CERTAIN LASER LIGHT-SCATTERING INSTRUMENTS FROM JAPAN

Determination of the Commission in Investigation No. 731-TA-455 (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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Don E. Newquist

Staff assigned:

Elizabeth Haines, Investigator
Christopher Johnson, Industry Analyst
Jeffrey Anspacher, Economist
Jerald Tepper, Financial Analyst
Marc Bernstein, Attorney

Robert Eninger, Supervisory Investigator

Address all communications to
Kenneth R. Mason, Secretary to the Commission
United States International Trade Commission
Washington, DC 20436

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Note.--Information that would reveal confidential operations of individual concerns may not be published and therefore has been deleted from this report.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

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

Based on the information obtained in this preliminary investigation, we determine that there is a reasonable indication that an industry in the United States is threatened with material injury by reason of imports of certain laser light scattering instruments ("LLSIs") and parts thereof from Japan that allegedly are sold at less than fair value ("LTFV"). 1/

The legal standard for the Commission's determination in preliminary antidumping investigations is set forth in section 733(a) of the Tariff Act of 1930. 2/ The Commission determines, based on the best information available at the time of the preliminary determination, whether there is a reasonable indication of a material industry to a domestic industry, or threat thereof, or of material retardation of establishment of such an industry, by reason of imports alleged to be sold at LTFV. 3/

In applying this standard, the Commission may weigh the evidence to determine whether "(1) the record as a whole contains clear and convincing evidence that there is no material injury, threat of material injury, or

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1/ Also see the "Additional Views of Commissioner Eckes."

2/ 19 U.S.C. § 1673b(a).

3/ In American Lamb Co. v. United States, 785 F.2d 994 (Fed. Cir. 1986), the Federal Circuit held that the purpose of preliminary investigations is to avoid the cost and disruption to trade cause by unnecessary investigations, and that the "reasonable indication" standard requires more than a finding that there is a possibility of such injury.

material injury by reason of LTFV imports of certain laser light-scattering instruments and parts thereof from Japan. Accordingly, effective March 19, 1990, the Commission instituted preliminary antidumping investigation No. 731-TA-455 (Preliminary).

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 March 23, 1990 (55 F.R. 10848). The conference was held in Washington, DC, on April 11, 1990, and all persons who requested the opportunity were permitted to appear in person or by counsel.

UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-455 (Preliminary)

CERTAIN LASER LIGHT-SCATTERING INSTRUMENTS AND PARTS THEREOF FROM JAPAN

Determination

On the basis of the record[1] developed in the subject investigation, the Commission determines,[2] pursuant to section 733(a) of the Tariff Act of 1930 (19 U.S.C. § 1673b(a)), that there is a reasonable indication that an industry in the United States is threatened with material injury by reason of imports from Japan of certain laser light-scattering instruments (LLSIs) and parts thereof,[3] provided for in subheadings 9027.30.40 and 9027.90.40 of the Harmonized Tariff Schedule of the United States (LLSIs were previously provided for under item 712.49 of the former Tariff Schedules of the United States), that are alleged to be sold in the United States at less than fair value (LTFV).

Background

On March 19, 1990, a petition was filed with the Commission and the Department of Commerce by Wyatt Technology Corp., Santa Barbara, CA, alleging that an industry in the United States is materially injured or threatened with

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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.

[3] The products covered by this investigation are laser light-scattering instruments and parts thereof from Japan that have classical measurement capabilities, whether or not also capable of dynamic measurements. The following parts are included in the scope of the investigation when they are manufactured for use only in a LLSI: Scanning photomultiplier assemblies, immersion baths, sample-containing structures, electronic signal-processing boards, molecular characterization software, preamplifier/discriminator circuitry, and optical benches.

material retardation; and (2) no likelihood exists that contrary evidence will arise in a final investigation." 4/

LIKE PRODUCT AND DOMESTIC INDUSTRY

The Commission begins its analysis by making factual determinations to define the "like product" and the "domestic industry." The "like product" is a "product that is like, or in the absence of like, most similar in characteristics and uses with the article subject to investigation." 5/ The term "domestic industry" means 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 product." 6/

The articles subject to investigation are certain laser light scattering instruments ("LLSIs") and parts thereof from Japan. In its notice of initiation, the Department of Commerce ("Commerce") defined the scope of the investigation as:

> [L]ight scattering instruments and parts thereof from Japan that have classical measurement capabilities, whether or not also capable of dynamic measurements. Subject LSIs employ laser light and may use either the single-angle or multi-angle measurement technique. The following parts are included in the scope of the investigation when they are manufactured for use only in an LSI: Scanning photomultiplier assemblies, immersion baths, sample-containing structures, electronic signal-processing boards, molecular characterization software, preamplifier/discriminator circuitry, and optical benches. 7/

4/ American Lamb, 785 F.2d at 1001-04.

5/ 19 U.S.C. § 1677(10).

6/ 19 U.S.C. § 1677(4)(A).

7/ 55 Fed. Reg. 14333, 14334 (April 17, 1990). Commerce's scope determination, which encompassed all classical LLSIs, was broader than the Commission's in its notice of institution for this preliminary

(continued...)

LLSIs are instruments used for analysis of molecular structures. The instruments direct a very fine, focused beam of laser light at a solution containing the material being analyzed. Light passing through the sample, at one or multiple locations, is scattered after the beam strikes the dissolved or suspended particles. The instrument then determines the amount of light that is scattered. 8/

A classical LLSI, the imported instrument within the scope of investigation, measures light scattering intensity as a function of angle. 9/ There are two types of classical LLSIs: low-angle and multi-angle. In a low-angle instrument, there is a single, fixed detector set at close to a zero angle from the path of the laser beam. A low-angle LLSI can determine molecular weight immediately without any extrapolation. It cannot, however, measure molecular size. 10/

By contrast, in a multi-angle instrument, detection is made from a number of angles. This enables determination of molecular weight, molecular size, and how particles interact with the solvent or solution. 11/

7/(...continued)
investigation, which was limited to the subject of the petition, multi-angle LLSIs. Our determination encompasses all products within Commerce's scope determination.

8/ Report at A-2.

9/ Report at A-3.

10/ Report at A-5; Tr. at 73 (P. Wyatt).

11/ Report at A-2. Such measurements are made through use of a calibration technique such as the "Zimm plot." Report at A-5 & n.9.

In some instruments, multiple angle measurements are possible because the machine has multiple, fixed detectors. 12/ This is characteristic of the LLSIs manufactured by petitioner Wyatt Technology Corp. ("Wyatt"). 13/ In other instruments, multiple angle measurements are possible because the instrument contains a manually-controlled device known as a stepper motor that moves a single detector around the sample sequentially at many different angles. 14/ This is characteristic of the LLSIs exported to the United States by respondent Otsuka Electronics Co. ("Otsuka"). 15/ Such an instrument is known as a "goniometer." 16/

Multi-angle LLSIs may be equipped to make dynamic, as well as classical, light measurements. A dynamic measurement is one based upon the variation of light scattering intensity as a function of time. 17/ Dynamic measurements can be used to determine particle size, size distributions,

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12/ Report at A-5.

13/ Petition ex. 12 at 12-4. Such an instrument will be termed a "multiple detector LLSI." (This designation is made for purposes of convenience and is not one standard in the industry.)

14/ Report at A-3-5.

15/ Petition ex. 5 at 5-7.

16/ Report at A-5.

17/ Report at A-5 & n.11. See also Tr. at 116 (Karasz) (distinguishing dynamic from classical light scattering measurement on the grounds that the former measures the spectral character of the light while the latter measures the intensity of the scattered light).

and particle shape. 18/ A device capable of dynamic measurement is known as an "autocorrelator." 19/

Like Product

Our decision regarding the appropriate like product(s) in an investigation is essentially a factual determination, and we have applied the statutory standard of "like" or "most similar in characteristics and uses" on a case-by-case basis. 20/ In analyzing like product issues, we generally consider a number of factors relating to characteristics and uses including (1) physical characteristics, (2) uses, (3) interchangeability of the products, (4) channels of distribution, (5) customer or producer perceptions, (6) common manufacturing facilities and production employees, (7) production processes and, where appropriate, (8) price. 21/ No single factor is necessarily dispositive, and we may consider other factors that we deem relevant based upon the facts of a particular investigation. Generally, we have not drawn distinctions based on minor variations between

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18/ Report at A-6. The size information provided by a dynamic measurement differs somewhat from the size information provided by a classical measurement. See Tr. at 56-57 (P. Wyatt) (dynamic measurement provides hydrodynamic size, while classical measurement provides information about distribution of mass within the molecule); Tr. at 127 (Karasz).

19/ See Report at A-6.

20/ Asociacion Colombiana de Exportadores de Flores v. United States, 693 F. Supp. 1165, 1169 (CIT 1988) ("Asocoflores").

21/ See, e.g., Asocoflores, 693 F. Supp. at 1170; Certain Residential Door Locks and Parts Thereof from Japan, Inv. No. 731-TA-433 (Final), USITC Pub. 2253 at 4 (January 1990); 3.5" Microdisks and Media Therefor from Japan, Inv. No. 731-TA-389 (Final), USITC Pub. 2170 at 7-8 (March 1989).

the articles subject to an investigation, but have sought clear dividing lines among possible like products. 22/

The principal like product issues that we must address in this investigation are (1) whether goniometers and multiple-detector LLSIs constitute separate like products; (2) whether low-angle and multi-angle LLSIs constitute separate like products; and (3) whether those parts and components of LLSIs within the scope of investigation constitute a separate like product. 23/

For the reasons indicated below, we have found one like product for purposes of this preliminary investigation, consisting of classical LLSIs and certain components thereof. This like product is coextensive with the articles under investigation.

Whether different types of multi-angle LLSIs constitute separate like products

We first address whether all multi-angle LLSIs constitute a single like product or whether the two types of multi-angle LLSIs -- goniometers and multiple detector LLSIs -- should be separate like products. We determine that the distinctions between the two types of multi-angle instruments fail to establish the clear dividing line necessary to justify separate like product determinations.

22/ See, e.g., Polychloroprene from France and the Federal Republic of Germany, Inv. Nos. 731-TA-446-447 (Preliminary), USITC Pub. 2233 at 3 (November 1989).

23/ Another potential like product issue concerns whether any like product encompassing all classical LLSIs should also include LLSIs capable of dynamic measurement only (i.e. autocorrelators). Such a like product would encompass all LLSIs. Because neither party advocated such a like product definition and we have only extremely limited information concerning U.S. autocorrelator producers, we do not consider the issue here. We will, however, address the issue in any final investigation.

Goniometers and multiple detector instruments have certain different physical characteristics. 24/ We note, however, that all multi-angle LLSIs involve the assembly of various electronic components in slighlty different configurations. 25/

We also do not find that there are divergent end uses and lack of interchangeability between goniometers and multiple detector instruments. The basic function and use of all multi-angle LLSIs -- measurement of molecular size, weight, and particle interaction -- is the same for both multiple-detector LLSIs and goniometers. 26/

Moreover, the record indicates that customers and producers perceive goniometers and multiple detector LLSIs as similar, competitive products. 27/ Wyatt and Otsuka have both sold multi-angle LLSIs to the same type of customers. 28/

24/ As previously stated, the latter type of instrument has multiple fixed detectors, while goniometers such as the Otsuka instrument utilize a single detector with a stepper motor. There are also a number of specific differences between the Wyatt and Otsuka models. The Wyatt instruments use a type of detection device that is different from that used by the Otsuka. Wyatt uses photodiodes; Otsuka photomultipliers. See Tr. at 120 (Karasz), 178 (P. Wyatt). Additionally, Otsuka's instrument has a built-in autocorrelator but Wyatt's instruments do not. See Tr. at 63-64 (P. Wyatt), 117 (Karasz).

25/ See Report at A-6. Otsuka itself has indicated that its goniometer physically differs from other manufacturers' goniometers. Tr. at 147.

26/ Report at A-5.

27/ Wyatt has submitted statements from a goniometer manufacturer and a potential customer asserting that goniometers and multiple detector LLSIs are competitive products. Wyatt Postconference Brief, Exs. A, H. Another potential purchaser believes both Otsuka and Wyatt instruments are well-suited for general research. Report at A-40.

28/ Report at A-35; Tr. at 145-47; Statement of Toshio Asakura.

We do not believe that the physical characteristics, use, interchangeability, or customer perception factors either singly or in combination provide a sufficient basis for determining that goniometers and multiple-detector instruments are separate like products. Additionally, a number of relevant factors clearly support treating all multi-angle LLSIs as the same like product. All multi-angle LLSIs share common channels of distribution, being marketed in precisely the same manner. 29/ All multi-angle LLSIs are manufactured in the same manner by the same types of workers. 30/ Comparably equipped multi-angle LLSIs are priced similarly. 31/

We determine that the similarities in the essential end uses, distribution, manufacturing, and pricing among goniometers and multiple-detector LLSIs outweigh the differences in physical features and specifications among these two types of instruments. 32/ Consequently, we conclude that both types of multi-angle LLSIs constitute the same like product.

29/ Report at A-17; Tr. at 76-77 (G. Wyatt); 162 (Blow).

30/ See Report at A-14; compare Wyatt Postconference Brief at 20-23 (describing Wyatt assembly methods) with Otsuka Postconference Brief at Ex. C (describing Otsuka assembly methods).

31/ Report at A-34-39.

32/ We have concluded in the past that products with some differences in physical appearance and specific end-use applications should nonetheless be deemed the same like product if their basic function and methods of manufacture and distribution are similar. See, e.g., Mechanical Transfer Presses from Japan, Inv. No. 731-TA-429 (Final), USITC Pub. 2257 at 6-7 (February 1990); Plastic Tubing Corrugators from Canada, Inv. No. 701-TA-301 (Preliminary), USITC Pub. 2246 at 5-7 (December 1989); Shock Absorbers and Parts, Components, and Subassemblies Thereof from Brazil, Inv. No. 731-TA-421 (Preliminary), USITC Pub. 2128 at 13-15 (September 1988).

Whether low-angle LLSIs and multi-angle LLSIs constitute separate like products

Because low-angle LLSIs fall within the scope of the investigation as defined by Commerce, we must determine whether they constitute a separate like product or whether the like product should encompass all classical LLSIs (i.e. both low-angle and multi-angle). 33/

There are some physical differences between low-angle and multi-angle instruments, as there are between multiple detector instruments and goniometers. While multi-angle instruments have either multiple detectors or one detector with a stepper motor, low-angle instruments have one fixed detector. 34/

Both types of instruments can measure molecular weight but only the multi-angle instrument can measure particle size. Because some customers are principally interested in molecular weight measurements, either type of instrument would suit their needs. 35/ Particle sizing information, however, is critical to numerous industrial practical applications of laser light scattering, 36/ and a low-angle instrument could not be used for such applications.

The record indicates some customer and producer perceptions of low-

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33/ Neither Otsuka nor Wyatt produces low-angle instruments. Additionally, no low-angle instrument is currently imported from Japan. There is one domestic producer of such instruments.

34/ See Report at A-3-5.

35/ Report at A-10, A-12.

36/ Report at A-10.

angle and multi-angle instruments as competitive products. 37/ Low-angle and multi-angle LLSIs are distributed and sold in the same manner. 38/ There is not a clear distinction in the pricing of the two types of instruments. 39/

We believe that on balance the two types of instruments' similarities (in general characteristics and use, price, distribution, and customer and producer perceptions) outweigh their differences. 40/ Therefore we have concluded for purposes of this preliminary investigation that low-angle and multi-angle LLSIs are not separate like products. We will, however, reconsider the issue in any final investigation.

Whether those components of LLSIs within the scope of the investigation constitute a separate like product

We finally determine whether domestically produced parts of LLSIs like those within the scope of the investigation constitute a separate like product. In prior investigations, we have reviewed the following factors in examining whether components or "semi-finished" products should be included in the same like product as finished products: (1) the necessity for, and costs of, further processing; (2) the degree of interchangeability

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37/ Additionally, when Wyatt representatives were asked by staff at the conference how the customers for the two types of instruments differed, they did not answer the question directly, stating only that their instruments are more technologically advanced. Tr. at 74 (P. & G. Wyatt).

38/ Tr. at 77 (G. Wyatt).

39/ See Report at A-34-36.

40/ Compare Drafting Machines and Parts Thereof from Japan, Inv. No. 731-TA-432, USITC Pub. 2192 at 13 (May 1989) (very limited interchangeability and substantial differences in manufacturing facilities and employees, price, and channels of distribution "outweigh the partial similarity in physical appearance and function").

of articles at different stages of production; (3) whether the article at an 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. 41/ 42/ We have found that, although a "part" is not a finished product, it does not need to be identical to a finished product in order to be considered with a finished product as a single like product. 43/

Reviewing these factors, we note that the components under investigation need further processing before they can be used for laser light

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41/ E.g., Certain Residential Door Locks and Parts Thereof from Taiwan, Inv. No. 731-TA-433 (Final), USITC Pub. 2253 at 8 n.16 (January 1990); Certain Telephone Systems and Subassemblies Thereof from Japan and Taiwan, Inv. Nos. 731-TA-426 and 428 (Final), USITC Pub. 2237 at 5 n.9 (November 1989); 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, Inv. Nos. 303-TA-19-20 and 731-TA-391-399 (Preliminary), USITC Pub. 2083 at 20-22 (May 1988).

42/ Commissioner Rohr notes that in a case such as this involving a product which is primarily an assembly of basic electronic components which are assembled into bigger and bigger subassemblies this analysis may be unneccessarily complicated or unrevealing. He finds that it is not appropriate for purposes of this preliminary investigation to find that the parts identified in the scope of the investigation are separate like products from the finished LLSIs or from each other. The current record is insufficient to make any such distinction and he notes that he will reconsider this issue if further information is obtained in a final investigation.

43/ Shock Absorbers and Parts, Components, and Subassemblies Thereof from Brazil, Inv. No. 731-TA-421 (Preliminary), USITC Pub. 2128 at 12 (September 1988).

scattering. 44/ Moreover, the components are not interchangeable at different stages of production.

Because the components at issue are those "for use only in an LLSI," they are clearly dedicated for use in the finished product. 45/ There are no significant independent markets for the components at issue and finished machines. Customers desiring replacement components obtain them directly from the manufacturer from which they purchased an instrument, rather than purchasing them on the open market. 46/

The record further indicates that some of the individual components at issue do possess or incorporate an essential characteristic to an LLSI. For example, the optical bench is critical for accurate illumination of the sample. 47/ Software is essential to meaningful analysis of the measurements made by an LLSI. 48/ A number of the other components at issue also impart essential functions to an LLSI. 49/

44/ See Report at A-13-14.

45/ Some producers manufacture their own components. Report at A-13. Even those that use outside sources require that components conform to proprietary designs or particular specifications. Report at A-13; see Tr. at 47 (G. Wyatt).

46/ Tr. at 47 (G. Wyatt).

47/ Report at A-9. See also Wyatt Postconference Brief at 21.

48/ Report at A-9. Indeed, Wyatt indicates that its customers who purchase instruments "always" buy or receive Wyatt-prepared software as well. Tr. at 47, 76 (G. Wyatt).

49/ See Report at A-7-9. The information in the current record reflects generally on the types of components at issue; in a final investigation, we intend to generate information concerning each of the seven components under investigation.

