

Vacuum drawn through 4 individually controlled manifolds along the mold tunnel.

Vacuum is produced by one 15 HP liquid ring vacuum pump.

External mold cooling is done by 10 HP blower.

Fog internal cooling can be introduced.

Powered traversing system on 19' track(length of track provides for easy screw removal).

Tube cooling tank w/puller available.

Clam-shell mold carriers are moved on axle and wing bearings.

Drip oil lubrication system.

Complete size change time(to include die and die heat up/2men) 2 hours.

Panel contains: FPM indicator, DC drive controls to include 4 emergency stop switches and extruder latch circuit, traversing controls, temperature indicators, cooling blower, vacuum(on/off) counters and hour meters.

Controls on customer specified side.

For optimum production rates 3½" 30:1 75HP extruder recommended.

Total power requirement: 40 AMP 3 PHASE 480 VOLT AC.

THE CULLOM VACUUM FORMING PROCESS OF CORRUGATED PLASTIC TUBING

The "World Class" Cullom Vacuum Corrugator provides cost and quality benefits far above that of blow molding corrugators. Because of the precise machining of our mold carriers and bearing ways and because of the ease of moving our carriers on axle and wing bearings, we can achieve extremely high speeds with very low horsepower. With our moisture reinforced air cooling, we can sustain these high speeds in production. Production experience to date(over 180,000,000 feet) have proven that the vacuum process allows production of high quality tubing using lower cost material as compared to blow-molding. The vacuum forming process gives the tubing a more uniform longitudinal wall thickness along the valley, sidewall and crown. With our clam-shell mold carriers, our corrugators require no mold timing. Tubing produced with the clam-shell molds have no mold joint or seamline problems. Culvert tubing can be made stronger with vacuum forming because a much thicker wall can be formed than can be done with blow molding. The vacuum clam-shell corrugator can produce other shapes and configurations other than annular much simpler than blow molding.

CULLOM 315 VACUUM CORRUGATOR
Produces 3" thru 15" ZP Tubing

Vacuum formed, clam-shell mold closing: Uniform longitudinal wall thickness along valley, sidewall, and crown. No mold joint or seam line problems due to the clam-shell. No mold timing, fixed center line height.

- Unequalled in production speed and quality of tubing. It is capable of producing 4" diameter drain tile at 80 FPM at ambient temperatures of 90°F.
- No troublesome water chilling system is needed to operate at maximum capacity.
- Patented in the U.S.A. and Canada.
- Produces quality tubing using wide spec PE or regrind.
- 45 pair, 8" long clam-shell mold carriers.
- 3" thru 6" molds can be run on risers or can fit directly to clam-shell mold carriers.
- Produces 30' of tubing per revolution.
- Vacuum drawn through five individually controlled manifolds along the mold tunnel.
- Vacuum is produced by either 3-20HP rotary blowers or 3-25HP liquid ring vacuum pumps(customer preferance).
- Fog internal cooling system.
- External mold cooling is done by 30 HP blower.
- Powered traversing system w/corrugator and cooling tank on same 42' track(length of track provides for easy screw removal).
- Variable speed transmission on tube puller for precise stretch control.
- Anti-twist at down stream end of cooling tank.
- Clam-shell mold carriers are moved on axle and wing bearings.
- Drip oil lubricating system.
- Complete size change time(to include die change using two men) three hours.
- Panel contains: FPM indicator, DC drive controls to include-four emergency stop switches and extruder latch circuit, traversing controls, all cooling tank controls(water pumps and drying fans), temperature indicators, cooling blower, vacuum internal cooling(on/off) counter, and hour meters.
- Controls on customer specified side.
- For optimum production rates 6", 30:1, 400 HP extruder recommended.
- Total power requirement: 80 AMP for corrugator, 40 AMP for blower, 90 AMP for vacuum pumps.

CULLOM 3456-90 VACUUM CORRUGATOR
Produces 3" thru 6" tubing

Vacuum formed, clam-shell mold closing: Uniform longitudinal wall thickness along valley, sidewall, and crown. No mold joint or seam line problems due to the clam-shell. No mold timing, fixed center line height.

