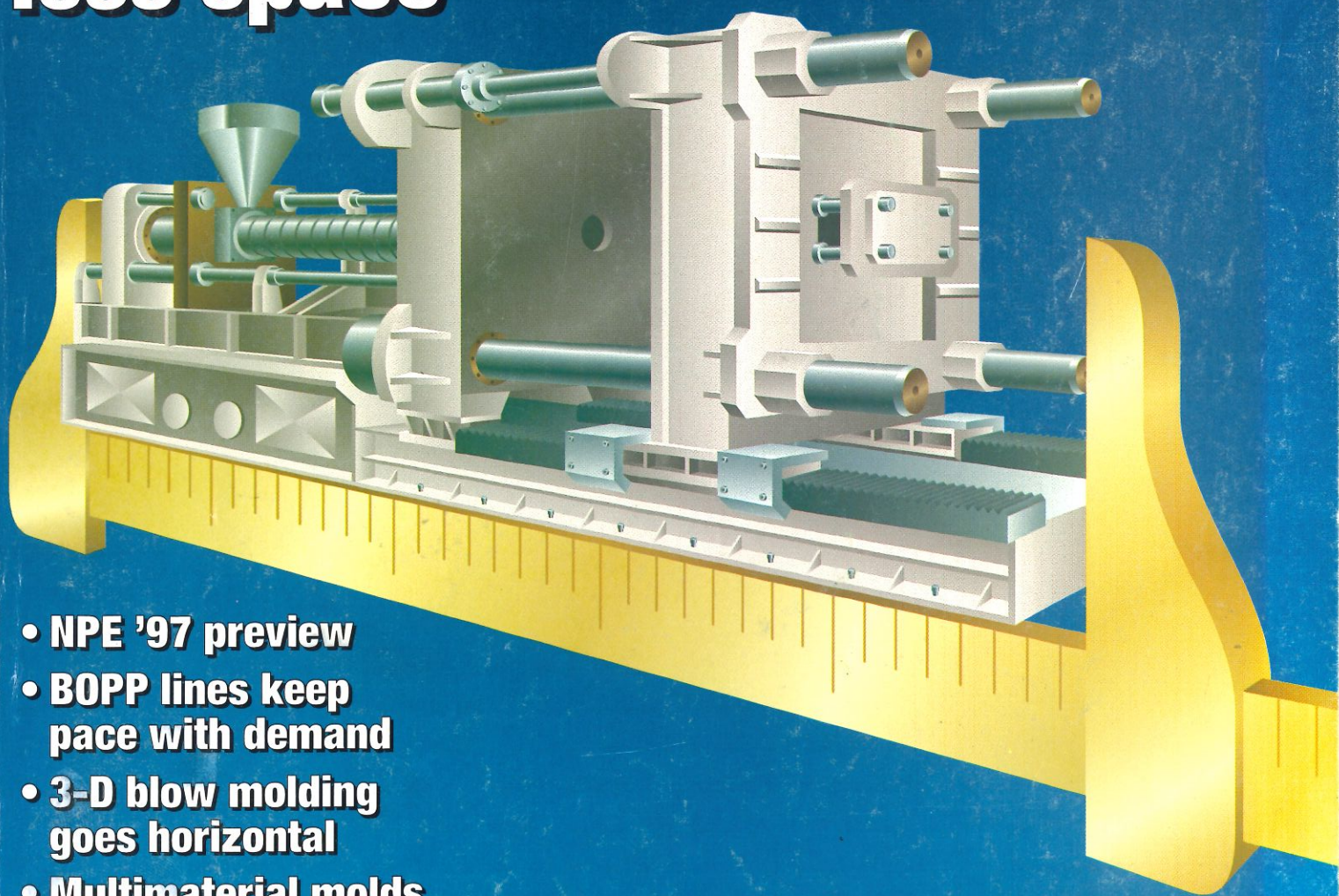


A PUBLICATION OF THE MCGRAW-HILL COMPANIES

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MODERN PLASTICS INTERNATIONAL

**Two-platen machines:
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A close look at the numbers finds that up to 30% of Commerce Dept. machinery import data is suspect^a

	1995 ^b		1996 ^b	
	Thermoplastic	Thermoset	Thermoplastic	Thermoset
Jan	322 (90)	145 (57)	289 (57)	140 (30)
Feb	472 (218)	210 (121)	300 (100)	101 (24)
Mar	422 (115)	130 (42)	384 (66)	100 (4)
Apr	427 (66)	153 (54)	379 (165)	90 (14)
May	387 (87)	103 (27)	322 (64)	122 (23)
Jun	378 (37)	139 (11)	276 (50)	81 (1)
Jul	325 (53)	109 (19)	330 (77)	93 (1)
Aug	262 (50)	101 (20)	293 (75)	85 (26)
Sep	265 (72)	170 (12)	344 (146)	65 (1)
Oct	290 (113)	112 (15)	376 (134)	112 (2)
Nov	298 (106)	100 (21)	460 (249)	107 (18)
Dec	308 (121)	94 (24)	307 (52)	100 (17)
TOTALS	4156 (1128)	1566 (423)	4060 (1235)	1196 (161)
SUSPECT IMPORTS	27.14%	27.01%	30.4%	13.46%

a: Figures are for imports of thermoplastic and thermoset injection machines of all sizes to U.S. ports in 1995 and 1996. These numbers do not include shoe machines or laser-disc machines.
b: Unbracketed figures are the total number of machines imported. Bracketed numbers are the amount of alleged machines to be suspect.