The Commission has in previous investigations concluded that components dedicated to use in a finished product and essential to the product's operation should be included in the same like product as the finished product, notwithstanding that the components are not interchangeable with the finished product, especially if they incorporate essential characteristics. 50/ We therefore conclude that the like product in this investigation includes both the finished classical LLSIs and those LLSI components like those within the scope of investigation. 51/

Domestic Industry

In light of our like product determination, we determine that there is one corresponding domestic industry, composed of the producers of classical

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50/ See Certain Residential Door Locks and Parts Thereof from Japan, Inv. No. 731-TA-433 (Final), USITC Pub. 2253 at 8 (January 1990); Certain Telephone Systems and Subassemblies Thereof from Japan, Korea, and Taiwan, Inv. No. 731-TA-426-428 (Preliminary), USITC Pub. 2156 at 13-15 (February 1989). In these investigations the Commission noted that it has placed greater emphasis on essential characteristics and interchangeability factors when considering semifinished products that merely go through additional processing stages than when considering groups of components that must be combined to form the finished product. When a finished product, such as an LLSI, is comprised of many components, none of which contain the essential characteristics of the finished product, the Commission has found the factors of essential characteristics and interchangeability to be less significant.

51/ As previously mentioned, because the current record on the parts and components at issue is incomplete and the parties have not briefed the treatment of parts and components extensively, we will reconsider this matter in any final investigation. We request the parties to address in that investigation how the five factors relevant to parts and components issues listed above pertain to each of the seven components under investigation.

We further note that, as a general matter, our analysis of parts and components issues would be more thorough and detailed were parties to provide detailed information and arguments responsive to the general issue. We encourage parties in title VII investigations to address parts and components issues more extensively.

LLSIs and those components like those within the scope of investigation. 52/ We have identified the following firms as members of the domestic industry: Wyatt, Brookhaven Instruments Corporation ("Brookhaven"), 53/ LDC Analytical Corp., and Leeds and Northrup. LDC manufactures a low-angle instrument; all the remaining firms manufacture multi-angle instruments. 54/

52/ Otsuka has asserted that we should dismiss Wyatt's petition for lack of standing because there is no evidence that any other domestic producer supports the petition. Otsuka Postconference Brief at 3-4. We have taken the position that the Commerce Department, not the Commission, decides questions of standing. See Martial Arts Uniforms from Taiwan, Inv. No. 731-TA-424 (Preliminary), USITC Pub. 2148 at 6 n.13 (December 1988); Certain Table Wine from the Federal Republic of Germany, France, and Italy, Inv. No. 731-TA-283-285 (Preliminary), USITC Pub. 1771 at 4 n.5 (October 1985). Moreover, one other producer supports the petition. See Report at A-16.

53/ Wyatt has questioned Brookhaven's inclusion in the domestic industry because Brookhaven imports from France the turntable in its goniometer. However, most of the Brookhaven instrument's components (in terms of both number and value) are domestically sourced, and most of the product's value has been added in the United States. Moreover, the assembly of LLSI components which Brookhaven performs in the U.S. is a process that requires considerable technical expertise. See Report at A-13-14.

In deciding whether a firm is a domestic producer, we have examined: (1) the overall nature of production-related activities in the United States, including the extent and source of a firm's capital investment; (2) the technical expertise involved in production activity in the United States; (3) the value added to the product in the United States; (4) employment levels; (5) the quantity and type of parts sourced in the United States; and (6) any other costs and activities in the United States directly leading to production of the like product. See, e.g., Generic Cephalexin Capsules from Canada, Inv. No. 731-TA-423 (Final), USITC Pub. 2211 at 10-11 (August 1989); Certain All-Terrain Vehicles from Japan, Inv. No. 731-TA-388 (Final), USITC Pub. 2163 at 12 (March 1989); Erasable Programmable Read Only Memories from Japan, Inv. No. 731-TA-288 (Final), USITC Pub. 1927 at 11 n.23 (December 1986). These factors support Brookhaven's inclusion in the domestic industry.

54/ The domestic industry also encompasses domestic producers of LLSI components like those under investigation. We have been unable to identify any such firms, other than those that also produce instruments, in this preliminary investigation.

CONDITION OF THE INDUSTRY

The domestic industry has a number of distinctive characteristics that are of particular relevance to our preliminary determination. Because of these characteristics, some of the factors that we normally consider in assessing the condition of the domestic industry -- production, shipments, capacity utilization, employment, wages, financial performance, capital investments, and research and development expenditures -- have limited applicability. Certain factors, such as inventories, which are not normally maintained by LLSI producers, or capital investments, which tend to be quite small in the industry, are of little weight in this instance. The data that we have received with respect to a number of other factors, such as financial performance and research and development expenditures, has either been incomplete or not in a form that can be meaningfully analyzed. 55/

Classical LLSIs are expensive instruments. The base model instrument sells for in excess of $25,000. 56/ Options and accessories available from producers, however, can raise the total instrument price to over $90,000. 57/

The high prices of LLSIs are not principally a function of the costs of material and labor needed to manufacture an instrument. These instruments are the product of sophisticated technology. They entail substantial research and development costs that the producer must recoup to

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55/ We intend to develop both the quality and quantity of data concerning the condition of the domestic industry in any final investigation.

56/ Petition, exs. 2, 8, 13.

57/ Report at A-38.

operate profitably and continue the ongoing development of the instruments. 58/ Producers appear to devote substantial expenditures to research and development efforts. 59/

The universe of potential customers for classical LLSIs is small. Customers tend to be academic and corporate research laboratories. 60/ Nevertheless, repeat sales to customers are common. 61/ A small number of sales is made in any given year. Current domestic demand does not appear to exceed 50 instruments per year. 62/ Total domestic consumption of classical LLSIs has not increased appreciably during the 1987-89 period of investigation. 63/

Because of the small size and apparently static nature of the domestic market, seemingly small increases in the number of instruments that any foreign LLSI producer sells in the United States can nonetheless have a significant impact on market share and on sales revenue on the individual domestic producers. That the domestic industry is highly fragmented and

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58/ Tr. at 13-14 (G. Wyatt).

59/ Petition at 20; Report at A-26. We were unable to obtain research-and-development data for members of the domestic industry other than Wyatt. We intend to develop such information in any final investigation.

60/ Report at A-32.

61/ Report at A-17.

62/ Tr. at 139 (Blow).

63/ See Report at A-18, A-31. Because of the flat domestic market, U.S. LLSI producers have increasingly relied upon export sales. See Tr. at 30. Indeed, export sales have considerably greater significance to the classical LLSI industry than to most domestic industries whose conditions we consider in Title VII investigations. In any final investigation, we will explore further the role of export sales in the domestic industry and their relative profitability as compared to domestic sales, as well as the legal status of these sales in our evaluation.

consists largely of small business concerns with heavy dependency on research and development costs magnifies this potential impact. 64/ We believe that these factors make the domestic industry highly vulnerable to even small increases in LTFV imports.

REASONABLE INDICATION OF THREAT OF MATERIAL INJURY

We have made our affirmative determination on the basis of a reasonable indication of a threat of material injury rather than material injury. We did not make our determination based on present material injury because, considering the information available, even if a reasonable indication of material injury exists, the minimal level of imports, their small market share, and the lack of any discernible effect on prices in the United States indicates that there is no reasonable indication of material injury by reason of the allegedly LTFV imports. 65/

Section 771(7)(F) of the Tariff Act of 1930 directs the Commission to determine whether a U.S. industry is threatened with material injury by reason of imports "on the basis of evidence that the threat of material injury is real and actual injury is imminent. Such a determination may not be made on the basis of mere conjecture or supposition." 66/ The ten factors that the Commission must consider are:

> (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),

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64/ Report at A-15.

65/ See, e.g., Report at A-31, A-32, A-34.

66/ 19 U.S.C. § 1677(7)(F)(ii).

(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 probability that importation (or sale for importation) of the merchandise (whether or not it is actually being imported at the time) will be the cause of 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 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,

(IX) in any investigation under this title which involves imports of both raw agricultural product (within the meaning of paragraph (4)(E)(iv) and any product processed from such raw agricultural product, the likelihood 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 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/

In addition, we must consider whether dumping findings or antidumping remedies in markets of foreign countries against the same class of merchandise suggest a threat of material injury to the domestic

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67/ 19 U.S.C. § 1677(7)(F)(i).

industry. 68/ We consider each statutory consideration applicable to this investigation in turn. 69/ We consider no single factor to be dispositive.

Because the material in the record on Otsuka's capacity is confidential, we cannot discuss it in detail. We have concluded that the information available on foreign capacity, which contains a number of ambiguities, supports our affirmative preliminary threat determination. 70/

Otsuka's U.S. market penetration for its multi-angle LLSI is now very low. Otsuka, however, recently retained a new distributor, Polymer Laboratories, Inc. ("Polymer"), to market its instrument in the United States. Polymer intends to increase U.S. sales of the Otsuka multi-angle instrument and has aggressively marketed the instrument. 71/ 72/ Should Polymer succeed in its stated goal of selling only a few additional Otsuka instruments, it could nonetheless increase Otsuka's market share substantially because the domestic market is so small. Additionally, any

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68/ See 19 U.S.C. § 1677(7)(F)(iii).

69/ Because the petition does not allege a subsidy and does not concern agricultural products, statutory factors (I) and (IX) are not applicable. Because Otsuka produces no other products subject to antidumping or countervailing duty investigations or orders, statutory factor (VIII) is also inapplicable.

70/ The basis for Otsuka's contrary assertions is unclear. We intend to generate more detailed information as to the nature of Otsuka's Japanese operations during any final investigation.

71/ Statement of Andrew Blow; Tr. at 162 (Blow); Wyatt Postconference Brief ex. F (magazine advertisement for Otsuka instrument).

72/ Commissioner Rohr notes that Wyatt has alleged that Polymer's marketing efforts on behalf of Otsuka have specifically targeted Wyatt. See Petition ex. 4, a document making certain comparisons between the Otsuka and Wyatt multi-angle LLSIs. Otsuka and Wyatt dispute the function of the document, which Wyatt terms a "competitive sales document" and Otsuka describes as an academic paper. He believes that Wyatt's allegation merits further investigation.

Otsuka sales increase would likely have a multiplier effect in light of the large role played by repeat sales to corporate customers and the importance of word-of-mouth recommendations in influencing purchase decisions. 73/ In light of the structure and size of the domestic market for the like product, Otsuka's probable market share increase supports a reasonable indication of threat.

This is especially so because of Otsuka's pricing practices. The list price of the Otsuka instrument is below that of comparably equipped U.S. instruments. 74/ Otsuka has also offered and entered leasing agreements with options to buy for its multi-angle LLSI on terms more favorable than those that Wyatt currently offers. 75/ The record thus indicates that Otsuka is attempting to acquire U.S. market share by underselling domestic producers. This makes price depression or suppression by domestic producers who must meet Otuska's competition probable. 76/ Price suppression would in turn limit the amount of revenues that domestic producers could devote to the research and development expenditures needed to stay competitive in a high-technology industry. 77/

73/ See Report at A-33, A-40.

74/ Report at A-38. See also Report at A-40.

75/ Report at A-41; Tr. at 85 (G. Wyatt). We have considered these leasing practices because they are relevant to the terms and conditions under which the instruments are offered for sale.

76/ Commissioner Lodwick considers Otsuka's offering of attractively priced machines through allegedly LTFV prices as a basis for either or both price suppression and lost sales in the future. He will further explore the characteristics of this market to determine whether increased import volumes are likely and whether such sales will suppress domestic prices.

77/ The same result would occur should the domestic producers maintain prices at the expense of market share.

There is no indication that Otsuka has substantially increased its inventories of multi-angle LLSIs. 78/ LLSI producers, however, generally do not maintain inventories. 79/

We believe that the factor of underutilized capacity, the information concerning which is also confidential, warrants further investigation. 80/ Moreover, nothing in the current record demonstrates that Otsuka's intention to commence U.S. production operations will not serve to free capacity in Japan. Otsuka could create free capacity in Japan for production of either the multi-angle instrument it currently markets, or, potentially, a new multi-angle instrument model by shifting production of other instruments to the U.S. 81/ 82/ Consequently, we cannot conclude that there is no likelihood that we could not obtain evidence in a final investigation indicating underutilized capacity in Japan.

78/ See Testimony of Andrew Blow; Report at A-28.

79/ Report at A-20.

80/ Report at A-30.

81/ We acknowledge that such action would be contrary to Otsuka's stated intention of satisfying all U.S. demand for its current model multi-angle LLSI from its planned U.S. facility. Nevertheless, the record simply fails to establish that Otsuka has made an ironclad commitment to U.S. production of its multi-angle instrument. The material that Otsuka has presented to the Commission on this issue indicates merely that Otsuka plans to establish a U.S. production facility which can be used for the production of the multi-angle LLSI, but can also be used for production of other instruments. Moreover, Otsuka has yet to hire or train any employees in the U.S. for production of its multi-angle instrument and has yet to make any capital expenditures for equipment dedicated for use in production of that instrument.

82/ Commissioner Lodwick notes that more information needs to be developed regarding Otsuka's new distributor Polymer's investment in developing the U.S. market and whether Otsuka's U.S. production facilities will facilitate an increase in allegedly LTFV imports of the product subject to investigation or replace them.

Even if Otsuka's U.S. production facility permits it to stop importing finished multi-angle LLSIs from Japan, it has indicated that it will continue to import at least one LLSI component under investigation, the optical bench. 83/ This raises another issue that we believe should be investigated further in a final investigation, in which we will seek to obtain additional information about the domestic parts industry.

We also note that the structure and size of the market for the product under investigation affect an evaluation of the threat imposed by Otsuka's allegedly LTFV imports. We have noted that because of the high price and low volume of sales, the sales of even a relatively small number of LTFV imports would have a serious negative effect on the existing development and production efforts of this industry to continue to develop more advanced LLSIs. Further, Otsuka's price promotion activities have the potential in reducing the amount of funds the domestic industry can devote to research and development activities. This appears to be the situation envisioned by Congress when it added factor (X) to the statutorily mandated list of threat factors for the Commission to consider in the Ominbus Trade and Competitiveness Act of 1988.

Finally, there do not appear to be any dumping findings or antidumping orders in effect in third countries with respect to classical LLSI imports from Japan. 84/

Enough information exists to satisfy the low threshold needed to warrant an affirmative finding in this preliminary investigation. Although

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83/ Tr. at 158 (Nakayama).

84/ Tr. at 166.

the current record contains scant material with respect to a number of threat factors, such as capacity increases and unused capacity, we cannot state there is no likelihood that we will not be able to obtain contrary evidence concerning these factors in a final investigation. Accordingly, we conclude that there is a sufficient basis for an affirmative determination in this preliminary investigation.

Additional Views of Commissioner Eckes

My affirmative preliminary determination of a reasonable indication of a threat of material injury results necessarily from the incomplete nature of the record and the resulting large number of unanswered questions.

It is unclear to me at this stage what constitutes the appropriate like product. The merchandise subject to investigation is unusually complex, both in its characteristics and uses, and results from the application of emerging technologies. In my view, legitimate legal and factual questions remain and warrant further consideration.

More attention needs to be devoted to the role of parts and components. It appears that a relatively small number of parts, which incidentally are custom-made for domestic producers, account for a disproportionate share of material costs. Because in some ways domestic producers appear to be assemblers or fabricators, the Commission needs to seek additional data from domestic component suppliers who may also be affected by alleged LTFV imports of both complete machines as well as parts and components.

It is important to note that the Commission does not have complete economic data on all producers. In particular, the profit-and-loss information for one producer is not available.

For this Commissioner, this investigation also raises several important and novel questions of fact and law. In this industry, unlike many others I have encountered in nearly nine years at the

Commission, exports are a substantial and growing share of total industry sales. As a factual matter, it is unclear how these export sales impact on the industry's profitability and affect its ability to recover fixed costs and fund ongoing research and development. As a matter of law, it is also unclear whether the Commission is required in applying the statute to assess the condition of the domestic industry only on the basis of domestic sales. In my view, these factual and legal issues require more careful investigation and discussion.

My threat determination also focuses on the future impact of alleged LTFV sales on the domestic industry. Because research and development are essential to the configuration of this product, the Commission must give careful attention to the ability of the domestic industry to recover R & D costs.

In this market, as with some other complex products, the initial sale for a producer is important, because a purchaser tends to follow up the initial order with parts and components and more advanced models. It is apparent that both domestic and foreign producers have a keen interest in making the initial sale. There have been recent instances of underselling by the subject imports, some of which involve sales of demonstration models at reduced prices. The Japanese producer takes an active role in important trade shows in this country, and has in place the necessary marketing structure to make additional sales.

There is another issue that requires more study in a final investigation: the foreign producer's commitment to producing the merchandise under investigation in the United States. Does the

Japanese producer contemplate producing all models sold in the United States in this country? Given the rapid development of new models, will they too be produced in the U.S.? The Commission must also look at how the scope of any possible antidumping order would affect the importation of high-value parts and components and their impact on the domestic industry. Finally, more information should be obtained about the allocation of space and commitment of resources within any proposed domestic facility for the production of the item under investigation.

In summary, I find that the application of the American Lamb standard requires an affirmative determination in this investigation. Consequently, I determine that this record as a whole does not contain clear and convincing evidence that there is no reasonable indication of a threat of material injury, and that there is likelihood that contrary evidence will arise in a final investigation.

DISSENTING VIEWS OF CHAIRMAN ANNE E. BRUNSDALE

Certain Laser Light-Scattering Instruments and Parts Thereof from Japan
Inv. No. 731-TA-455 (Preliminary)

May 3, 1990

I dissent from the Commission's determination that the record in his case reveals a reasonable indication of material injury or threat thereof to a domestic industry by reason of unfairly priced imports.[1] Indeed, petitioner fairly concedes that imports of multi-angle laser light-scattering instruments (LLSIs) and parts thereof have no present material impact on the U.S. LLSI industry.[2] Moreover, on the record before the Commission, any suggestion that the imports under investigation threaten the domestic industry with material injury is highly speculative.[3]

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[1] I concur in the majority's conclusions regarding like product and domestic industry. Material retardation of the establishment of an industry in the United States is not an issue in this case.

[2] Petitioner stresses that the Japanese market share "will" increase and that such an increase "will" cause material injury to the domestic industry. Petition at 14. Petitioner later notes that, "[a]lthough it has not happened yet, . . . there could come a time when a potential customer, interested in purchasing the petitioner's product, could choose the Japanese instrument unless the petitioner lowered its price." Id. at 15.