- 90 pair, 4" long clam-shell mold carriers.
- Produces 30' of tubing per revolution.
- Vacuum drawn through 5 individually controlled manifolds along the mold tunnel.
- Vacuum is produced by either 1-20HP rotary blower or 1-25HP liquid ring vacuum pump(customer preference).
- 10' mold tunnel provides for 6 second vacuum drawn mold set-up time at 85 FPM.
- Center line height 52".
- Fog internal cooling system.
- External mold cooling is done by 30HP blower.
- Powered traversing system w/corrugator and cooling tank on same 42' track(length of track provides for easy screw removal).
- Variable speed transmission on tube puller for precise stretch control.
- Anti-twist at down stream end of cooling tank.
- Clam-shell mold carriers are moved on axle and wing bearings.
- Complete size change time(to include die change using 2 men) 2.5 hours.
- Drip oil lubricating system.
- Panel contains: FPM indicator, DC drive controls to include 4 emergency stop switches and extruder latch circuit, traversing controls, all cooling tank controls(water pumps and drying fans), temperature indicators, cooling blower, vacuum internal cooling, on-off counter, and hour meters.
- Controls on customer specified side.
- For optimum production rates 6", 30:1, 400HP extruder recommended.
- Total power requirement: 40 AMP for corrugator, 40 AMP for blower, and 30 AMP for vacuum pump.

VC836-50 Vacuum Corrugator

In order to bring down the high cost of manufacturing large diameter corrugated polyethylene tubing, Cullom Machine introduces the Model 836-50 Economy Vacuum Corrugator. The Cullom 836-50 Vacuum Corrugator easily vacuum forms superior quality tubing using a continuous clam shell mold tunnel with a high speed carriage and mold return.

- *The patented Cullom vacuum process produces superior quality tubing with even plastic distribution along valleys, walls, and crowns which means better streagth with less weight per foot.
- *More economical material(wide spec) forms as well as virgin material at less cost per pound.
- *Faster production rate-the vacuum process holds the formed tube tightly in the mold blocks for more efficient through the mold cooling.
- *Cullom's continuous clam shell molding system produces high quality superior tubing with no mismatched corrugations. Mold halves are mounted to independent carriages. Carriages form independent links in a continuous chain through the mold tunnel.
- *Perfectly matched mold blocks eliminate seamline problems and stress cracking. Precision manufacturing of mold blocks and hinge assemblies assure that each closed mold will be tight and perfectly aligned.
- *The Cullom 836-50 Economy Corrugator will perform in the tradition of previous designs but with an economy feature.
- *Overall the corrugator with 36" mold blocks is 18 feet high, 12 feet wide and 28 feet long.
- *A 7 foot by 20 foot tube cooling unit couples to the corrugator and is aligned by 60 feet of parallel track to facilitate start up and extruder screw removal.
- *The remote console consists of a master reference system linking the corrugator and extruder operation. The controls in this console put the operator in control of:corrugator, 10HP regenerative DC drive, extruder drive, 3 each 25 HP liquid ring vacuum pumps, 2 each 20HP cooling fans, internal tube cooling system, and 2HP traversing drive. The console monitors mold block temperature(via infra red sensors), ammeter(motor load), feet per minute, resettable footage counters and hours of operation. Several infrequently adjusted controls are mounted at the machine. These include a 4 speed transmission on the corrugator drive (for best motor usage), a variable tube puller(for precise pitch control), and 6 individual vacuum manifolds(for efficient vacuum usage).

The 836-50 Economy Corrugator shares many features with the 836 Premium Corrugator. The major difference is in the mold chain. They both have a 10½ foot closed mold tunnel on a fixed 60" centerline to form quality tubing, quick release mold clamping, and a mold handling system to quickly and safely change mold blocks. The 836-50 Economy Corrugator uses 20 mold blocks instead of the 40 that are used in the 836 Premium. The empty space in the mold chain is filled by a high speed return mechanism which first accelerates the mold carriers then decelerates them safely back into the mold chain. As the 836-50 Economy Corrugator shares many of the same features as the 836 Premium, it can be upgraded to the 836 Premium.

*Risers are required for mold sizes less than 18".

APPENDIX D

EXAMPLES OF CULLOM AND CORMA PRICE QUOTES

* * * * * * *