Source: Robert Branand Intl., Washington, DC.

Committee will work with the DOC to improve import-data accuracy.

Accurate data are important for a variety of reasons, observers say. Lawmakers can use the numbers to influence trade legislation; stock analysts can use them to identify market share and market trends of publicly traded companies; and banks can use them to determine if the industry is healthy enough to capitalize a machinery-maker's - or even a processor's - business plans.

The investigation of the data was conducted by Robert Branand of Robert Branand Intl., a trade services firm in Washington, DC, USA, whom Cincinnati Milacron has instructed to work with the SPI in resolving this issue. During an interview, Branand said he reviewed import figures compiled from Jan. 1, 1995 to Jan. 1, 1997. During this period 11,752 injection machines of all sizes and types were listed by the DOC as imported. Of this total, Branand identified 3303, or 28%, as being suspect (also see table).

Branand focused his efforts on machines with a declared value of \$50,000 or less, because it is easier to spot discrepancies in product classifications in this range. For the two-year period he says that 29.9% of thermoplastics machine shipments were suspect.

Noting that almost no injection machine costs less than \$20,000, Branand cited these findings:

■ In May 1995, the port of St. Al-

bans, VT, USA, received 31 items from Italy listed as injection machines; each had a declared value of \$1558.

■ In September 1995, twenty-five items listed as injection machines came through Buffalo, NY, USA, from Germany with a value of \$840 each.

■ In September 1996 eighty-three items listed as injection machines were received in Philadelphia from Germany, valued at \$1081 each.

Branand does not attribute the errors to fraud, but rather to mistakes or ineptness in paperwork.

The misclassification of the aluminum ingots is a case in point. Twenty-three shipments of ingots from Mexico were received at Laredo, TX, USA. They were designated as 23 injection molding machines because they were purchased for mold-making, an association which led the forwarder to label them machines.

One of the more eye-opening examples of misvalued imports was six shipments of laser-disc molding machines that were received in New York City. Each was valued at less than \$7000. The average price for such lines as quoted by the world's largest supplier is \$2.5 million.

Branand says it's difficult to learn the identity of suspect shipments because imports are confidential. His technique is to check publicly available shipping manifests filed with non-governmental sources and flag a shipment valued suspiciously low.

The U.S. Customs Service concedes that the findings have merit. In a letter to Branand dated April 28, Thomas Mattina, director of the Service's South Florida Strategic Trade Center, wrote, "Our...findings support your allegation that the import...statistics for these...machinery items have been overstated."

There appears to be no immediate resolution to this issue. Branand intends to continue his investigation. For now, though, enough data exist to support the SPI's contention that U.S. machinery-import figures are awry. -Patrick A. Toensmeier

INJECTION MOLDING

Innovations surface in tiebarless machine design

Just as Engel gets ready to celebrate the sale of its 7000th tiebarless machine since the model was introduced in 1989, competition in the sector is intensifying.

A unit unveiled recently by Ultra-Tech, Hong-Kong, is destined for production under license in Europe and possibly elsewhere. In addition, the Israeli inventor of a machine first shown by Billion, Bellignat, France, as a prototype in modified form at K'95 has patented a new design. Amir Ziv-Av holds a U.S. patent on his concept, which he de-

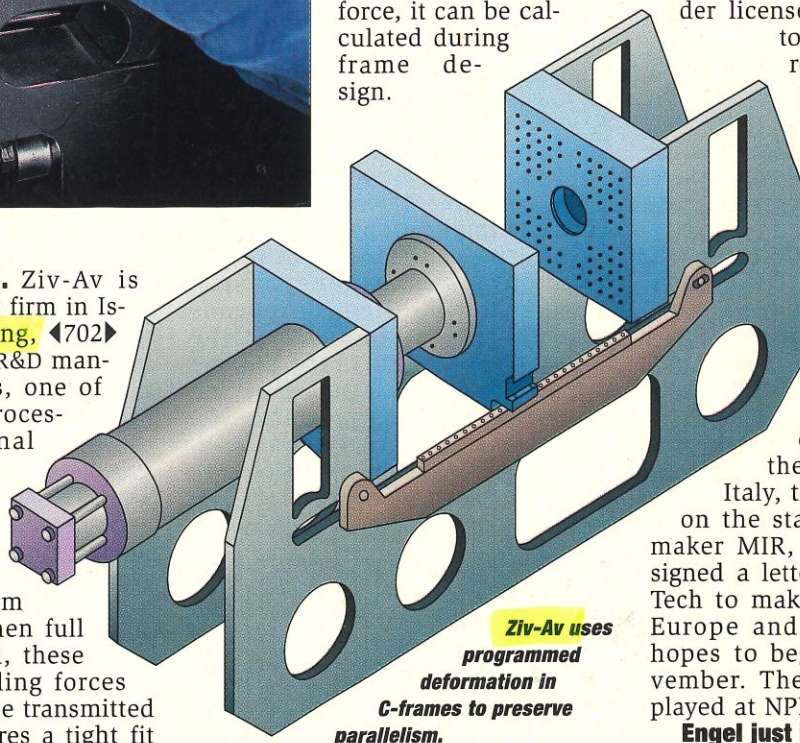
scribes as simpler, lighter, and cheaper than current designs. He is seeking interested manufacturers.