[3] As I have stated in the past, the proper approach in evaluating the statutory "reasonable indication" standard in a preliminary determination is that set forth in American Lamb Co. v. United States, 785 F.2d 994 (Fed. Cir. 1986). The court in that case stated that a negative preliminary determination is appropriate where "(1) the record as a whole contains clear and convincing

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Current Impact and Future Threat

In a recent case, I outlined in detail my views on the proper analysis of threat in a dumping or countervailing duty investigation. After listing the statutory factors to be analyzed in every threat determination,[4] I observed:

> These factors fall into two categories, one bearing on the likelihood that the foreign industry will sustain or increase its penetration into the United States market (including inquiry into the nature of any subsidies), and the other concerning the sensitivity of the domestic industry to those imports. As the legislative history [of the threat provision] suggests, these factors do not constitute a checklist. Congress has provided no normative criteria for elevating one factor over another and the statute does not set out the combinations of factors that will amount to a threat. The factors are guides designed to keep the Commission focused on the proper question: will future imports materially injure the domestic industry?
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> The standard for that determination is high. The decision must be based on evidence that 'the threat of injury is real and that actual injury is imminent' [citing 19 U.S.C. § 1677(7)(F)(i)]. The decision may not be based on 'mere conjecture or supposition' [citing 19 U.S.C. § 1677(7)(F)(ii)]. As the Commission's reviewing court has ruled, the mere possibility of future

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[3](...continued)
evidence that there is no material injury; and (2) no likelihood exists that contrary evidence will arise in a final investigation." Id. at 1001. As I have stated in the past, the import of American Lamb is that the Commission should issue a negative determination "either because the evidence supporting the allegations in the petition does not amount to a reasonable indication of [material] injury" or because the contrary evidence is so clear and convincing that any evidence supporting the petition does not amount to a "reasonable indication." New Steel Rails from Canada, Inv. Nos. 701-TA-297 and 731-TA-422 (Preliminary), USITC Pub. 2135 (November 1988) (Views of Acting Chairman Brunsdale) 55, 68 (emphasis in original).

[4] 19 U.S.C. § 1677(7)(F).

> material injury does not meet the 'real and imminent' standard set forth in the statute [citing Alberta Gas Chemicals, Inc. v. United States, 515 F. Supp. 780, 791 (Ct. of Int'l Trade 1981)].[5]

Because I conclude, first, that the impact of the subject imports on the industry to date is minimal and, second, that any substantial increase in that impact is speculative and far from imminent, I will set forth my analysis of present injury and future threat together.

The Minor Role of Japanese Imports. By any measure, the role of Japanese imports in the domestic LLSI market is minimal. Since the beginning of 1989, only two Japanese LLSI devices have entered the U.S. market -- one sale and one lease. This compares with total domestic shipments that are measured in the dozens. In value terms, the sale and the lease accounted for $****** in revenues, approximately * percent of the value of domestic producers' shipments.

I have noted in previous investigations that our analysis becomes easier when dealing with an industry that sells a few big-ticket items on a contract-by-contract basis.[6] That is especially true in this case where both of

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[5] Fresh, Chilled or Frozen Pork from Canada, Inv. No. 710-TA-298 (Final), USITC Pub. 2218 (September 1989) (Dissenting Views of Chairman Brunsdale and Vice Chairman Cass) 37, 75.

[6] See, e.g., Electrolytic Manganese Dioxide from Greece, Ireland, and Japan, Inv. Nos. 731-TA-406-408 (Preliminary), USITC Pub. 20976 (Additional Views of Vice Chairman Brunsdale, Commissioner Liebeler, and Commissioner Cass) 21, 25 & n.11. Such a record

(continued...)

the recent recipients of the Japanese LLSIs cooperated with the Commission and provided details regarding their purchasing decisions. In the only case of an outright purchase over the past 16 months, the purchaser originally placed an order for a domestic product. When problems arose with delivery, the purchaser cancelled the order and purchased a Japanese product. In the case of the lease, the purchaser tested a Japanese and a domestic product and ultimately chose the Japanese version because its standard features performed more of the particular functions necessary for that purchaser's specialized research.[7] In each instance, the controlling factor in the purchasing decision was not price.

I would reach the same conclusions even if I assumed that, given the large dumping margins alleged in the petition, "fairly" priced Japanese imports could not compete in the U.S. market.[8] As petitioner itself apparently concedes,[9] the present impact of those two sales on the fortunes of the industry would have been

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[6](...continued)
also tends to be more complete, which is necessary to make a definitive determination on injury even at the preliminary stage of the investigation. Id.

[7] Staff Report at A-40.

[8] This also assumes, of course, that the demand for LLSIs is relatively inelastic, that is, the same number of LLSIs would have been purchased at the prices charged by the domestic producers.

[9] See n.2, supra.

immaterial. In sum, whether I conclude that price was a critical factor in the decisions of the recent purchaser and lessor of the Japanese LLSIs, the Japanese imports under investigation have to date played only a minimal role in the domestic LLSI market.

The Likelihood of Future Material Injury. Taking recent Japanese activity in the domestic market as an indication that such activity is likely to continue into the future is a hazardous assumption. For example, the record contains evidence that at least one Japanese LLSI was sold in 1986, prior to the period of investigation.[10] We know, however, that none was sold in 1987, the first year of our three-year investigation period.[11] In short, the existence of sales in one year does not necessarily portend any sales, much less increased sales, in the future.

The record also suggests that the largest domestic consumers of LLSI technology -- primarily major chemical companies -- prefer to make repeat purchases from the same manufacturer. The training necessary to use an LLSI makes such repeat purchases more economical for the user.[12] Moreover, if a firm's research facility uses a particular LLSI in product development, its manufacturing arm is

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[10] Staff Report at A-40.

[11] Staff Report at A-31.

[12] Staff Report at A-17.

likely to use the same type of LLSI for production and quality control.[13] Inasmuch as domestic producers have made almost all domestic shipments to date, this propensity on the part of industrial users (at least) gives the domestic producers a decided advantage.

At the conference in this investigation, petitioner developed one additional threat argument. It noted that LLSI production is characterized by high fixed costs, particularly in research and development. Each sale, therefore, represents a substantial profit over variable costs and an ongoing contribution to capital formation and research and development. Petitioner suggests that future sales by the Japanese could cramp its research efforts and thus its ability to remain competitive in the market.[14] In its response to the Commission questionnaire on this point, petitioner contended that the imports have had no material impact on its existing development efforts but that petitioner anticipates such an impact in the future.[15]

I will assume for purposes of this opinion that an anticipated impact on research and development of future products -- as opposed to a present impact on current development efforts -- could meet the statutory requirement that the threat of injury be imminent. I conclude,

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[13] Staff Report at A-33-A-34.

[14] Tr. at 12-15.

[15] Staff Report at B-19.

however, that the evidence on this record does not establish the degree of imminence and certitude required by the statute. The concern about losing revenues needed to fund R&D is unfounded. In unit terms, the domestic producers' percentage of apparent U.S. consumption actually increased in 1989 despite the increase (from one unit to two) in Japanese imports. While the Commission does not have complete information on the value of the 1988 Japanese sale, the ********** in 1989 suggests strongly that the domestic industry's revenues ******* in 1989, both absolutely in light of the ********* ****** of apparent U.S. consumption and as a percentage of apparent U.S. consumption. In sum, any concerns about lost revenues seem, at best, premature.[16]

I have only one comment on the respondent's argument that Japanese imports pose no threat because of its plans to begin manufacturing LLSIs in the United States in the near future. I have in the past concluded that mere plans by a foreign industry to increase capacity is not in itself sufficient to constitute a threat to the domestic

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[16] With regard to the other statutory threat factors not specifically mentioned above, I conclude that they are either inapplicable (e.g. inventories of imports, rapid increase in market penetration) or must otherwise be found against petitioner on the record (e.g., the availability of underutilized capacity of the foreign industry).

industry.[17] Decisions of the Court of International Trade support this view.[18] It would be curious indeed if the prospect of foreign production were insufficient to constitute a threat but similar evidence regarding the prospect of domestic production could rebut the point. I therefore conclude that respondent's argument should be rejected as a matter of law.

Conclusion

For the foregoing reasons, I conclude that there is no reasonable indication that an industry in the United States is either materially injured or threatened with material injury by reason of unfair LLSI imports from Japan.

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[17] Certain Electrical Conductor Aluminum Redraw Rod from Venezuela, Inv. Nos. 701-TA-287 and 731-TA-378 (Final), USITC Pub. 2103 (August 1988) (Dissenting Views of Acting Chairman Brunsdale) 35, 54-55.

[18] See Alberta Gas Chemical, supra, 515 F. Supp. at 790-91.

DISSENTING VIEWS OF VICE CHAIRMAN RONALD A. CASS

Certain Laser Light-scattering Instruments
and Parts Thereof from Japan
Inv. No. 731-TA-455
(Preliminary)

I dissent from the Commission's affirmative determination in this preliminary investigation because I find that there is no reasonable indication that the domestic industry has been materially injured or threatened with material injury by reason of the allegedly less-than-fair-value ("LTFV") imports of multi-angle laser light-scattering instruments ("LLSI") from Japan that are the subject of this investigation. I join in the Commission's discussion of the like product and domestic industry, and in its discussion of the condition of the domestic industry to the extent that it accurately summarizes information relevant to my disposition of the Petition. I offer these Dissenting Views because my understanding of the legal standard applicable in preliminary investigations, and my approach to determining whether a domestic industry has been materially injured or threatened with material injury by reason of unfairly traded imports, differ substantially from that of certain of my colleagues.

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.[1] These statutory provisions require the Commission to determine, based on 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, or that the establishment of a domestic industry has been materially retarded by reason of such imports. 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.[2]

In other cases, I have discussed at 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 Appeals for the Federal Circuit in American Lamb Co. v. United States,[3] elaborating the evidentiary basis for preliminary determinations.[4] In my view, similarly extended discussion of

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

[2] See, e.g., Plastic Tubing Corrugators from Canada, USITC Pub. 2246, Inv. No. 701-TA-301 (Dec. 1989) (Preliminary) (Dissenting Views of Vice Chairman Cass); 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).

[3] 785 F.2d 994 (Fed. Cir. 1986).

[4] 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)

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these issues in this case is not necessary.

Although several discrete issues are subsumed within the legal standard, only one point is relevant here. Briefly, while Congress intended to "weight the scales in favor of affirmative and against negative determinations,"[5] the "reasonable indication" standard clearly was not intended effectively to rule out the possibility of negative determinations in preliminary investigations. The quantum of proof required to sustain an affirmative determination in a preliminary investigation is lower than that needed to support such a determination in a final investigation,[6] but the Commission must make sure that sufficient evidence exists to infer a reasonable possibility of an affirmative final determination. After all, the preliminary determination is intended to avoid the costly process of final investigations both by this Commission and by the Department of Commerce, and the attendant disruptive effect upon trade of such investigations, unless there is sufficient indication of injury

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[4](...continued)
("Telephone 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).

[5] 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).

[6] 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).

to a domestic industry to justify further investigation.[7] The Commission must weigh all the evidence and evaluate the likelihood that evidentiary gaps will be filled during a final investigation with information that would, in combination with other evidence of record, provide support for an affirmative determination.[8] This plainly requires attention to the underlying legal standard for disposition of final investigations, no less when we evaluate "threat" claims than claims of present injury. Here, I do not believe that the record contains sufficient evidence of either threatened or actual injury from dumped imports to support an affirmative decision.

II. DOMESTIC LIKE PRODUCT AND DOMESTIC INDUSTRY

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[7] The legislative history of the Trade Act of 1974, 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).

[8] See American Lamb Co. v. United States, supra, 785 F.2d at 1002-04. See, e.g., Yuasa-General Battery Corp. v. United States, cited, supra, at n. 5. 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).

A. Like Product

I concur, for the reasons stated in the Views of the Commission, with the Commission's conclusion that the relevant like product consists of all multi-angle LLSIs, whether they are goniometers or multiple detector instruments, including parts covered by Commerce's investigation made specifically for use in LLSIs. I am less certain that low-angle LLSIs are appropriately included in the like product in light of the limited functions of which they are capable, and agree with the majority that the issue should be reconsidered in any final investigation. The record developed in this investigation, however, contains so little evidence regarding the extent to which low- and multi-angle LLSIs compete in the same markets for the same consumers that it is almost impossible to determine whether they should be treated as separate like products. The Commission has relied heavily on evidence that the two products are distributed, priced, and sold in the same manner. In any final investigation the Commission and the parties should develop much more in-depth evidence regarding the degree of actual competition between these products.

III. REASONABLE INDICATION OF MATERIAL INJURY BY REASON OF LTFV IMPORTS

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,

(ii) the effect of imports of that merchandise on prices in the United States for like products, and

(iii) the impact of imports of such merchandise on domestic producers of like products . . . ."[9]

Subsequent provisions of the statute describe these three factors in greater detail.

The statute does not identify all of the factors relevant to an assessment of whether unfairly traded imports have materially injured a domestic industry. In fact, the statute explicitly contemplates that the Commission will consider relevant economic factors in addition to those described specifically in the statute.[10] The factors that are listed in the statute and the order in which they are listed nevertheless identify the essential elements of the inquiry that the Commission must perform. In particular, the laws makes three closely-related questions critical to an assessment of the possible existence of

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[9] See 19 U.S.C. § 1677(7)(B).

[10] 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.

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 consumption and production of the competing like product are both relevant to this question. The effects of dumping or subsidization on the prices of the imports are also important in this context, 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 at 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. In addition to evidence relating to the prices at which imports and domestic like products are sold, evidence bearing on three other issues is critical to assessment 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 regarding these products based on variations in the prices of these products.

Finally, we must evaluate the extent to which changes in demand for the domestic like product that were caused by unfairly traded imports affected the financial and employment performance

of the domestic industry and determine whether those effects are material.[11] In considering that issue, we must consider data relating to such factors as return on investment, the level of employment and employment compensation, industry capital and research expenditures, and so on.[12]

A. Volumes and Prices of the Subject Imports

During 1989 -- the period for which Petitioner calculated the alleged dumping margin -- only one Japanese LLSI of the type subject to this investigation was sold in the United States.[13] Similarly, only one of these LLSIs was sold in 1986, none in 1987, and one in 1988.[14] Because so few Japanese LLSIs have been sold in this country, and because each instrument sold (like the domestic like products) is priced individually based on the various options chosen by the purchaser, it is difficult to draw any inferences regarding the prices of the imports. The information gathered by the Staff, however, indicates that the domestic and imported models are priced similarly as of 1990. We do not have any information regarding changes in the price of the

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[11] 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 and Subassemblies Thereof from Japan, USITC Pub. 2150, Inv. No. 731-TA-390 (Final) 117-119 (Jan. 1989) (Concurring and Dissenting Views of Commissioner Cass).

[12] 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).

[13] Report at A-30.

[14] Id.

imports over time.

Viewed as a percentage of total domestic consumption of the like product (low-and multi-angle LLSIs), the volume of the subject imports during 1989 was quite small. Import market penetration during that period was only [***] percent in quantity terms and [***]percent in value terms.[15] The figures for Japanese import market share for the earlier years of the investigation are similarly low.[16]

These small import volumes, even if related to selling at LTFV prices at the margins calculated by Petitioner, are strongly at odds with causation of material injury by reason of dumping. To be sure, the evidence before the Commission in this preliminary investigation compels an inference that the prices of the subject imports have declined substantially as a result of the dumping alleged by Petitioner. Petitioner alleges that these imports were sold at prices that were lower than fair value by margins ranging as high as 267 percent.[17] These margin allegations have not, of course, yet been thoroughly tested in proceedings before the Commerce Department. In Title VII preliminary investigations such as these, however, these alleged margins are the best evidence available to us, and we are, in my

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[15] Id. at A-32, adjusted to account for the actual volume of sales of the product under investigation as reported at A-30 and the price of the one 1989 sale as reported at A-39-A-40.

[16] Id.

[17] Report at A-15.

view, generally required to accept them as such.[18]

Dumping margins are not, in any event, conclusive of the effects of dumping on the prices of the subject imports.[19] In general, dumping margins (as alleged or as determined by Commerce) measure the difference between prices in two markets, but they do not constitute a precise measure of the extent to which the prices of subject imports declined as the result of charging different prices in the two markets (that is, as a result of dumping). In most cases, the actual price decrease in sales to the United States will be less than the full amount of the dumping margin.[20] In cases where, as here, the alleged dumping margins at issue reflect an assertion that the subject foreign producers/exporters have charged a lower price for their product in the United States than the price that they have charged in their home market (or another foreign market used as the surrogate for the home market), the actual decrease in the U.S. price of the subject imports that occurred consequent to dumping will be only a fractional percentage of the dumping margin. This percentage, in turn, will be in large measure a

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[18] See New Steel Rails I, supra, at 39-40.

[19] See, e.g., New Steel Rails I, supra, at 42; Granular Polytetrafluoroethylene Resin from Japan and the Netherlands, USITC Pub. 2112, Inv. Nos. 731-TA-385 and 386 (Final) 74 (Aug. 1988) (Additional Views of Commissioner Cass); Certain Bimetallic Cylinders from Japan, USITC Pub. 2080, Inv. No. 731-TA-383 (Final) 44 (May 1988) (Additional Views of Commissioner Cass).

[20] The reason for this is explained in 3.5" Microdisks and Media Thereof from Japan, USITC Pub. 2170, Inv. No. 731-TA-389 (Final) 82-89 (Mar. 1989) (Dissenting Views of Vice Chairman Cass). See also note 55, infra.

function of the proportion of the total sales of the subject foreign producer(s) in the U.S. and the exporter's home market (or other surrogate foreign market) that is accounted for by sales in the home market.[21]

Respondent's sales of LLSIs in its home market have in fact consistently and heavily outweighed its sales of such products in the United States.[22] Accordingly, for the purpose of this preliminary investigation, there is a plausible basis for

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[21] See, e.g., Certain All-Terrain Vehicles from Japan, USITC Pub. 2163, Inv. No. 731-TA-388 (Final) 58-60 (March 1989) (Additional Views of Commissioner Cass); Granular Polytetrafluoroethylene Resin from Japan and the Netherlands, USITC Pub. 2112, Inv, Nos. 731-TA-385 and 386 (Final) 74 (Aug. 1988) (Additional Views of Commissioner Cass); Certain Bimetallic Cylinders from Japan, USITC Pub. 2080, Inv. No. 731-TA-383 (Final) 44 (May 1988) (Additional Views of Commissioner Cass). The price decline in the United States will be a function both of the difference in competitive conditions faced by the dumping firm in the United States and in its home market and of the value to the firm of sales in each of those markets. The dumping margin, if properly calculated, reflects the first of these considerations, and the relative shares of sales by the firm in the two markets reflects the second (at least over the time frame relevant to our dumping investigations). For that reason, a proportional fraction of the dumping margin equal to the portion of the firm's combined U.S.-home market sales accounted for by sales to the home market will, by combining these two considerations, approximate the price change consequent to dumping.

In reality, an estimate of the decrease in the price of the dumped product that is derived in this fashion will be somewhat overstated as it represents an approximate upper bound of that decrease. For a thorough explication of this subject, see Office of Economics, Assessing the Effects on the Domestic Industry of Price Dumping, USITC Memorandum EC-L-149 at 1, n. 1, 13, 19-21 (May 10, 1988). A more accurate statement of the effects of dumping on import prices also may require some adjustment to reflect the fact that dumping margins are calculated on an ex-factory, rather than final sales price, basis. However, the evidence that would be necessary to make such an adjustment is not contained in the record here.

[22] See Report at A-30.

inference that the alleged dumping caused prices of the subject imports to decline by a very substantial percentage of the alleged dumping margins.[23] However, even if import prices decreased by this magnitude, given the other record evidence before us, there is no plausible basis for an inference that these price decreases induced importation of significant volumes of Respondent's products. As previously noted, import volumes during the period most closely corresponding to the time when dumping is alleged to have occurred -- 1989 -- were barely more than [***].

