



# MEMBER SPOTLIGHT



## TECHNOLOGY LICENSING PERMITS JAPAN STEEL WORKS TO LAUNCH A NEW PLASTICS MANUFACTURING PRODUCT

Japan Steel Works (JSW), a leading manufacturer of high grade quality steel, and industrial and plastics processing machinery, puts the information and knowledge it acquires at MIT to real use in new product development.

Founded in 1907 as a manufacturer of industrial equipment, JSW has a relationship with MIT that dates back over a century. Baron Takuma Dan, who served as Chairman of JSW in the early 1920s, graduated from MIT in 1878 and was among the first foreigners to be educated at the Institute. As Chairman of JSW, Baron Takuma Dan brought modern management into JSW and initiated close research ties with MIT in the area of machine engineering—ties that have since transformed but remain strong. Today, JSW's R&D focus is in the advanced materials, optics, magnetics, electronics, and biotechnology fields. Its portfolio has expanded to include the production and sale of industrial and plastic processing machinery to the clients in the chemical, petrochemicals, energy, utilities, electronic and automobile industries. By providing access to information and research in these areas, MIT continues to support the evolution of JSW's business.

Access to customized briefings on research activities at the Institute is an important component of JSW's membership in the Industrial Liaison Program (ILP). Through interaction with world-renowned faculty and researchers at MIT, JSW not only gains valuable insight into a variety of issues relevant to its core business units—innovative engineering techniques, novel materials, smart management practices—but also identifies ways of directly implementing what it learns in Cambridge to its plants in Asia.

Together with a number of other Mitsui companies, JSW first engaged the ILP in 1974 to explore cutting-edge technologies and materials being developed at MIT labs that had potential applications to its industrial and plastics machinery business. "The ILP keeps JSW up-to-date on the latest research and innovations," notes JSW's senior advisor Yoshio Kondo. JSW takes full advantage of its ability to request briefings

from professors and visits of company personnel to campus as a way of helping it find the new materials, engineering technologies, and business management practices that help it maintain its competitive advantage.

A notable case in point involved a 1994 visit to campus during which JSW representatives were introduced to a material that represented a potentially revolutionary addition to the company's growing business in plastics manufacturing equipment. The material, Microcellular (MuCell) Plastic, was developed and patented by Dr. Nam P. Suh in the MIT Department of Mechanical Engineering. The plastic can be used to create foamed plastics with cell sizes between 0.5-100 mm, which reduces material weight by 10-30% while retaining the structural stability of heavier, non-foamed plastics. MuCell not only makes strong lightweight products possible, but its low polymer viscosity also reduces clamping force, extruding torque, and injection and extruding pressure.

JSW recognized that incorporation of MuCell technology into its own plastics manufacturing equipment could deliver a wide range of benefits to its customers, including shorter molding cycles, increased capacity, and improved part quality in terms of dimensional stability due to the elimination of shrinkage and warpage. Yukio Mende, MuCell system group manager in the machinery division, lauded the uniqueness of the material, noting that it "reduces production costs and provides remarkable results." Given its clear advantages, JSW seized on the opportunity presented by MuCell, and took it to market.

JSW negotiated and secured a licensing agreement with Trexel Inc. of Boston, Massachusetts, which was the exclusive licensor of the MuCell technology. In 1999 JSW signed agreements with Trexel for the exclusive manufacturing rights in Japan for MuCell injection molding machines. In 2000, JSW also obtained the exclusive manufacturing and distribution rights for

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MuCell extruders in Japan, Korea and Southeast Asia.

On the basis of these agreements, JSW has since developed MuCell applied injection molding machines and sold them to leading companies in Japan and Southeast Asia for further testing and development. JSW anticipates sales of equipment based on MuCell technology in the range of several million dollars per year. Speaking of the ILP's role in bringing this technology to JSW, Kondo remarks, "without the help of the ILP, it would not have been easy to find and interact with the people who made this JSW success possible."

*For more information about how we can put the resources of MIT to work for you, call the Industrial Liaison Program at 1-617-253-2691, e-mail us at [liaison@ilp.mit.edu](mailto:liaison@ilp.mit.edu), or visit <http://ilp-www.mit.edu/>*