Tiebarless machines offer major benefits. They allow the use of out-sized molds, providing knock-on advantages in cycle-time reductions and energy savings. Engel, 4701 Schwertberg, Austria, says that 40% of tools running on tiebarless machines would not fit on tiebar machines of the same size. Tiebarless units make it easy to load molds by crane (from the top) or forklift (side). And robots have easier ac-



FlexLink on Engel machine facilitates access to ejectors, and is easier to maintain than previous pivoting link.

while sections under the cut-outs undergo much lower compression, but they also arch, causing the support posts to rotate towards each other. Any distortion is well within the elastic limits of the steel used for the frame, and so fully reversible. Because deformation is directly proportional to the applied force, it can be calculated during frame design.



cess for part removal.

Redesign proposed. Ziv-Av is head of an engineering firm in Israel, **Ziv-Av Engineering**, ◀702▶ in Or-Yehuda. He was R&D manager at Ketter Plastics, one of Israel's best-known processors. In his original patent, the main design feature is a pair of C-frames attached to the fixed and rear platens by pivots, which are separate from the machine base. When full clamp force is applied, these C-frames absorb bending forces that would otherwise be transmitted to the base. This ensures a tight fit between platens. Billion machines incorporate modifications to that design, including two lower tiebars, which are said to further ensure platen parallelism.

Ziv-Av says the redesign refines the original. He claims it maintains the horizontal alignment of the platens, and in addition provides support for the moving platen. The two fundamental differences are cut-outs in the supporting posts for the platens, and the use of notches under the support posts. These features cancel out the tendency of the support posts to rotate away from each other as the C-frame opens up under high clamp force.

Sections of the posts above the cut-outs undergo compression,

A second modification concerns the support structure for the moving platen. Whereas in the original design, the platen moved on guides that are part of the machine base, the new patent provides for a floating support structure attached to the clamping frame by pivots, one fixed and one sliding. This loose connection prevents distortion in the support structure as full clamp is applied, and with it a tendency for it to lift up the moving platen as the C-frame opens up. The result is that the platens avoid subjection to unwanted vertical forces.

Ziv-Av has not built prototypes. He says that interested machine builders could adapt an existing de-

sign, preferably with a hydraulic clamping system, since he argues that toggle systems cannot achieve the same level of simplicity. No modifications would be required to the injection side and few to the electronics and hydraulics. "Because the design is so simple, it won't at the beginning cost more than other designs, and has the potential to cost less," Ziv-Av says.

Refining models. In April, a so-called "free-space" machine – it has lower tiebars like the Billion – was unveiled by Ultra-Tech ◀703▶ at the Scanplast show in Gothenburg, Sweden. This prototype was assembled in Denmark, but if demand reaches expectations, it could be built under license elsewhere. According

to Richard Sayer, a co-director of Ultra-Tech who until the mid-1980s was engineering director at Hong Kong-based Chen Hsong (the world's largest injection machine maker), the company's production facilities in Denmark are insufficient for what he hopes will be a requirement of several hundred machines per month. At

the Plast show in Milan, Italy, the machine was shown on the stand of Italian machine maker MIR, ◀704▶ which has just signed a letter of intent with Ultra-Tech to make machines for sale in Europe and North America. MIR hopes to begin production in November. The machine will be displayed at NPE.

Engel just introduced a refinement to its machines: two one-piece castings (left and right) replace the knuckle system used till now to retain platen parallelism. FlexLink, originally developed to improve access to the ejector coupling, has the added advantage of being maintenance-free, since it has no moving parts. According to Otto Urbanek, Engel's technical director, FlexLink "ensures uniform and unchanging applications of stress during its life." The design uses steel's inherent elasticity to absorb stress.

Engel's main rival in tiebarless technology until recently was Germany's Hemscheidt, in Schwerin. That company was bought by HPM, ◀705▶ Mt. Gilead, OH, USA, in March. HPM says Hemscheidt's