B. Effects on Domestic Prices and Sales

In determining the extent to which LTFV sales of the subject imports affected prices, and concomitantly sales, of the domestic like product, certain evidence in addition to the record evidence relating to import volumes must be considered. The law generally instructs us to evaluate price effects from dumped imports in light of evidence of significant price underselling of the domestic like product by the subject imports or of price suppression or depression. In this investigation, as will generally be true, the record evidence does not provide any reasonable indication of price underselling.[24] Although evidence

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[23] See note 55 supra and authorities cited therein.

[24] In asking us to look for the existence of significant price underselling (see 19 U.S.C. § 1677(7)(C)(ii)), Congress did not intend to equate that term with simple differences in observed prices. First, that concept would have been quite easy to articulate had that been Congress' intent. Second, that would not be a likely instruction from Congress, given the manifest

(continued...)

of price suppression or depression by dumped imports is presented to us with far greater frequency, there also is no reasonable indication of these effects in this investigation. Information respecting three issues is central to analysis of such price effects: the share of the domestic market held by the subject imports; 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.

The level of import market penetration is, as previously noted, quite small. During the period covered by our investigation that corresponds most closely to the time during which dumping is alleged to have occurred, the subject imports accounted for only [***]percent of the quantity and value of domestic consumption of LLSIs.[25] The evidence regarding the degree of substitutability between the domestic and imported

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[24](...continued)
irrelevance of such gross price differences to the effects of dumped imports on the U.S. industry making the competing domestic like product. As the Commission has recognized, the occurrence of price differences between imports and domestic products cannot provide a basis for inference of effects of dumping or of dumped 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). When adjustments for such differences are made, it is extraordinary to find price differences of more than a transitory duration. The common effect of price underselling, in most markets, will be depression of the like product's price. Reliable information on that effect will be more readily obtained.

[25] Report at A-32.

products is mixed. The best evidence that we have is that while both products are suited for general research and industrial uses, different purchasers select particular units with particular features based on the specific requirements of the tests to be performed. Thus the degree of substitutability varies among purchasers based on intended end use. Even assuming that the general degree of substitutability is fairly high, however, the minuscule number of sales of the Japanese model simply could not have caused significant price suppression or depression, or significantly affected the volume of sales, of the domestic like product.

C. Investment and Employment

The *** in sales, net profits, return on investment and productivity reported by the domestic industry over the period of our investigation, while not themselves indicative of the impact of imports, are consistent with the conclusion that imports have not caused material injury to the domestic industry. These are, I believe, generally discussed in the opinion of the Commission, and I will not separately describe them here. Only two firms, the Petitioner and the firm that produces low-angle LLSIs, reported financial data on their overall operations for their establishments in which LLSIs are produced. Petitioner's data indicate that not only did its net sales and profits *** steadily over the period of investigation, with a very substantial *** in 1989, it is receiving sufficient return on its investment to have *** its research and development expenditures between 1988 and

1989. These data provide no indication that imports may be impacting negatively on industry growth.

IV. REASONABLE INDICATION OF THREAT OF MATERIAL INJURY BY REASON OF ALLEGEDLY LTFV IMPORTS

Before reviewing the specific evidence of threat in this case, several observations regarding my approach to the evaluation of threat are appropriate here. It is important to understand the analysis of threat as a distinct inquiry, not merely an appendage to the analysis of injury from allegedly LTFV imports. This ground for relief addresses a particular factual context, where a clear threat of imminent injury from LTFV imports exists even though no significant effect has yet been felt. Because threat analysis requires prediction, an even less precise process than divination of past effects, it is important to describe carefully the basis of our analysis, else this becomes a very slippery tool.[26] That is particularly true in preliminary cases, where the evidentiary standard is lower than in final investigations.

When crafting the threat provisions of the statute, Congress signalled its concern that these provisions not be used as an escape valve from the remainder of Title VII. It noted in the legislative history that a

> determination of threat will require a careful assessment of identifiable current

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[26] Congress has specifically cautioned the Commission against making affirmative determinations of threat based on conjecture or supposition. 19 U.S.C. § 1677(7)(F)(ii).

> trends and competitive conditions in the marketplace. This will require the ITC to conduct a thorough, practical, and realistic evaluation of how it operates, the role of imports in the market, the rate of increase in unfairly traded imports, and their probable future impact on the industry.[27]

To ensure that the Commission would focus on information necessary to this determination, Congress set forth specific factors that, together with information obtained from examining the actual effects of dumped imports, should provide a sound basis for threat determinations:

> (I) if a subsidy is involved, such information as may be presented 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 [on Subsidies and Countervailing Measures],
>
> (II) any increase in production capacity or existing or 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 have a depressing or suppressing effect on domestic prices of the merchandise,
>
> (V) any substantial increase of inventories of the merchandise in the United States,
>
> (VI) the presence of unused capacity for producing the merchandise in the exporting country,

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[27] Conf. Rep. 1156, 100th Cong., 2d Sess. 174-75.

> (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 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 under [the dumping or countervailing duty laws] or to final orders . . . 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 . . . 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 . . . with respect to either the raw agricultural product or the processed agricultural product, but not both[,]
>
> (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.[28]

These factors fall into two categories, one bearing on the likelihood that the foreign industry will sustain or increase its penetration into the United States market (including inquiry into the nature of any subsidies), and the other concerning the sensitivity of the domestic industry to those imports. I understand the threat factors contained in the statute to require the same sort of integrated analysis presented above with respect to actual injury from allegedly LTFV imports. As the legislative

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[28] 19 U.S.C. § 1677(7)(F).

history cited above suggests, the factors are not a checklist of criteria that should be evaluated on a disaggregated basis, with an affirmative threat finding ensuing if a majority of statutory factors indicate a threat. Congress has provided no normative criteria for elevating one factor over another and the statute does not set out the combinations of factors that will amount to a threat. Rather, the factors suggest where we should look to see whether probable events over the near term will produce the sorts of effects on the domestic industry's prices and sales, and ultimately on its financial returns and employment, that would constitute material injury.

The standard for an affirmative threat determination is high. The decision must be based on evidence that "the threat of injury is real and that actual injury is imminent."[29] The decision may not be based on "mere conjecture or supposition."[30] As the Commission's reviewing court has ruled, the mere possibility of future material injury does not meet the "real and imminent" standard set forth in the statute.[31]

With these propositions in mind, I turn to the information of record in this investigation respecting the statutory threat factors. Because there is no allegation of subsidization in this case, and because this is a high-technology product for which

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[29] 19 U.S.C. § 1677(7)(F)(i).

[30] 19 U.S.C. § 1677(7)(F)(ii).

[31] Alberta Gas Chemicals, Inc. v. United States, 515 F. Supp. 780, 791 (Ct. Int'l Trade 1981).

there is no evidence of any possibility of product shifting as this is defined by the statute, I do not address the factors related to subsidization, agricultural products, or product shifting. The other factors of record uniformly indicate that there is no imminent threat from Japanese imports that would cause material injury to the domestic industry in the foreseeable future.

With respect to those factors that address the likelihood of the foreign industry to sustain or increase its penetration of the U.S. market, we have the evidence offered by Respondent that it is currently operating at very high capacity utilization in the production of its DLS-700 units and that it has no plans to increase its production of these units in Japan.[32] Even if we do not fully credit Otsuka's claim that it plans to transfer production of all DLS-700 models sold in the U.S. to Pennsylvania, there is evidence that Otsuka could not immediately employ the personnel necessary to increase the production of the DLS-700 in Japan.[33] Moreover, Otsuka's principal market is Japan, and the company's sales show no trend toward increased exports either to the U.S. or other countries.[34] Otsuka's projected sales in the U.S. for 1990 amount to two units (one unit has so far been leased in 1990), one more than the single

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[32] Report at A-29-A-30.

[33] Id.

[34] Id.

unit sold in 1989.[35] While facially significant as a percentage of prior years' U.S. sales, no meaningful information can be extracted from this predicted increase of only one unit.

Petitioner has not produced any more significant evidence that Otsuka is planning in the near future to increase its presence in the U.S. market through exports from Japan. As evidence of Otsuka's alleged strategy to take sales away from U.S. competitors, Petitioner cites the alleged dumping margins as evidence that Otsuka is attempting to become more price competitive than it has been in the past. Petitioner claims further that Otsuka has improved its ability to market the DLS-700 in the United States by obtaining Polymer Laboratories as its new U.S. sales representative, and that Polymer already has initiated a marketing campaign aimed at certain significant markets for LLSIs.[36] This is no more than speculation regarding Otsuka's intentions on the part of Petitioner, however, and does not amount to evidence of a real desire or ability by Otsuka to significantly increase exports to the United States over the near term.

With respect to those factors that address the sensitivity of the domestic industry to increased imports, I am limited in the inferences I can draw from the extent of the substitutability of the products and consumer price sensitivity given the thinness of the current record on these points. In the absence of

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[35] Id.

[36] Petitioner's Post Conference Brief at 19.

evidence that a rapid increase in imports is likely, however, I must draw the same conclusion with respect to the threat of injury that I have with respect to current injury. Should the current level of imports be sustained, it does not appear that the domestic industry would suffer material injury by reason of these imports. The fact that the domestic industry currently is receiving sufficient returns on its investment to maintain an active program of research and development and to expand production despite the entrance of some imports into the market further supports my conclusion that the domestic industry will not sustain future injury from current levels of the subject imports.

CONCLUSION

For the foregoing reasons, I determine that there is no reasonable indication that the domestic industry producing LLSIs has been materially injured or threatened with material injury by reason of LTFV sales of such LLSIs imported from Japan.

INFORMATION OBTAINED IN THE INVESTIGATION

Introduction

On March 19, 1990, a petition was filed with the U.S. International Trade Commission (Commission) and the U.S. Department of Commerce (Commerce) by Wyatt Technology Corp., Santa Barbara, CA, alleging that an industry in the United States is being materially injured, and is threatened with further material injury, by reason of imports from Japan of multi-angle laser light-scattering instruments and parts thereof that are alleged to be sold in the United States at less than fair value (LTFV). Accordingly, effective March 19, 1990, the Commission instituted antidumping investigation No. 731-TA-455 (Preliminary), under section 733(a) of the Tariff Act of 1930, 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 of such merchandise into the United States.

The statute directs the Commission to make its preliminary determination within 45 days after receipt of the petition or, in this case, by May 3, 1990. Notice of the institution of this investigation 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 March 23, 1990 (55 F.R. 10848).[1] Commerce published its notice of initiation in the Federal Register of April 17, 1990 (55 F.R. 14333).[2] The Commission held a public conference in Washington, DC, on April 11, 1990, at which time all interested parties were allowed to present information and data

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[1] A copy of the Commission's Federal Register notice is presented in appendix A.

[2] A copy of Commerce's Federal Register notice is presented in appendix B. Commerce's notice states that "The products covered by this investigation are light scattering instruments and parts thereof from Japan that have classical measurement capabilities, whether or not also capable of dynamic measurements. Subject LSIs employ laser light and may use either the single-angle or multi-angle measurement technique. The following parts are included in the scope of the investigation when they are manufactured for use only in an LSI: Scanning photomultiplier assemblies, immersion baths, sample-containing structures, electronic signal-processing boards, molecular characterization software, preamplifier/discriminator circuitry, and optical benches. LSIs may be sold inclusive or exclusive of such accessories as personal computers, cathode ray tube displays, software or printers. LSIs are used primarily for characterization of macromolecules and submicrons in solution."

Laser light-scattering instruments (LLSIs) are provided for in subheading 9027.30.40 of the Harmonized Tariff Schedule of the United States (HTS) (previously in item 712.49 of the former Tariff Schedules of the United States), a provision for electrical spectrometers, spectrophotometers and spectrographs using optical radiations. Parts of LLSIs are provided for in HTS subheading 9027.90.40, covering parts and accessories of electrical instruments and apparatus.

for consideration by the Commission.[3] The Commission voted on this investigation on April 30, 1990.

The Commission has not conducted a previous investigation on the subject products.

The Products

Description and uses

The imported products subject to the petitioner's complaint are multi-angle LLSIs and parts thereof that have classical measurement capabilities, whether or not also capable of dynamic measurements.[4] LLSIs are used primarily for the characterization of macromolecules and submicron particles in solution.[5] To make these determinations, light-scattering instruments direct a very fine, focused beam of laser light at a solution containing the particles of interest. Light passing through the sample, at one or multiple locations, is scattered after the beam strikes the dissolved or suspended particles. The instrument then detects how much light is scattered at different angles. By making light-scattering measurements from different angles and at different concentrations of the same sample, certain physical properties of the particles can be determined.[6] On the basis of these properties, researchers can determine the weight (mass) of the particles, their size, and how they interact with their solvent or solution.[7] They are

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[3] A list of the participants in the conference is presented in appendix C.

[4] Petition, p. 5.

[5] The terms macromolecule, giant macromolecule, and polymer are often used to designate high-molecular weight materials of either synthetic or natural origin and are important components of such materials as plastics, rubbers, fibers, latexes, and other natural and man-made substances. Macromolecules and polymers are complex molecules formed from a number of simpler molecules of the same or different sorts. Smaller molecules or submicron particles are made up of smaller, less complex molecules.

[6] Two principal characteristics that are obtained from such measurements are the intensity, or strength or amount of radiation, and the "spectral character," or spectrum of scattered light.

[7] This information is provided by the absolute molecular weight, the root-mean square radius, and the second virial coefficient. Molecular weight is the sum of the atomic weights of all of the atoms in a molecule, macromolecule, or other particle; the root-mean square radius, or radius of gyration, is the second movement of the size expansion of any molecule or particle and is usually used to measure the size of polymers, or other particles; and the second virial coefficient provides information that permits analysis of solvent/solution interaction. It is a chemical term that comes

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used by a variety of industries which include, but are not limited to, the chemical, petrochemical, pharmaceutical, and biotechnological industries for new product development, research and development, quality assurance, and quality control.

There are two types of LLSIs with classical measurement capabilities: single-angle and multi-angle. These two types of instruments, along with dynamic LLSIs (not within the scope of the investigation unless also capable of classical measurements), are discussed below. Within each type, there are various models of domestically-produced and imported instruments. For further discussion of differing features of the various models refer to the section of this report entitled "Price comparisons of instruments, software, and options."

Classical laser light-scattering instruments.--Classical LLSIs can be either single (low-angle) or multi-angle instruments. Classical LLSIs use the variation of total light-scattering intensity as a function of angle to make their measurements.[8] Single, low-angle LLSIs utilize detectors set at one, low angle to measure scattered light from a sample. In multi-angle instruments, one detector that moves around the sample cell (fig. 1), or an array of detectors spaced around the sample cell (fig. 2), collects the scattered light at multiple scattering angles. In some classical multi-angle instruments, a single detector is moved around the sample by a manually-

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[7] (...continued)
from a type of chemical thermodynamics and represents a measure of the interaction of a molecule with the solvent in which it has been dissolved.

[8] Size can also be determined by classical multi-angle light-scattering (but not by single, low-angle light scattering). Because light is a wave phenomenon, as macromolecules or other particles become larger, different parts of them become excited by different parts of the light wave striking them. This causes them to re-scatter the light from different physical locations on the particle. By the time the scattered light recombines at the detector, the different contributions may be out of phase in that they may cancel in certain directions, or add together in other directions. The result is that there is a variation of light as a function of angle. That variation depends solely on the size of the molecule or particle. For micromolecules, the molecule is so small that the different parts do not contribute enough to make a difference in angle, and the variation with angle is non-existent. The scattering in all directions is the same (Rayleigh scattering). But as the molecule, or particle of interest, gets larger (macromolecules, polymers) and interacts with different parts of the wave incident on it, interference occurs. This interference provides a variation of the intensity of light with angle and that variation, therefore, is directly correlated to the size of the molecules whose molecular weight has already been determined. The laser light-scattering instruments under study in this investigation are primarily used to measure macromolecules. Based on testimony by Philip J. Wyatt, Ph.D., and Frank E. Karasz, Ph.D., during the Commission's conference on Apr. 11, 1990, and from information provided to staff in telephone conversations with C.C. Han, Ph.D., and R.F. Chang, Ph.D., of the National Institute of Standards and Technology during the week of Apr. 2-6, 1990.

Figure 1
Multi-angle laser light-scattering instrument - scanning type

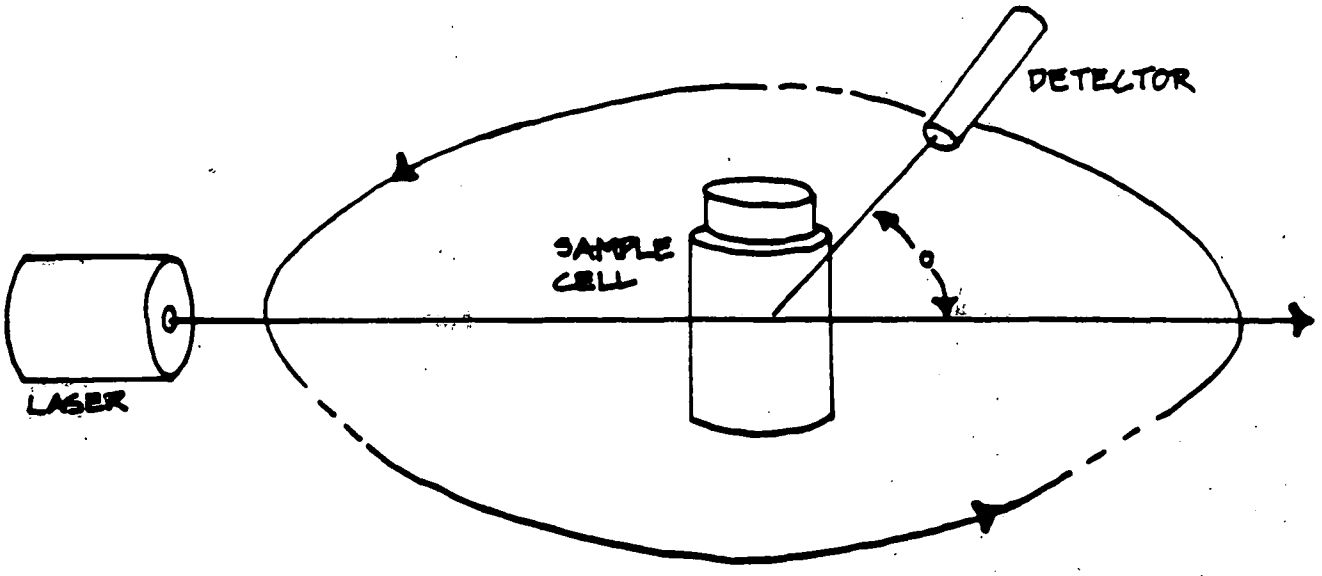
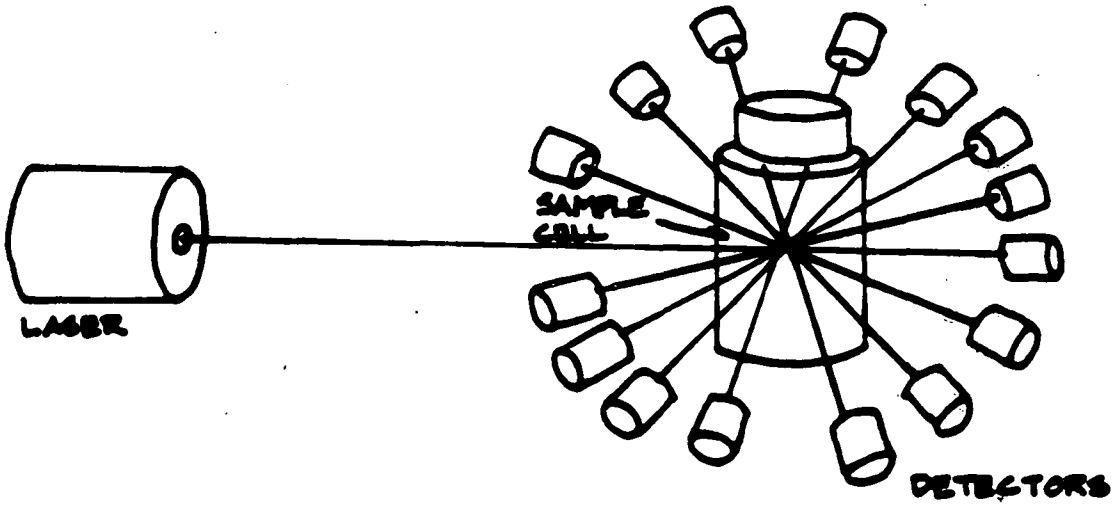


Figure 2
Multi-angle laser light-scattering instrument - fixed array type



Source: Wyatt Technology Corp.

controlled device, known as a stepper motor, to collect scattered light sequentially over many angles at many different locations. This instrument is sometimes referred to as a goniometer. In other instruments, rather than scanning the sample with a moving detector, a fixed detector array instrument is used which employs a number of discrete detectors placed at various locations around the sample. The detector array functions similarly to the single, moveable detector in that it also collects scattered light sequentially over many angles.

Measurements obtained by using classical multi-angle LLSIs are usually analyzed using a Zimm plot, or another calibration technique, which provides (1) absolute (weight-average) molecular weight, (2) the root-mean square radius, or average radius of gyration, and (3) the second virial coefficient.[9] Multi-angle laser light-scattering is purported to be the only absolute method of making such measurements without reference to standards over a broad range of molecules of various shapes, sizes, and weights.[10] The single, low-angle LLSI is similar to the classical multi-angle LLSI above except that it is used to determine molecular weight only. It cannot be used by itself to determine the size of a macromolecule or other particle since it is not capable of providing information on the root-mean square radius, or average radius of gyration of a particle.

Dynamic laser light-scattering instruments.--A dynamic LLSI uses the variation of light-scattering intensity as a function of time as the basis of its measurements.[11] One or more detectors (if only one detector is used, it

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[9] The Zimm technique is a mathematical algorithm for extracting this information from the measurements. There are other means of processing such data, but whatever the method used, in order to obtain such information in an absolute sense, one must have the absolute amount of light scattered at different angles, and the means to measure the variation with the angle of the scattered light. Extraction from such data is not difficult. The important thing is making the measurements that will serve as the basis for extracting the absolute molecular weight and size. This can only be done by light scattering. Based on testimony by Drs. Philip J. Wyatt and Frank E. Karasz at USITC conference on Apr. 11, 1990.

[10] Based on testimony at USITC conference on Apr. 11, 1990, and in interviews by USITC staff with industry officials during Apr. 2-6, 1990.

[11] These measurements are made possible by the instrument's capability of detecting shifts in the motion of molecules due to differences between frequencies in scattered light and the incident light beam generated by the laser. This shift, known as the Doppler shift, is similar to the phenomenon of the change in the sound of the whistle of a train as it approaches, then moves away from, a subject. A similar effect occurs with light. Because of molecular motion, some of the light scattered by solutions or dispersions of various substances from the incident light is shifted in frequency, and therefore wavelength (inelastic light scattering). Thus, the light scattered and the incident laser light are different in frequency and wavelength from one another. By measuring this Doppler shift, the motion of the particles can

(continued...)

is normally set at 90°) is used to collect scattered light.[12] A distinguishing feature of dynamic LLSIs is that they contain autocorrelators. In general, such instruments determine particle size, size distributions, and shape from measurements of the fluctuations in light-scattering intensity caused by the relative motion of the particles. To obtain this information, a photomultiplier tube counts photons, or units of light. Dynamic LLSIs are also sometimes referred to as quasi-elastic light-scattering instruments.

Classical and dynamic LLSIs are sometimes combined into a single apparatus to provide versatility and produce additional information on absolute weight and size characteristics of particles. Some LLSI systems are modular systems consisting of various assemblies spread out over an optical bench in what is known as an open architecture. Other LLSIs are contained in a box or in a cabinet that prevents ambient light from entering. Such self-contained instruments can be operated in a room with the lights on and where other people are working.[13] Self-contained units may incorporate both classical and dynamic elements as a built-in feature of their componentry, whereas other instruments may have modular designs which permit the attachment of an autocorrelator to a classical instrument to allow for dynamic capabilities.

Although various LLSIs generally operate on the basis of the same principles and have many of the same applications, their physical makeup and componentry may differ. For example, LLSIs utilizing a fixed-detector array for detecting the scattered light do not require the stepper-motor required in the goniometers. The goniometer also usually requires other moving parts not

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[11] (...continued)
be determined. Further, if one knows the temperature of the solution in which the particle is contained, the viscosity of the liquid can be determined. Because large objects, or particles, move more slowly through a liquid than smaller ones, knowledge of the viscosity of a solution, and the velocity of the particles moving through the solution, can be used to determine the size of the particles in question. Thus, dynamic laser light-scattering is a means for deriving the size of particles by the measurement of inelastic light-scattering. Based on testimony by Dr. Philip J. Wyatt at USITC conference on Apr. 11, 1990.

[12] In exhibit B of the postconference brief on behalf of Otsuka Electronics Co., Ltd., Dr. Frank Karasz states that "While it is technically correct that under optimal conditions measurements at a single angle can provide information about the diffusion of the scattering polymer molecule which can be related to its size, the assumptions involved in doing so are severe. It is far preferable in terms of reliability and precision to make measurements at a series of angles."

[13] The producer of a multi-angle laser light-scattering system of the open-architecture type states that such systems also are capable of operating in open, lighted rooms when provided with narrow band interference filters that are installed in front of the photomultiplier. Letter dated Apr. 12, 1990, to the Secretary of the U.S. International Trade Commission, from Dr. Walther Tscharnuter, President, Brookhaven Instruments Corp.

needed in the fixed-array instrument. Also, some instruments use very sensitive photomultiplier tubes for their detectors, and others use photodiodes to detect the scattered light.[14] Some systems include filters to correct for undesired fluorescence; others do not.[15] The sample-containing structure often differs in design depending on whether the instrument is to be used as a stand-alone instrument or whether it is to be used in connection with another analytical procedure such as chromatography.[16] Finally, multi-angle LLSI systems may be sold inclusive or exclusive of such accessories as personal computers, cathode ray tube displays, software, or printers.

Parts and components.--Components and parts of LLSIs include, but are not limited to, lasers, scanning photomultiplier assemblies, photodiodes, stepper motors, immersion baths, sample-containing structures, electronic signal-processing boards, preamplifier/discriminator circuitry, analog-to-digital converters, thermocouples, optical benches, and software packages designed for use in laser light-scattering instruments.

The lasers used with light-scattering instruments are light sources capable of producing a single frequency of light at high intensity in the optical region. This is important for light-scattering measurements since they involve the measurement of light at a single wavelength. Prior to the commercialization of lasers, light-scattering utilized mercury lamps that produced a spectrum, or number of different wavelengths, in their discharge. Such light sources were difficult to use and required filtering undesired wavelengths to perform light-scattering measurements. Because they are monochromatic (produce light at a single wavelength), lasers are easier to use in such measurements. Most LLSIs incorporate a helium-neon laser, which produces a red light (a particular wavelength). However, other lasers may be used on most instruments. One more-expensive variation sometimes incorporated in LLSIs is the argon-ion laser, which produces green or blue light as an alternate wavelength, depending on the application or precision required by the users. Other lasers could also theoretically be used with light-scattering instruments.

Multi-angle LLSIs incorporate either photomultiplier tubes or photodiodes as detectors. Photomultiplier tubes are always incorporated in instruments that perform dynamic light-scattering functions since such dynamic (or autocorrelation) measurements require greater sensitivity and the counting

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[14] See section on parts and components for a description of photomultipliers and photodiodes.

[15] Fluorescence occurs when particles or polymers themselves emit light at a different (or sometimes the same frequency) as the scattered light of interest. Such fluorescence can interfere with the intended intensity measurements. Filters have been developed to filter out undesired frequencies to correct for this phenomenon.

[16] See section on substitute products for a description of chromatography.

of each photon of scattered light.[17] Instruments that perform classical measurements only may incorporate either photodiode detectors[18] or photomultiplier tubes. Single photomultiplier tubes are sometimes incorporated into assemblies for scanning around a sample-containing structure to make light-scattering measurements at multiple angles at different locations.

Stepper motors are motors that rotate in short and essentially uniform angular movements. They are often used to move the scanning photomultiplier tube around the sample in moveable-type detector systems used in classical light-scattering applications.

An immersion bath is a solution or solvent at a constant temperature in which the cell containing the substance or material of interest is immersed for performing the light-scattering applications. The sample-containing structure is a cell, cell holder, or flow tube designed to hold the samples that are being examined.

Electronic signal processing boards are subassemblies containing the electronic componentry configured in a manner to perform the various functions of the light-scattering applications and measurements of a particular light-scattering instrument. A preamplifier is an amplifier whose primary function

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[17] Photomultipliers are devices that make use of the phenomena of photoemission and secondary-electron emission in order to detect very low light levels. Photoemission is the ejection of electrons from a substance as a result of radiation falling on it. The electrons released from the photocathode by incident (source) light are accelerated and focused onto a secondary-emission surface called a dynode. Several electrons are emitted from the dynode for each incident primary electron. These secondary electrons are then directed onto a second dynode where more electrons are released. The whole process is repeated a number of times depending upon the number of dynodes used (the overall effect is known as the "cascade effect"). In this manner, it is possible to amplify the initial photocurrent by a factor of 10^8 or more in practical photomultipliers. Thus, the photomultiplier is a very sensitive detector of light. In exhibit A of Otsuka's postconference brief, Dr. Karasz states that "the discrete pulse output of the photomultiplier detector is essential to the autocorrelation techniques basic to dynamic mode light scattering instruments."

[18] A photodiode is a semiconductor diode in which the reverse current varies with illumination. The light scattered by the sample changes the illumination of the photodiode detector. The changes in illumination (which is a type of light energy) are converted to changes in electrical energy. The sensitivity of photodiode detectors can be strengthened by using them with amplifiers, as does the petitioner in this investigation. In Wyatt's postconference brief (pp. 3-4), the firm maintains that "the efficiency of the DAWN photodiodes to convert a single photon into an electron is far greater than that of the LDS-700's photomultiplier tube. When coupled to the amplifiers that are built into every one of the DAWN's detectors, the DAWN photodiodes produce an output signal *at least as sensitive* as that of the DLS-700 photomultiplier using a laser producing red light."

is boosting the output of a low-level signal, low-level audio-frequency, radio-frequency, or microwave source to an intermediate level so that the signal may be further processed without appreciable degradation of the signal-to-noise ratio of the system. A discriminator is a circuit in which magnitude and polarity of the output voltage depends on how an input signal differs from a standard or from another signal. Analog-to-digital converters are devices that translate continuous analog signals into proportional discrete digital signals.

Thermocouples are thermoelectric couples used to measure temperature differences, or to convert radiant energy into electric energy. They are often used in classical light-scattering instruments used in quality-control applications.

Optical benches are base structures used for attaching various optical components used in a particular system or assembly. In light-scattering instruments optical benches often consist of a rigid horizontal bar or track for holding optical devices. The optical bench is critical for accurate illumination of the sample and allows the positions of devices to be changed and adjusted easily.

Computer software consists of the proprietary programs and instructions used to perform the necessary calculations and provide the information on molecular weight, size, and configuration from the measurements resulting from laser light-scattering techniques. They usually come as part of multi-angle laser light-scattering systems. Computer hardware such as the microcomputer, keyboard, and printers may or may not be offered as accessories to the system.

Uses.--LLSIs are used as either batch-type or continuous flow instruments. In batch-type measurements, a sample of a solution containing the substance or particles of interest is placed in a sample-containing structure, or cell, through which the laser beam is directed. Once the desired measurements are obtained, the sample is removed and replaced with another sample. This process continues until all of the desired samples have been characterized. Flow-through instruments permit the continuous monitoring of sample solutions flowing through a long tubular sample-containing structure or flow cell.

Batch-type measurements are much slower to use but permit measurements to be made on particular samples readily, and at different concentrations. Flow-through LLSIs, however, are able to provide the light-scattering characteristics of a large volume of solution and facilitate the measurement of molecular weight distribution of the sample. Classical flow-through LLSIs (both single- and multi-angle instruments) are often used as detectors in connection with chromatographic processes to perform process and quality-control functions. However, according to some industry officials, such instruments may also be used for batch-type measurements.[19]

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[19] Based on USITC staff interviews with industry officials during Apr. 2-6, 1990, and on testimony provided at USITC conference on Apr. 11, 1990.

LLSIs are analytical instruments with numerous applications in basic and applied research, including quality control and product development. They are often used by chemists, physicists, biologists, and other scientists in university, medical, and industrial laboratories. They are also used by engineers and technicians in industry for commercial applications, such as process and quality control, and in advanced research for the development of new materials.

Dynamic light-scattering measurements are particularly useful for researchers who are interested primarily in particle size. They are most useful when a researcher is working with known molecules and he wants to confirm that they are there. However, researchers who know little about the particles in the substance or solution of interest or who are interested in other molecular characteristics, such as solvent/solution interaction, or the distribution of mass within a molecule,[20] require classical light-scattering instruments to perform these measurements.

In many cases, researchers require both classical and dynamic light-scattering capabilities for their needs. Although dynamic light-scattering techniques are chiefly concerned with determining the size, and classical techniques with determining the absolute molecular weight and the molecular weight distribution of macromolecules, many researchers desire information on both size and weight. Knowledge of the size of a particle (from dynamic light-scattering) can also help researchers verify absolute molecular weight determinations made using classical laser light-scattering means. Therefore, many researchers acquire separate instruments dedicated to classical and dynamic light-scattering measurements, or purchase an apparatus with combined classical and dynamic light-scattering capabilities. Larger laboratories often have several different laser light-scattering instruments to address different applications. Smaller laboratories or university research laboratories are more likely to possess one system combining classical and dynamic capabilities.

Practical applications for laser light-scattering have been particularly evident in the petrochemical, pharmaceutical, and latex industries where they have been used for quality-control and for new product development. The size and characteristics of particles in latex paint, for example, will determine its color, glossiness, viscosity (thickness), and consistency. Dynamic laser light-scattering techniques permit quality control technicians to make sure that they have the correct combination of input materials and that they have no unwanted particles. Light-scattering is similarly used in new product development to determine the characteristics of new or improved paint or other products.

Other latex products for which classical and dynamic laser light-scattering particle characterization has been used include adhesives, coatings, rubber, and plastics. New adhesives, for example, have been developed for composite materials that have replaced the rivets for holding

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[20] This is usually referred to as molecular-weight distribution, which is the frequency of occurrence of the different molecular-weight chains in a homologous polymeric solution.

together aircraft parts such as wings. Laser light-scattering has been instrumental in the development of such new materials because of its ability to measure the structural characteristics of the new materials.

Researchers in the petrochemical and plastics industries have been especially interested in classical laser light-scattering methods in new product development and quality control. Contact lens manufacturers, for example, are interested in the molecular weight distribution of polymers (determined by classical means) in lens materials since such a parameter can be used to predict the strength or brittleness of the lenses. Classical LLSIs have also been used extensively by firms that manufacture plastics like polypropylene or polyethylene (plastic bags).

Biotechnology research has also benefited from laser light-scattering techniques. Researchers in this area are particularly interested in dynamic light-scattering applications because of their interest in the size and shape of macromolecules in biological substances and materials such as proteins. For example, certain types of molecules form contact spheres.[21] The most prevalent material used in this application, polystyrene latex, is utilized in many types of medical applications where the spheres themselves are employed as a substrate on which reagents are attached. Those manufacturers who are manufacturing the spheres for subsequent incorporation into medicines or into reagents must know the size of these spheres and use dynamic light-scattering to determine it. Laser light-scattering is also used to characterize the size and weight of the lattices of polystyrene coatings used in drug delivery systems. The size of the lattices in these coatings is important in determining whether drugs can be efficiently delivered into the body. Other uses of light-scattering in the biotechnology field include the sizing and characterization of particles in liposomes and blood.

LLSIs are used for pure research by physicists, chemists, engineers, and technicians in academic and basic research laboratories (such as Bell Laboratories) in both the private and public sectors. Biochemists, for example, use light-scattering instruments in their basic research on colloidal particles and systems. Physical chemists and physicists use classical and dynamic light-scattering techniques to study the complex interaction and characteristics of macromolecules and other particles, and the complex materials and substances they make up. Finally, some physicists use LLSIs to study the properties, characteristics, and principles of light-scattering itself.

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[21] Contact spheres are spherically shaped particles which cause resins or materials in which they are contained to thicken or polymerize on heating. Contact resins are often used for bonding laminates because they require little or no pressure for adherence.

Substitute products

Industry officials and research scientists state that there are no close substitutes for LLSIs.[22] This is because there are no other instruments that provide information on the absolute molecular weight, size, and various other characteristics of particles without reference to other standards.

Experts state that there is much misunderstanding about these instruments because they are often referred to and classified in industry and trade statistics with other electrical instruments for physical and chemical analysis such as spectrometers, spectrophotometers, and spectrographs. However, although LLSIs do measure spectral characteristics of light, they operate at a single wavelength and make measurements of scattered light at angles. Spectrophotometers and other similar spectral instruments, however, are usually concerned with the measurements of the absorption (or nonabsorption) of light energy and have the capability of making measurements at different wavelengths. Spectrophotometers and similar spectral instruments are usually used to identify the molecular composition and structure of materials with respect to known standards. LLSIs, on the other hand, are used to characterize the particle size, absolute molecular weight, and other characteristics of macromolecules, polymers, and other particles.

Two other techniques that are also used in determining molecular weight and size are gel permeation chromatography (GPC) and viscometry. However, the measurements from these techniques are derivative measurements based on comparisons with other standards. GPC and viscometry are often used in conjunction with low-angle and multi-angle classical LLSIs, which provide them with the absolute measurements which serve as the standards for the derivative measurements they are concerned with. Thus, classical laser light-scattering is often complementary to GPC and viscometry.

Multi-angle LLSIs often serve as detectors to GPC apparatus. GPC is a separation process in which polymers or particles of interest contained in a gel-like substance are separated as the substance flows slowly through a gel contained in a tube in an on-line process. Due to this separation, each portion of the substance can be looked at with laser light-scattering. GPC is often used with classical low-angle and multi-angle light-scattering to perform commercial quality-control functions.

Viscometry is a method for determining certain hydrodynamic properties of molecules which cannot be determined by classical or dynamic multi-angle laser light-scattering. Often, light-scattering is combined with viscometry to provide more information about macromolecules, polymers, or other particles of interest.

Another light-scattering used for physical and chemical analysis is electrophoretic light-scattering, or electrophoresis. However, industry

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[22] USITC staff interviews with industry officials and telephone conversations with research scientists at the National Institute of Standards and Technology during Apr. 2-6, 1990. Also based on testimony at USITC conference on Apr. 11, 1990.

officials and researchers state that this type of light-scattering has little relationship to the measurements or functions performed by classical LLSIs. The technique involves the migration of molecules in the presence of electrical fields. To perform electrophoresis measurements, high voltages and special cells are required that are not normally sold with traditional laser light-scattering equipment.

Manufacturing processes

The LLSI industry is highly technical and research-intensive. In many cases, the manufacturing facilities are owned or managed by highly trained physicists or other scientists with many years of experience in the field of light-scattering. These scientists are generally intimately involved in designing and managing the production of the light-scattering instruments. Many of their employees are engineers, chemists, computer experts, or highly trained technicians. The required software packages to generate molecular weight and/or size information for the systems are primarily produced in-house.

Multi-angle LLSIs are systems which combine a number of subassemblies[23] and many component parts, mostly machined component parts. The majority of the component parts are off-the-shelf items. Each system is made up of a computer and software, and subassemblies and component parts that may include all or part of the following elements: scanning photomultipliers, stepper motors, photodiode detectors, laser devices, optical benches, autocorrelators, thermocouples, electronic signal processing boards, preamplifier/discriminator circuitry, photometers,[24] cells and cell holders, analog-to-digital converters, and cabinets.

The level of in-house and outside acquisition of subassemblies and component parts differs among producers. However, the bulk of the subassemblies and component parts, including laser devices, photodiodes, and photometers, are purchased from outside sources. All subassemblies and component parts purchased from outside sources must conform to the purchaser's specifications whether or not the product is an off-the-shelf item or specially manufactured for the purchaser.[25] Because a high percentage of the subassemblies and component parts are bought from outside sources, the production processes consist principally of assembling and interconnecting the various subassemblies and component parts, and conducting tests during and after the assembly of the product. Due to the labor-intensive nature of the assembly process, capacity can generally be expanded easily to meet increased

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[23] A subassembly is a structural unit, which although manufactured separately, is designed for incorporation with other parts or subassemblies in the final assembly of an instrument or system.

[24] Photometers are instruments for making measurements of light or electromagnetic radiation.

[25] In its postconference brief (p. 20), Wyatt states that * * *.

demand without the need to purchase a significant amount of new capital equipment.[26]

The assembly processes for the various types of LLSIs and systems do not differ greatly, with the exception that some of the subassemblies and component parts are different. The first step in the assembly process is the in-house assembly of subassemblies. This is generally done apart from the final assembly.

The optical bench is usually designed in-house and determines how the LLSI system will function as a whole and often differentiates it from other LLSIs.[27] The assembly of the integrated optical bench is one of the most important subassemblies that is completed in-house. Industry officials indicate that the proper assembly of the integrated optical bench is of critical importance and requires highly experienced employees. The solder joints must be of high quality and the leads must be shielded and of the specified lengths.

The proper assembly of the laser to the laser mount is also of great importance and is done by a highly experienced technician. The precise mounting of the laser to the laser mount must assure that the laser beam is directed straight and parallel to the bore of the cell holder.

The assembly of the electronic subassembly generally includes mounting and interconnecting electronic component parts onto a printed circuit. The required soldering may be done manually or automatically.

The final assembly is usually performed by a team or teams of technicians, with each worker performing a specified task or tasks. It entails assembling, securing, and interconnecting all subassemblies and component parts into one coherent system. Soldering in the final assembly is generally done manually. Accuracy tests and inspections are conducted during and after the assembly of the system.

U.S. tariff treatment

LLSIs are provided for in subheading 9027.30.40 of the HTS, a provision that includes electrical spectrometers, spectrophotometers, and spectrographs using optical radiations.[28] Parts and accessories of LLSIs are classified under HTS subheading 9027.90.40, covering parts and accessories of electrical instruments and apparatus. The column 1-general duty rate (the most-favored-

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[26] Based on interviews by USITC staff with industry officials during Apr. 2-6, 1990; and on testimony at USITC conference on Apr. 11, 1990.

[27] Based on USITC interviews with industry officials during Apr. 2-6, 1990, and on testimony at USITC conference on Apr. 11, 1990. In Wyatt's post-conference brief (pp. 22-23), the firm states that * * * .

[28] LLSIs were formerly provided for in item 712.49 of the Tariff Schedules of the United States, now repealed.

nation rate of duty, applicable to imports from Japan and most other countries) for these subheadings is 4.9 percent ad valorem.[29]

The Nature and Extent of Alleged Sales at LTFV

In order to obtain the estimated dumping margin for multi-angle LLSIs imported from Japan, the petitioner compared the U.S. price (USP) of such instruments with their foreign market value (FMV). The USP was based on a 1989 price for sale to end users issued by an unrelated U.S. distributer, adjusted to account for the distributor's mark-up. The FMV was based on a 1989 home market price list by Otsuka Electronics Co. Ltd., the Japanese producer/exporter. The price list reflects prices for sales directly from the manufacturer to end users in the home market. This methodology resulted in estimated dumping margins of 84 to 267 percent, depending on the USP adjustment to account for the distributor's mark-up.

The U.S. Market

U.S. producers

The domestic industry producing LLSIs is made up largely of small business concerns and may be characterized as highly fragmented. The businesses are highly technical, many having founders or principals who are Ph.D. physicists and who have worked in the light-scattering field for many years. Educating the U.S. market as to the possible uses of LLSIs, training customers how to use the instruments, and providing continued technical advice once an instrument has been purchased are major challenges the industry is faced with.

The petitioner, Wyatt Technology Corp., located in Santa Barbara, CA, was founded in 1982 by Dr. Philip J. Wyatt upon the award of a Defense Small Business Advance Technology contract by the U.S. Army Bioengineering Medical Research and Development Laboratory to establish the feasibility of a light-scattering instrument for the detection of toxicants in drinking water. A pioneer in the field, Dr. Wyatt invented the first commercial LLSI in the late 1960s. Wyatt also won a Small Business Innovation Research grant from the U.S. Army Armament Munitions and Chemical Command to develop and commercialize state-of-the-art light-scattering instrumentation and won a development contract from the Office of Naval Research. In 1988, Wyatt Technology did approximately *** percent of its business with the U.S. Government and *** percent with the commercial sector. At its single plant, the firm produces two multi-angle LLSIs capable of classical measurement, the Dawn Model F and the Dawn Model B, and an interferometric refractometer.

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[29] In addition, pursuant to the Omnibus Budget Reconciliation Act of 1986, a user fee is charged on most U.S. imports to cover the cost of the U.S. Customs Service's processing of imports. The user fee is currently 0.17 percent ad valorem.

Brookhaven Instruments Corp., located in Holtsville, NY, was founded in the mid 1970s by Dr. Walter Tscharnuter and Dr. Bruce Weiner. Brookhaven manufactures a series of instruments such as particle sizers, correlators, and goniometers for laser light-scattering. Its BI-200SM goniometer system (which * * *, in combination with either the BI-2030AT or BI-8000AT, is capable of classical measurement. In 1987, Brookhaven * * *. * * *. Brookhaven is in support of the petition.

Langley Ford Instruments, a division of Coulter Electronics, Inc., Hialeah, FL, is located in Amherst, MA. Coulter, the largest LLSI manufacturer in the United States, produces particle size analyzers that are capable of dynamic laser light-scattering only. Therefore, Coulter's product is considered to be outside the scope of this investigation. Coulter is in * * *.

LDC Analytical, Inc., located in Riviera Beach, FL, was a division of Milton Roy Co. prior to April 1989, when it was purchased, * * *, by Thermo Instrument Systems, Inc., Waltham, MA. In addition to a light-scattering detector and laser differential refractometer, LDC produces a low-angle LLSI capable of classical measurement, the KMX-6.

Leeds and Northrop, a unit of General Signal, introduced in March 1990 an instrument with classical measurement capabilities, the Series 9200. Located in St. Petersburg, FL, Leeds and Northrop's single plant employs over *** people.

C.N. Wood Mfg. Co., Inc., Newton, PA, the oldest U.S. producer of multi-angle light-scattering instruments, produces a low-tech instrument. The Wood product is a basic instrument that utilizes a white light. The instrument is adaptable to a laser, but the firm does not sell lasers or software with its product. Wood's instrument is considered to be outside the scope of this investigation.

U.S. importers

Polymer Laboratories, Inc., Amherst, MA, is the only importer from Japan of LLSIs with classical measurement capabilities. Polymer is the U.S. subsidiary of Polymer Laboratories, Ltd., located in the United Kingdom. The Japanese product is produced by the Photal Division of Otsuka Electronics Co. Ltd., Osaka, Japan. Before Polymer began marketing the instruments in 1989, Munhall Company imported Otsuka's DLS-700 instruments from 1986 to 1988.

Malvern Instruments, located in Southborough, MA, imports LLSIs from the United Kingdom. In addition to a particle sizer, Malvern imports the 4700PS system, which is capable of classical measurement.

According to industry sources, there is a German producer preparing to enter the U.S. market with a laser light-scattering instrument. The German company * * * produces a multi-angle instrument with a goniometer system.

Channels of distribution

Imported and domestic LLSIs are marketed and shipped directly to end users. A major means of marketing such instruments in the United States is through trade shows. There are approximately six trade shows held a year that are attended by most producers and importers. Other means of marketing LLSIs include the following: advertising in trade magazines and journals; holding workshops where technical papers are presented (often held at the same time as trade shows); and word of mouth (extremely important in the close-knit community of users). Due to the complex nature of LLSIs and the training needed to use the products, repeat sales to such customers as * * *, are not uncommon in the industry and are, in fact, an important market. Additional information on marketing methods are presented in the pricing section of this report.

Apparent U.S. consumption

Data on apparent U.S. consumption of LLSIs with classical measurement capabilities (whether or not also capable of dynamic measurements), and parts thereof, were compiled from information submitted in response to questionnaires sent by the Commission. These data, presented in table 1, are comprised of U.S.-produced domestic shipments, U.S. intracompany consumption, and U.S. shipments of imports.

Apparent U.S. consumption of such LLSIs * * * by *** percent between 1987 and 1989. The value of apparent U.S. consumption * * * by *** percent overall from 1987 to 1989. The value of apparent U.S. consumption of parts of such LLSIs (i.e., parts not included in complete instruments) * * * overall by *** percent between 1987 and 1989. Parts of LLSIs accounted for *** to *** percent of the annual value of total U.S. consumption of such instruments and parts thereof from 1987 to 1989. Throughout 1987 to 1989, imports accounted for *** to *** percent of apparent annual U.S. consumption.

Consideration of Alleged Material Injury to an Industry in the United States[30]

The information in this section of the report is based on data received from three U.S. producers of laser light-scattering instruments (and parts thereof) with classical measurement capabilities, whether or not such instruments are also capable of dynamic measurements. The three firms represent an estimated 99 percent of total U.S. production of such merchandise during the period covered by the investigation.

[30] Percentage changes in industry data for the period covered by the investigation are presented in appendix D.

Table 1
Laser light-scattering instruments and parts thereof: U.S.-produced domestic shipments, U.S. intracompany consumption, U.S. shipments of imports, and apparent U.S. consumption, 1987-89

Item	1987	1988	1989
	Quantity (units)		
Laser light-scattering instruments:			
U.S.-produced domestic shipments:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven[1]	***	***	***
Total	***	***	***
U.S. intracompany consumption:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven	***	***	***
Total	***	***	***
U.S. shipments of imports:			
Malvern[2]	***	***	***
Otsuka	***	***	***
Total	***	***	***
Apparent U.S. consumption	***	***	***
	Value (1,000 dollars)		
U.S.-produced domestic shipments:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven[1]	***	***	***
Total	***	***	***
U.S. intracompany consumption:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven	***	***	***
Total	***	***	***
U.S. shipments of imports:			
Malvern[2]	***	***	***
Otsuka	***	***	***
Total	***	***	***
Apparent U.S. consumption	***	***	***
Parts of laser light-scattering instruments:			
U.S.-produced domestic shipments			
LDC	***	***	***
Brookhaven[1]	***	***	***
U.S. shipments of imports	***	***	***
Apparent U.S. consumption	***	***	***

[1] * * * .

[2] Malvern is an importer of British instruments.

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

U.S. producers' capacity, production, and capacity utilization

Data for production, capacity, and capacity utilization for the firms producing LLSIs with classical measurement capabilities are summarized in table 2. Capacity to produce such instruments * * * by *** percent from 1987 to 1989. It should be noted that measurement of capacity may not be precise for those producers in the industry who also produce dynamic LLSIs, which are not covered by the scope of this investigation unless they are also capable of classical measurements.

Production of LLSIs * * * by *** percent from 1987 to 1989. Capacity utilization * * * by *** percent from 1987 to 1989. The * * * in capacity utilization can, in part, be attributed to the newly-emerging and ever improving technological nature of LLSIs and the learning curve of the producers. As the producers' skill improves with each product, the production time for each instrument decreases, thus increasing their capacity. One producer has been able to cut its lead time from * * * due to such improvements.

U.S. producers' shipments

The majority of shipments made by U.S. producers of LLSIs closely paralleled actual production. The U.S. producers' company transfers, domestic shipments, and export shipments of such instruments and parts thereof are presented in table 3.

Company transfers.--Company transfers of LLSIs were *** in 1987 and *** in 1989. These * * * were reported by * * *, which used them for demonstration and application testing purposes.

Domestic shipments.--U.S. producers' domestic shipments of LLSIs * * * overall by *** percent from 1987 to 1989. The value of U.S. shipments of such instruments * * * overall by *** percent from 1987 to 1989. The value of shipments of U.S. producers' parts of LLSIs * * * by *** percent from 1987 to 1989.

Export shipments.--U.S. producers' export shipments of LLSIs * * * by *** percent from 1987 to 1989. The value of these exports * * * by *** percent for the same period. Included in these numbers are company transfers abroad made by * * *. The industry has exported to * * *. The value of parts of LLSIs exported increased by *** percent during the period of investigation.

Total shipments.--Total U.S. producers' shipments of domestically produced LLSIs * * * in quantity by *** percent between 1987 and 1989. The estimated value of total shipments * * * by *** percent during the same period.

Table 2
Laser light-scattering instruments: U.S. capacity, production, and capacity utilization, by firms, 1987-89

Item	1987	1988	1989
Capacity (units):			
LDC[1]	***	***	***
Wyatt[1]	***	***	***
Brookhaven[2] [3]	***	***	***
Total	***	***	***
Production (units):			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven[2]	***	***	***
Total	***	***	***
Capacity utilization (percent):			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven[2]	***	***	***
Average	***	***	***

[1] Based on operating *** hours per week, *** weeks per year.
[2] Estimated.
[3] Based on operating *** hours per week, *** weeks per year.

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

U.S. producers' inventories

Yearend inventories of completed LLSIs were reported * * * (table 4). * * * inventories * * * from * * * instrument at yearend 1987 and 1988 to * * * instruments at yearend 1989. It should be noted that inventories are not ordinarily maintained. Most instruments are made to order and are shipped shortly after completion. The rapid change of technology in this industry discourages the maintenance of inventories because producers do not want to run the risk of being left with outdated instruments.

U.S. employment, wages, and productivity

Data on employment and productivity for the U.S. producers of LLSIs are shown in table 5. The number of workers and hours worked producing such instruments each * * * from 1987 to 1989 by *** percent. Total compensation and average hourly wages * * * by *** percent and *** percent, respectively, from 1987 to 1989. Unit labor costs * * * by *** percent from 1987 to 1989. The average number of production and related worker manhours required to produce a LLSI * * * irregularly from 1987 to 1989, by almost *** percent.

Table 3
Laser light-scattering instruments and parts thereof: U.S. producers' company transfers, domestic shipments, export shipments, and total shipments, 1987-89

Item	1987	1988	1989
	Quantity (units)		
Laser light-scattering instruments:			
U.S. producers' company transfers:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven	***	***	***
Total	***	***	***
U.S. producers' domestic shipments:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven[1]	***	***	***
Total	***	***	***
U.S. producers' export shipments:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven[1]	***	***	***
Total	***	***	***
U.S. producers' total shipments	***	***	***
	Value (1,000 dollars)		
U.S. producers' company transfers:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven	***	***	***
Total	***	***	***
U.S. producers' domestic shipments:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven[1]	***	***	***
Total	***	***	***
U.S. producers' export shipments:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven[1]	***	***	***
Total	***	***	***
U.S. producers' total shipments	***	***	***
Parts of laser light-scattering instruments:			
U.S. producers' domestic shipments	***	***	***
U.S. producers' export shipments	***	***	***
Total shipments	***	***	***
	Unit value (1,000 dollars)		
Laser light-scattering instruments:			
U.S. producers' domestic shipments:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven[1]	***	***	***
Average	***	***	***
U.S. producers' export shipments:			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven[1]	***	***	***
Average	***	***	***

[1] * * * .
[2] Not available.

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

Table 4
Laser light-scattering instruments: U.S. producers' end-of-period inventories, inventories as a share of U.S. shipments, and inventories as a share of total shipments, as of December 31 of 1987-89[1]

Item	December 31 of--		
	1987	1988	1989
Inventories (units):			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven	***	***	***
Total	***	***	***
Inventories as a share of U.S. shipments (percent):			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven	***	***	***
Average	***	***	***
Inventories as a share of total shipments (percent):			
LDC	***	***	***
Wyatt	***	***	***
Brookhaven	***	***	***
Average	***	***	***

[1] Parts of laser light-scattering instruments are not included in inventory data.

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

Financial experience of U.S. producers

Two companies provided income-and-loss data on their overall establishment operations in which LLSIs are produced. A summary of the two producers' sales data for 1989 is shown below (in thousands of dollars):

Company	Classical LLSIs		Overall establishment
	Multi-angle	Low-angle	

* * * * * * *

The combined establishment income-and-loss experience of the two producers is shown in table 6.

Table 5
Average number of production and related workers producing laser light-scattering instruments and parts thereof and all products, hours worked, wages paid, hourly wages, total compensation paid, productivity, and unit labor costs, 1987-89

Item	1987	1988	1989
Number of production and related workers producing--			
All products	***	***	***
Laser light-scattering instruments and parts thereof	***	***	***
Hours worked by production and related workers producing--			
All products (1,000 hours)	***	***	***
Laser light-scattering instruments and parts thereof (1,000 hours)	***	***	***
Wages paid to production and related workers producing--			
All products (1,000 dollars)	***	***	***
Laser light-scattering instruments and parts thereof (1,000 dollars)	***	***	***
Average hourly wages paid to production and related workers producing--			
All products	***	***	***
Laser light-scattering instruments and parts thereof	***	***	***
Total compensation paid to production and related workers producing--			
All products (1,000 dollars)	***	***	***
Laser light-scattering instruments and parts thereof (1,000 dollars)	***	***	***
Unit labor costs (laser light-scattering instruments)	***	***	***
Average number of manhours worked by production and related workers in producing 1 instrument	***	***	***

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

Table 6
Income-and-loss experience of U.S. producers on the overall operations of their establishments within which laser light-scattering instruments are produced, accounting years 1987-89

Item	1987	1988	1989
	Value (1,000 dollars)		
Net sales	***	***	***
Cost of goods sold	***	***	***
Gross profit	***	***	***
Selling, general and administrative expenses	***	***	***
Operating income or (loss)	***	***	***
Interest expense	***	***	***
Other income or (expense), net	***	***	***
Net income or (loss) before income taxes	***	***	***
Depreciation and amortization included above	***	***	***
Cash flow[1]	***	***	***
	Share of net sales (percent)		
Cost of goods sold	***	***	***
Gross profit	***	***	***
Selling, general and administrative expenses	***	***	***
Operating income or (loss)	***	***	***
Net income or (loss) before income taxes	***	***	***
	Number of firms reporting		
Operating losses	***	***	***
Net losses	***	***	***
Data	2	2	2

[1] 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.

Wyatt's overall establishment operations.--The income-and-loss experience of Wyatt Technology is presented in table 7.[31]

* * * * * * *

Table 7
Income-and-loss experience of Wyatt Technology on its overall establishment operations, accounting years ended December 31, 1987, 1988, and 1989

Item	1987	1988	1989
* * * * * * *			

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

Shown below is a tabulation of the number of instruments sold[1] commercially since inception:

Year	Domestic	Foreign	Total
1982	***	***	***
1983	***	***	***
1984	***	***	***
1985	***	***	***
1986	***	***	***
1987	***	***	***
1988	***	***	***
1989	***	***	***

[1] * * *.

In its petition, the company stated that it has a * * *.[32] The company indicated that * * *.

[31] * * *.

[32] Petition, pp. 18-26.

Wyatt's analysis of * * *.[33]

Investment in productive facilities.--Wyatt's property, plant and equipment data and its return on assets are shown in table 8.

Capital expenditures.--Wyatt furnished data on its capital expenditures for its overall establishment operations. * * *.

Research and development expenses.--Wyatt Technology * * *. Research and development efforts include * * *.[34]

Capital and investment.--The Commission requested U.S. producers to describe any actual or potential negative effects of imports of multi-angle LLSIs from Japan on their firm's growth, investment, ability to raise capital, and the scale of capital investments. Their responses are shown in appendix E.

Table 8
Value of property, plant, and equipment of Wyatt Technology, as of December 31 of 1987, 1988, and 1989

Item	As of December 31--		
	1987	1988	1989
*	*	*	*	*	*	*

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

Consideration of the Question of 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--

[33] Wyatt's petition is * * *.

[34] Telephone conversation with * * *.

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[35]--

> (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 701 or 731 or to final orders under section 736, are also used to produce the merchandise under investigation,

---

[35] 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."

> (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 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.[36]

No subsidies were alleged in this investigation; 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 imports of the subject merchandise 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 in the section entitled "Consideration of alleged material injury to an industry in the United States." Available information on U.S. inventories of the subject products (item (V)); foreign producers' operations, including the potential for "product-shifting" (items (II), (VI), and (VIII) above); any other threat indicators, if applicable (item (VII) above); and any dumping in third-country markets, follows.

U.S. inventories of laser light-scattering instruments from Japan

Polymer Laboratories, the only importer of the LLSIs from Japan covered by this investigation, * * * in the United States. However, Polymer claims that * * *. For further information on * * * see the "lost sales and lost revenues" section of this report.[37]

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[36] Section 771(7)(F)(iii) of the act (19 U.S.C. § 1677(7)(F)(iii)) further provides that, in antidumping investigations, ". . . the Commission shall consider whether dumping in the markets of foreign countries (as evidenced by dumping findings or antidumping remedies in other GATT member markets against the same class or kind of merchandise manufactured or exported by the same party as under investigation) suggests a threat of material injury to the domestic industry."

[37] In its questionnaire response, Polymer Laboratories, Inc., reported that in 1989 * * *.

Ability of Japanese producer to generate exports and the availability of export markets other than the United States

The Commission requested counsel for the respondent in the subject investigation, Otsuka Electronics Co., Ltd., to provide information on its client's LLSI operations.[38] Otsuka Electronics Japan was established in 1970; it has about 142 employees and specializes in the field of research electronics. Otsuka Electronics USA employs 28 people in the United States, and has an office and factory in Haverton, PA.[39] Otsuka reported the following in its questionnaire response:

* * * * * * *

As shown in table 9, the combined capacity reported for the production of the three instruments produced in Otsuka's facility was *** in 1987 and 1988, *** in 1989,[40] and is projected to be *** in 1990. The projected * * * in capacity in 1990 is attributed to * * *. The firm reported that "Exports to the United States of DLS-700, the only one of the three instruments covered by the Petition, were as follows: *** in 1987, *** in 1988, *** in 1989, and *** projected for 1990. (Otsuka reports that its exports of DLS-700 models to the United States, including those prior to the period of investigation, amount to four instruments.)[41]

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[38] The petition in this investigation states that the respondent's parent firm, Otsuka Pharmaceutical Co., Ltd., had 1985 sales of about $1.3 billion.

[39] Transcript of the conference, p. 103.

[40] Otsuka attributed the * * *.

[41] Three of these instruments have been sold and the fourth is currently being leased. The first DLS-700 was purchased by Dr. Toshio Asakura, a professor at the University of Pennsylvania and the director of the Hemoglobin Laboratory at the Children's Hospital of Philadelphia. Dr. Asakura states that he purchased an Otsuka instrument in 1986 and adds that "Since my DLS was the first to be sold in the United States, I got a discount from Otsuka in exchange for the understanding that I would allow them to use it as a demonstration model to show to potential customers." (Dr. Asakura's statement is included in respondent's collective exhibit 1 submitted during the Commission's conference on Apr. 11, 1990). Dr. Karasz, also the owner of one of the DLS-700 models in the United States, stated at the conference that he purchased it around 1987; this instrument, purchased from Munhall, was also apparently a demonstration model (transcript. p. 157).

Table 9
Laser light-scattering instruments and parts thereof: Otsuka Electronics Co., Ltd.'s, capacity, production, capacity utilization, end-of-period inventories, shipments, and exports, 1987-89 and projected 1990[1]

Item	1987	1988	1989	Projected 1990
LLSIs:				
Capacity (units)[2]	***	***	***	***
Production (units)	***	***	***	***
Capacity utilization (percent)	***	***	***	***
End-of-period inventories (units)	***	***	***	***
Shipments:				
Exports to the U.S. (units)	***	***	***	***
Other exports (units)	***	***	***	***
Total exports (units)	***	***	***	***
Home market (units)	***	***	***	***
Total shipments (units)	***	***	***	***
Parts for LLSIs:				
Shipments:				
Exports to the U.S. (1,000 yen)	***	***	***	***[3]
Other exports (1,000 yen)	***	***	***	***[3]
Total exports (1,000 yen)	***	***	***	***[3]
Home market (1,000 yen)	***	***	***	([4])
Total shipments (1,000 yen)	***	***	***	([4])

[1] * * *.
[2] * * *.
[3] * * *.
[4] Not available.

Source: Data submitted by counsel for Otsuka Electronics Co, Ltd., in response to a request for information by the Commission

Discussion of the future U.S. market for laser light-scattering instruments

In the course of this investigative proceeding, respondent has identified a factor which it maintains will lead to future changes in the U.S. market and, more specifically, to changes in Otsuka's role in that market. In November 1989, Otsuka hired Dr. John MacKay in the United States to develop and implement plans for U.S. production. By the middle of 1991, Otsuka expects that *all DLS-700 instruments* sold in the United States will be produced in the United States.[42] Otsuka (USA) had already leased a *** square

[42] Testimony of Kenji Nakayama, President of Otsuka Electronics Japan and President and chief executive office of Otsuka Electronics USA, and Dr. John MacKay, director of international business for Otsuka Electronics, during the Commission's conference on Apr. 11, 1990. It is not clear, however, if this means all Otsuka LLSIs with classical measurement capabilities will be

(continued...)

foot space in a building in Havertown, PA, from * * *, for a planned production facility. It has a * * * lease beginning * * *, and ending * * *. Only *** square feet of this is to be used for production of the DLS-700. The rest is for the production of * * *. In 1989 only * * * working on preparation of production of the DLS-700. Plans call for *** additional employees to be hired in 1990, with a possible *** in 1991.[43]

During the conference, witnesses for Otsuka testified that the firm planned to source most components and parts in the United States, but would import from Japan the optical benches for its DLS-700 models. Mr. Nakayama stated that the optical bench would amount to about 20 to 25 percent of the value of the total cost of the DLS-700 instrument.[44]

Consideration of the Causal Relationship Between Imports of the Subject Merchandise and the Alleged Material Injury

U.S. imports of laser light-scattering instruments

Imports of LLSIs are presented in table 10. As described earlier in the report, imports of such instruments from Japan have been few. * * * imported in 1988 and *** in 1989.[45] The imports from Japan in 1989 were valued at ***. Malvern, an importer of British instruments, imported *** instruments in 1989 valued at ***.

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[42] (...continued)
produced in the United States; the firm did not state that future generations or models of its current multi-angle LLSI will be produced in the United States. Moreover, the firm did not supply an estimate or projection of its U.S. production of LLSIs.

[43] Otsuka's postconference brief states (pp. 22 and 24) that * * *.

[44] As indicated previously, the petitioner states that * * * .

[45] This includes one instrument currently being leased by Dow Chemical.

Table 10
Laser light-scattering instruments: U.S. imports for consumption, 1987-89

Item	1987	1988	1989
	Quantity (units)		
LLSIs from--			
Japan	***	***	***
All other sources[1]	***	***	***
Total	***	***	***
	Value (1,000 dollars)		
LLSIs from-			
Japan	***	***	***
All other sources	***	***	***
Total	***	***	***
	Unit value (1,000 dollars)		
LLSIs from-			
Japan	***	***	***
All other sources	***	***	***
Average	***	***	***

[1] Malvern imports LLSIs from the United Kingdom.

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

U.S. market penetration by imports

Data on penetration of imports of LLSIs from Japan into the U.S. market are presented in table 11. Market penetration of imports from Japan was an estimated *** percent in 1988 and *** percent in 1989. It is important to note that LLSIs are not commodity products. The market is characterized by infrequent sales preceded by long lead times.

Table 11
Laser light-scattering instruments: Share of U.S. consumption supplied by Japan and all other countries, 1987-89

Item	1987	1988	1989
Based on quantity:[1]			
Apparent U.S. consumption (units).....	***	***	***
Share of apparent U.S. consumption supplied by --			
Japan (percent).....	***	***	***
All other sources (percent).....	***	***	***
Total imports (percent).....	***	***	***
Based on value:			
Apparent U.S. consumption (1,000 dollars).....	***	***	***
Share of apparent U.S. consumption supplied by --			
Japan (percent).....	***	***	***
All other sources (percent).....	***	***	***
Total imports (percent).....	***	***	***

[1] Not including parts.
[2] Not available.

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

Market characteristics and prices

LLSIs are high-technology devices used for the study of macromolecular particles, for quality control testing, and the development of new products whose physical characteristics are determined by macromolecular particles. The primary users are commercial and university chemistry and physics research laboratories, and industrial facilities that need to test the macromolecular characteristics of their products. The demand for LLSIs depends upon the research, quality control testing, and new product development needs of users. Industries which use these instruments are the chemical, petrochemical, pharmaceutical, and biotechnological industries.

Potential substitutes are similar instruments that use radiation,[46] i.e., instruments that use part of the electromagnetic spectrum. However, few

[46] All radiation moves in waves and these waves have the same speed in free space. They differ in wavelength only, which means that the sources that give rise to them and the instruments used to make measurements with them are rather different. Taken from Halliday and Resnick, Physics for Students of Science and Engineering, Part II, New York, John Wiley & Sons, Inc., 1961), p. 840.

practical substitutes exist because only radiation of visible waves, ultraviolet waves, and wavelengths in the lower spectrum of infrared waves, are usable.[47] Wavelengths must be shorter than the density of the macromolecule in order to measure molecular size.[48] Longer wavelengths may be used to determine molecular size and weight, but practical problems occur because liquids absorb the waves. For example, microwaves are used to heat foods because they are absorbed by the food and create heat. Although wavelengths shorter than ultraviolet waves could also be used to determine molecular size and weight, they are not used because they are much more difficult and expensive to generate.

A single wavelength is used to measure molecular weight or particle size.[49] The advantage of using a laser light source rather than an incandescent light source is that laser light is monochromatic, i.e., it has only one wavelength, whereas incandescent light includes many different wavelengths.[50]

Marketing methods.--Firms producing LLSIs use a number of methods to market their products. All firms producing these instruments attend trade shows where they exhibit their wares and provide potential customers with an opportunity to compare the equipment of the competing firms.[51] There are several shows each year such as the American Chemical Society show and the International Biotechnology Exposition. Advertising in trade journals such as Analytic Chemistry, LCGC, American Laboratory, and Biotechnology is another marketing method. Some LLSI manufacturers also use sales agents to sell their machines, and direct mail is another means of marketing. Sales are also made by word-of-mouth. Many of the professionals in the field know one another and purchase the machine suggested by their associates.

In some cases an individual user's experience with a firm can develop repeat sales. If a firm's research laboratory uses a particular LLSI for product development, the production side of the firm is likely to use the same machine. Repeat sales are mostly purchases by such large companies. For example, * * *.[52]

---

[47] Other instruments are discussed in the "description and uses" section of this report.

[48] Conversation with * * *. This is the Rayleigh criterion, which states that the wavelength must be sufficiently short to measure the molecule.

[49] Different wavelengths will give different interim measurements which then have to be adjusted according to the wavelength used. A single wavelength is preferred because it is difficult to separate the results when using multiple wavelengths.

[50] In order to measure molecular weight or particle size with an incandescent light, the light must be filtered to get only one wavelength.

[51] * * *.

[52] * * *.

All of Wyatt's machines are sold * * *. * * *, and there is a 1-year warranty on parts and labor. Payment terms are * * *. Training at Wyatt's laboratory is included in the cost of each purchase. Lead time is from * * * days from date of order. Neither Brookhaven Instruments nor LDC Analytical, a producer of low-angle LLSIs, responded to the questions concerning product marketing or terms.

Polymer Laboratories offers a 1 year warranty on parts and software, and has payment terms of * * *. Sales are on a * * *.[53] Lead time is from * * * weeks from date of order and training costs are *** per day.

Price information.--The Commission requested price information on all sales during January 1989-February 1990 from U.S. producers and importers of LLSIs. Price lists were also requested from all participants. Three domestic producers and the sole importer of the Japanese instruments submitted price information.[54]

The price of an instrument varies with the features required. Many of these instruments are built to order, and prices vary widely because of the different options that can be purchased. For example, in 1989-90 Wyatt sold its Dawn Model F LLSI for as much as *** and as little as ***. Its average sale price for the Dawn model F LLSI during this period was ***. Table 12 and figure 3 list all of Wyatt's sales for January 1989-February 1990.

Trends in prices cannot be developed because of the different options included with the instruments. However, the list price for the basic device increased from $28,500 in April to $31,350 in May 1989, and then increased to $35,000 in March 1990. The prices of all software and options remained the same throughout the period. * * *.

Wyatt listed *** sales to purchasers in the United States from April 1989 through February 1990. No sales were reported from January through March 1989. *** of the *** were for the Dawn F model. Most of Wyatt's LLSIs were equipped with * * *. *** were equipped with the * * * and *** with the * * *. * * * were sold but one LLSI was equipped with the * * *.

---

[53] * * *.

[54] * * *.

Table 12
Laser light-scattering instruments: Wyatt Technology's sales, January 1989-February 1990

Purchaser	Purchase date	Instrument: Model F	Instrument: Model B	Software: Astra	Software: Easi	Software: Aurora	Options: Data board	Options: Amplifier board	Options: Argon	Options: High temperature	Options: Peltier heat/cool	Options: Autocorr. interface	Options: Flow cell kit	Options: Cylinder flow cell	Total
					*	*	*	*	*	*	*				

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

Figure 3
Laser light-scattering instruments: Prices of Wyatt Technology's sales, 1989 and 1990

* * * * * * *

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

LDC Analytical, a domestic producer of low-angle LLSIs, sells two models, the KMX-6 and the CMX-100. During January 1989-February 1990, LDC sold *** KMX-6 units for *** apiece. They made * * * sales of the CMX-100, which sell for *** per unit.

Polymer Laboratories, the importer of the Otsuka LLSI, reported selling one machine to the University of Oklahoma during 1989. It has also recently leased a machine to * * *.

Price comparisons of instruments, software, and options.--Because there was only one foreign sale the usual price comparisons could not be made.[55] List prices for two producers and the importer are presented below. They are organized according to the features offered by Otsuka. Wyatt offers several options that are not offered by Otsuka or Brookhaven. For example, Wyatt offers for its Dawn F a cylinder flow cell and a flow cell kit and manifolds, each for $3,500. Purchasers report that the flow cell is especially useful in research and quality control applications.

LLSIs, whether constructed with a fixed array of detectors or with a goniometer, come with a variety of software and options. Each company determines which equipment and software to include in the base price and which to sell separately. List prices of comparably equipped Wyatt, Brookhaven, and Otsuka LLSIs are provided in table 13. * * *, list prices may reflect competition in the market place. However, * * *.

Wyatt sells two fixed-array LLSI models with the light detectors spread around the sample cell, the Dawn F and the Dawn B. The 1990 base price of Wyatt's more sophisticated LLSI, the Dawn F, is $35,000 and the price of its

[55] Details of this transaction are discussed in the lost sales section.

Dawn B is $27,800.[56] Wyatt includes its "Dawn" software, which computes the root mean square radius and the second virial coefficient and works interactively with other software that has been developed in-house. The typical price for a Brookhaven LLSI, which includes a data card and an autocorrelator interface, is currently $26,830.[57] The list price of Otsuka's DLS-700 is $42,000, and includes software to measure molecular weight, a data collection card, and an autocorrelator. Both the Brookhaven and Otsuka use a goniometer equipped with a single detector. Wyatt uses a fixed array system.

"Zimm Plot" software is used to measure molecular weights. Zimm Plot is an algorithm used to extrapolate to zero angle and zero concentration of the molecule being studied from the data gathered from the different angles. The molecular weight is then calculated from the zero angle. Wyatt provides Zimm Plot capabilities with its "Aurora" software for $2,000. Brookhaven provides Zimm Plot software for $1,250 and Otsuka includes its software in its base price.

The "Debye Plot" and "Berry Plot" software also measures molecular weight but provides more information than the Zimm Plot. Wyatt provides these capabilities with its "Astra" software for $4,500.[58] Otsuka includes these in its base price, while Brookhaven does not provide them.[59]

Wyatt requires a data translation board to run all data collection software. It charges $1,500 for this board. The Brookhaven and Otsuka DLS-700 include this board.

Temperature control options, necessary for particle sizing and for use with a refractometer, are offered by all suppliers. Temperature control is important because the light-scattering properties of the molecules are temperature dependent. Wyatt sells two internal temperature control options, the Peltier heater/cooler option for $10,500 that is used to keep the sample

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[56] In addition to the standard method of examining the macromolecule in a vial, the Dawn F has a flow cell that allows for on-line, near real-time determinations of molecular weights and sizes of both known and unknown samples. This flow cell allows for chromatography capabilities. Chromatography is a method of separating an unknown sample into different molecules and identifying the molecules by the separation of wavelengths emitted.

[57] The Brookhaven price list is set up differently than Wyatt's and Otsuka's. Its price list has many different configurations. The light scattering instrument and the autocorrelator listed are considered typical purchases by Brookhaven.

[58] The "Astra" software is only available for the Dawn F.

[59] In an Apr 12, 1990 letter to the Commission, Dr. Walther Tscharnuter, president of Brookhaven Instruments, stated that since 1988 Brookhaven has supplied both the Debye and Berry plots. However, Brookhaven's list prices do not include either of these items.

Table 13
Laser light-scattering instruments: 1990 list prices for Wyatt Technology, Brookhaven, and Otsuka, organized according to options offered by Otsuka

Item	Wyatt Technology Dawn F	Wyatt Technology Dawn B	Brookhaven [1]	Otsuka DLS-700
Light-scattering instrument	$35,000	$27,800	$26,830	$42,000
Amplifier board	1,700[2]	1,700[2]	na	na
Zimm Plot software	2,000	2,000	1,250	included
Debye Plot software	4,500	na	([3])	included
Berry Plot software	([4])	na	([3])	included
Data collection	1,500	1,500	included	included
Temperature control	10,500	10,500	2,500[5]	5,280[5]
Autocorrelator interface	6,500	6,500	included	5,000
Autocorrelator	12,500	12,500	18,625	included
AT type computer and printer	3,000	3,000	3,725	4,995
Refractometer	16,500	16,500	na	18,000
Argon-ion laser option	12,600	12,600	15,900	15,500
Total with listed options	106,300	94,600	68,830	90,775
Domestic equivalent to Otsuka basic	57,200	45,500[6]	46,705[6]	42,000

[1] The Brookhaven price list is set up differently than Wyatt's and Otsuka's. Its price list has many different configurations. The light-scattering instrument and the autocorrelator listed are considered typical purchases by Brookhaven.

[2] Because Wyatt uses photodiode sensors, an amplifier board is necessary to measure particle size, and aids in measuring molecular weight. * * *.

[3] In an April 12, 1990, letter to the Commission, Dr Walther Tscharnuter, president o Brookhaven Instruments, stated that since 1988 Brookhaven has supplied both the Debye an Berry plots. However, Brookhaven's list prices do not include either of these items.

[4] The Berry Plot and Debye Plot are include in the Wyatt's "Astra" software.

[5] External temperature control bath.

[6] Does not include the Debye Plot or the Berry Plot software.

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

below or at ambient temperatures, and a high-temperature option for $9,750 for its Dawn F LLSI and $8,500 for its Dawn B LLSI that is used for thermodynamics. Both Brookhaven and Otsuka offer an external temperature control bath that functions similar to the internal Peltier heater/cooler. Brookhaven provides the bath for $2,500, while Otsuka charges $5,280.

In order to measure particle size, an autocorrelator and an autocorrelator interface must be added to the basic LLSI. Wyatt provides a Nicomp Autocorrelator for $12,500 and the autocorrelator interface for $6,500. Brookhaven charges $18,625 for an autocorrelator, including the autocorrelator interface. Otsuka includes the autocorrelator in the basic machine, but charges $5,000 for the autocorrelator interface.

Wyatt, Brookhaven, and Otsuka all provide IBM AT type computers and printers to their customers. Wyatt charges $3,000, Brookhaven charges $3,725, and Otsuka charges $4,995 for this option.

A refractometer is available from both Wyatt and Otsuka, but not from Brookhaven. Refractometers are used for determining the refractive index increment, a measure of the relationship between a polymer's response in a solvent and the type of solvent.[60] Since the refractive indexes of all known polymers relative to the most popular solvents are widely available in books, few refractometers are sold. Companies creating new polymers or companies that use unusual solvents would need a refractometer. Wyatt sells the refractometer for $16,500, while Otsuka sells it for $18,000. Brookhaven does not offer a refractometer.

An argon-ion laser light option is also available. If the polymer being tested is overly opaque for the standard helium-neon (HeNe) laser an argon-ion laser is useful. Because the configuration of the LLSI is different for the Argon-ion laser, this laser is purchased in place of the standard HeNe laser. Wyatt offers an argon-ion laser for $12,600. Brookhaven offers three different argon-ion lasers for $15,900, $16,950 and $18,950, respectively. Otsuka offers two different argon-ion laser, one for $15,500 and the other for $34,500.

Lost sales and lost revenues

No lost sales or lost revenues were alleged in the questionnaire responses. However, one Japanese instrument was sold in 1989 and another was leased in * * *. In each case there was competition from a domestic instrument.

Polymer Laboratories sold one machine to Dr. Sachdev of the University of Oklahoma in 1989 for ***. Although Polymer Laboratories reports that it does not * * *, the sale price to Dr. Sachdev of the University of Oklahoma was ***, or *** * * * the list price of *** for Otsuka's basic LLSI (see table

[60] The refractive index increment is the percentage change of the refractive index relative to the concentration of the solvent.

13). Polymer Laboratories states that * * *, so that they can be used as a reference site, as in this case. In this case a * * *.[61]

Dr. Sachdev said that he had originally * * * LLSI for ***. When * * *, Dr. Sachdev called * * * and was told that * * *. When * * * personnel indicated that they did not know when they could deliver, Dr. Sachdev * * *. Dr. Sachdev then called a friend * * *, who owns an Otsuka DLS-700 and a * * * LLSI. * * *, who purchased his Otsuka in 1986, recommended the Otsuka and stated that the * * *. Dr. Sachdev said that * * * machines were never considered.[62]

Polymer Laboratories has also recently leased a machine * * *. Operating under a severe time constraint to * * * a LLSI, * * * tested Otsuka's DLS-700 and Wyatt's Dawn F LLSIs. * * * said that both machines are excellent and he wishes he could have both. He said that each machine has certain capabilities that are superior to the other and that both machines are well suited for research. * * * believes that for general research either machine could be used, but if very specialized research is performed, then the LLSI most suitable for that type of research should be used. * * * stated that his selection of the DLS-700 was made partially because it included more equipment in its basic package than the Dawn F and was therefore better able to perform some of his tests. He did not have time to obtain optional equipment from Wyatt.

His choice of the DLS-700 was based on two criteria. First, it was delivered with a florescence blocking filter while the Dawn F was not. Second, * * * stated that although a fixed array, multiple detector system, such as the Dawn F, is capable of depolarization, he was worried that the filters used on the detectors would not be completely uniform. Since the DLS-700 has only a single detector, it would not have the problem of uniformity between filters. * * * added that another advantage the DLS-700 has over the Dawn F is that the DLS-700 comes with the autocorrelator.

* * * pointed out that a number of the options available on the Dawn F made it a better machine for other types of research. He stated that the Dawn F had a vastly superior temperature control system that makes it better suited for thermodynamic research. He also stated that the Dawn F's internal bath system (the Peltier heater/cooler) was superior to the DLS-700's external bath because it provided a better regulation of ambient or cooler temperatures. The Dawn F flow cell was also viewed as very advantageous for most types of research.

Both Otsuka and Wyatt offered lease agreements with an option to buy. Otsuka charged ***. If purchased * * *. Wyatt listed in its lease agreement for its Dawn F, a charge of ***. There is * * *.

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[61] Polymer Laboratories said the list price for this LLSI was ***, which differs from the $42,000 listed in its sales brochure.

[62] Telephone conversation with Dr. Sachdev of the University of Oklahoma.

Exchange rates

Quarterly data reported by the International Monetary Fund indicate that during the period January 1987-December 1989 the nominal value of the Japanese yen fluctuated, appreciating by an overall 7.1 percent relative to the U.S. dollar (table 14).[63] Adjusted for movements in producer price indexes in the United States and Japan, the real value of the Japanese currency depreciated less than 2 percent overall in the period covered.

Table 14
Exchange rates:[1] Nominal and real exchange rates of the Japanese yen, and producer price indexes in the United States and Japan,[2] by quarters, January 1987-December 1989

Period	U.S. producer price index	Japanese producer price index	Nominal exchange-rate index	Real exchange-rate index[3]
1987:				
January-March.....	100.0	100.0	100.0	100.0
April-June.....	101.6	99.2	107.4	104.8
July-September.....	102.8	100.5	104.3	101.9
October-December....	103.2	100.1	112.8	109.5
1988:				
January-March.....	103.8	99.0	119.7	114.1
April-June.....	105.6	98.6	121.9	113.9
July-September.....	107.1	99.5	114.6	106.5
October-December....	107.6	98.7	122.3	112.2
1989:				
January-March.....	109.9	99.2	119.2	107.6
April-June.....	111.8	101.8	110.9	101.1
July-September.....	111.3	102.6	107.6	99.2
October-December....	111.8	102.4	107.1	98.1

[1] Exchange rates expressed in U.S. dollars per Japanese yen.

[2] Producer price indexes--intended to measure final product prices--are based on average quarterly indexes presented in line 63 of the International Financial Statistics.

[3] The real exchange rate is derived from the nominal rate adjusted for relative movements in producer prices in the United States and Japan. Producer prices in the United States increased 11.8 percent between January 1987 and December 1989 compared to a 2.4-percent increase in Japanese prices during the same period.

Note.--January-March 1987=100.

Source: International Monetary Fund, International Financial Statistics, April 1990.

[63] International Financial Statistics, April 1990.

APPENDIX A

COMMISSION'S FEDERAL REGISTER NOTICE

INTERNATIONAL TRADE COMMISSION

[Investigation No. 731-TA-455 (Preliminary)]

Multi-Angle Laser Light Scattering Instruments and Parts Thereof From Japan

AGENCY: United States International Trade Commission.

ACTION: Institution of a preliminary antidumping 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 antidumping investigation No. 731-TA-455 (Preliminary) under section 733(a) of the Tariff Act of 1930 (19 U.S.C. 1673b(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 Japan of multi-angle laser light scattering instruments, provided for in subheading 9027.30.40 of the Harmonized Tariff Schedule of the United States (previously reported under item 712.49 of the Tariff Schedules of the United States), and parts thereof, that are alleged to be sold in the United States at less than fair value. As provided in section 733(a), the Commission must complete preliminary antidumping investigations in 45 days, or in this case by May 3, 1990.

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), and part 201, subparts A through E (19 CFR part 201).

EFFECTIVE DATE: March 19, 1990.

FOR FURTHER INFORMATION CONTACT: Elizabeth Haines (202-252-1200), 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 202-252-1810. 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 March 19, 1990 by Wyatt Technology Corporation, Santa Barbara, CA.

Participation in the investigation. Persons wishing to participate in this investigation as parties must file an entry of appearance with the Secretary to the Commission, as provided in section 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 representatives, 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 certificate of service.

Limited disclosure of business proprietary information under a protective order and business proprietary information service list. Pursuant to § 207.7(a) of the Commission's rules (19 CFR 207.7(a)), 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 Director of Operations of the Commission has scheduled a conference in connection with this investigation for 9:30 a.m. on April 11, 1990 at the U.S. International Trade Commission Building, 500 E Street SW., Washington, DC. Parties wishing to participate in the conference should contact Elizabeth Haines (202-252-1200) not later than April 6, 1990 to arrange for their appearance. Parties in support of the imposition of antidumping 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 April 13, 1990 a written brief containing information and arguments pertinent to the subject matter of the investigation, 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).

Parties which obtain disclosure of business proprietary information pursuant to § 207.7(a) of the Commission's rules (19 CFR 207.7(a)) may comment on such information in their written brief, and may also file additional written comments on such information no later than April 17, 1990. 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: March 19, 1990.

Kenneth R. Mason,

Secretary.

[FR Doc. 90-6742 Filed 3-22-90; 8:45 am]

BILLING CODE 7020-02-M

APPENDIX B

COMMERCE'S FEDERAL REGISTER NOTICE

[A-588-813]

Initiation of Antidumping Duty Investigation: Certain Light Scattering Instruments and Parts Thereof From Japan

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 (the Department), we are initiating an antidumping duty investigation to determine whether imports of certain light scattering instruments and parts thereof (hereinafter referred to as LSIs) from Japan are being, or are likely to be, sold in the United States at less than fair value. We are notifying the U.S. International Trade Commission (ITC) of this action so that it may determine whether imports of LSIs from Japan are materially injuring, or threaten material injury to, a U.S. industry. If this investigation proceeds normally, the ITC will make its preliminary determination on or before May 3, 1990. If that determination is affirmative, we will make preliminary determination on or before August 27, 1990.

EFFECTIVE DATE: April 17, 1990.

FOR FURTHER INFORMATION CONTACT: Bradford L. Ward, Office of Antidumping Investigations, Import Administration, International Trade Administration, U.S. Department of Commerce, 14th Street and Constitution Avenue NW., Washington, DC 20230; telephone (202) 377-5288.

SUPPLEMENTARY INFORMATION:

The Petition

On March 19, 1990, we received a petition filed in proper form by Wyatt Technology Corporation. In compliance with the filing requirements of the Department's regulations (19 CFR 353.12 (1989)), petitioner alleges that imports of LSIs from Japan are being, or are likely to be, sold in the United States at less than fair value within the meaning of section 731 of the Tariff Act of 1930, as amended (the Act), and that these imports are materially injuring, or threaten material injury to, a U.S. industry.

Petitioner has stated that it has standing to file the petition because it is an interested party, as defined under section 771(9) (C) of the Act, and because 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 for, or opposition to, this petition, please file written notification with the Assistant Secretary for Import Administration.

Under the Department's regulations, any producer or reseller seeking exclusion from a potential antidumping duty order must submit its request for exclusion within 30 days of the date of the publication of this notice. The procedures and requirements regarding the filing of such requests are contained in 19 CFR 353.14.

United States Price and Foreign Market Value

Petitioner based United States Price (USP) for LSIs on a 1989 price for sale to end users issued by an unrelated U.S. distributor, adjusted to account for distributor's mark-up.

Petitioner bases foreign market value (FMV) for LSIs on a 1989 home market Otsuka price list. The price list reflects prices for sales directly from the manufacturer to end users in the home market.

We have accepted as the basis for the LTFV allegation petitioner's comparison of United States price with FMV. This methodology results in estimated dumping margins of 84 percent to 267 percent, depending on the USP adjustment to account for distributor's mark-up.

Initiation of Investigation

Under section 732(c) of the Act, the Department must determine, within 20 days after a petition is filed, whether the petition sets forth the allegations necessary for the initiation of an antidumping duty investigation, and whether the petition contains information reasonably available to the petitioner supporting the allegations.

We have examined the petition on LSIs from Japan and found that the petition meets the requirements of section 732(b) of the Act. Therefore, in accordance with section 732 of the Act, we are initiating an antidumping duty investigation to determine whether imports of LSIs from Japan are being, or are likely to be, sold in the United States at less than fair value. If our investigation proceeds normally, we will make our preliminary determination by August 27, 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

subheadings. The HTS subheadings are provided for convenience and U.S. Customs Service purposes. The written description remains dispositive as to the scope of the product coverage.

The products covered by this investigation are light scattering instruments and parts thereof from Japan that have classical measurement capabilities, whether or not also capable of dynamic measurements. Subject LSIs employ laser light and may use either the single-angle or multi-angle measurement technique. The following parts are included in the scope of the investigation when they are manufactured for use only in an LSI: Scanning photomultiplier assemblies, immersion baths, sample-containing structures, electronic signal-processing boards, molecular characterization software, preamplifier/discriminator circuitry, and optical benches. LSIs may be sold inclusive or exclusive of such accessories as personal computers, cathode ray tube displays, software or printers. LSIs are used primarily for characterization of macromolecules and submicrons in solution. LSIs are currently classifiable under HTS subheading 9027.30.40. LSI parts are currently classifiable under HTS subheading 9027.90.40.

ITC Notification

Section 732(d) of the Act requires us to notify the ITC of this action and to provide it with the information we used to arrive at this determination. We will notify the ITC and make available to it all nonprivileged and nonproprietary information. We will allow the ITC access to all privileged and business proprietary information in the Department's files, provided the ITC confirms in writing 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 May 3, 1990 whether there is a reasonable indication that imports of LSIs from Japan are materially injuring, or threaten material injury to, a U.S. industry. If its determination is negative, the investigation will be terminated; otherwise, the investigation will proceed according to statutory and regulatory time limits.

This notice is published pursuant to section 732(c) (2) of the Act.

Dated: April 9, 1990.

Lisa B. Barry,

Acting Assistant Secretary for Import Administration.

[FR Doc. 90-8805 Filed 4-16-90; 8:45 am]

BILLING CODE 3510-DS-M

APPENDIX C

LIST OF WITNESSES WHO APPEARED AT THE CONFERENCE

CALENDAR OF PUBLIC CONFERENCE

Investigation No. 731-TA-455 (Preliminary)

MULTI-ANGLE LASER LIGHT SCATTERING INSTRUMENTS AND PARTS THEREOF FROM JAPAN

Those listed below appeared at the United States International Trade Commission's conference held in connection with the subject investigation on April 11, 1990, in the Hearing Room of the USITC Building, 500 E Street SW., Washington, DC.

In support of the imposition of antidumping duties

Wyatt Technology Corporation
Santa Barbara, CA

Dr. Philip J. Wyatt, President
Geofrey K. Wyatt, Executive Vice President

In opposition to the imposition of antidumping duties

Arnold & Porter--Counsel
Washington, DC
on behalf of--

Otsuka Electronics Co., Ltd. (Japanese producer/exporter)
Photal Division

Kenji Nakayama, President

Dr. Frank E. Karasz
Distinguished University Professor
Department of Polymer Science and Engineering
University of Massachusetts
Amherst, MA

Dr. Andrew Blow
Polymer Laboratories Inc., Chief Executive Officer
Separation Science Division
United Kingdom

Dr. John MacKay, Director of International Business
Otsuka Electronics (USA), Inc.
Havertown, PA

Patrick McClory)
Matthew Seiden) --OF COUNSEL

APPENDIX D

PERCENTAGE CHANGES IN MARKET DATA

Table D-1
Laser light-scattering instruments: Percentage changes in market data, 1987-88, 1988-89

Item	1987-88	1988-89
Apparent U.S. consumption:		
Quantity	***	***
Value	***	***
Market shares:		
U.S. producers:		
Quantity	***	***
Value	***	***
Imports from Japan:		
Quantity	***	***
Value	***	***
U.S. producers'--		
Production capacity	***	***
Production	***	***
Capacity utilization	***	***
Domestic shipments:		
Quantity	***	***
Value	***	***
Unit value	***	***
Export shipments:		
Quantity	***	***
Value	***	***
Unit value	***	***
Internal consumption	***	***
End-of-period inventories	***	***
Employment:		
Production and related workers	***	***
Hours worked	***	***
Hourly wages	***	***
Manhours required to produce one instrument	***	***
U.S. importers'--		
Imports from Japan:		
Quantity	***	***
Value	***	***
Unit value	***	***
End-of-period inventories	***	***

Source: Compiled from data presented in the section of this report entitled "Information Obtained in the Investigation."

APPENDIX E

COMMENTS RECEIVED FROM U.S. PRODUCERS ON THE IMPACT OF IMPORTS OF LASER LIGHT-SCATTERING INSTRUMENTS ON THEIR GROWTH, INVESTMENT, ABILITY TO RAISE CAPITAL, AND EXISTING DEVELOPMENT AND PRODUCTION EFFORTS

The Commission requested U.S. producers to describe and explain the actual and potential negative effects, if any, of imports of multi-angle laser light-scattering instruments from Japan on their existing development and production efforts, growth, investments, and ability to raise capital. * * *.