MKM Invests in Next-Generation Catalytic Converter Market by Buying Sendzimir

If it weren't for the internal combustion engine, we wouldn't be able to live more than a mile or two from work, enjoy fresh strawberries in winter, or thrill at the sensation of speeding along the highway. We also wouldn't have the unattractive, corrosive, and sometimes life-threatening pollutants that are created by the combustion of the fuel – gasoline – that powers our automobiles. The reason? Our engines fail to burn gasoline completely, producing undesirable quantities of CO, NOx, and HC instead of the harmless H2O, CO2, and N that we would prefer.

The United States first tackled this problem in 1975, when the federal government required that all new cars be equipped with a two-way catalytic converter. This device, acting as an afterburner to the engine, oxidized emitted HC and CO to CO2 and H2O. In 1981, the three-way catalytic converter was introduced, adding the reduction step that changes NOx into N and O2. It is estimated that contemporary catalytic converters, combined with oxygen sensors, fuel/air ratio controls, exhaust gas recirculation valves, and similar improvements, have reduced emitted pollutants to almost 10% of their untreated volume.

However, an estimated 30 million new cars worldwide are added to our roads each year, effectively nullifying the pollution savings that have been achieved to date. Moreover, existing converters are still inefficient. For example, even under optimal conditions, they take too long to heat up (it is estimated that a minimum of 30 seconds pass before a catalytic converter reaches its approximately 660° F [350° C] operating threshold). Governments are therefore enacting even stricter pollution emission guidelines. In Europe, for example, limits in 2005 will be less than half those currently tolerated in the United States. Manufacturers of catalytic converters must come up with better products.

In 1995–98, Krupp VDM, Emitec GmbH—the world's largest manufacturer of metal catalytic converters—the Fraunhofer Institute for Applied Materials Research, and Wuppertal University developed a new material—Aluchrom YHf — whose cousin, Aluchrom 7Al YHf, promises to meet these new standards. Aluchrom 7Al YHf is an alloy of chromium, iron, and rare earth elements with as much as 7% aluminum by weight. This composition can heat up faster than any other material used in catalytic converters because of its relatively high thermal resistivity and its ability to be rolled to as thin as 0.001 inch (0.025 mm) without jeopardizing the material's operating life. Moreover, the extreme thinness maximizes surface area, and thus catalytic efficiency, without increasing the weight or volume of the unit or its resistance to airflow. Others are producing variations on this alloy, but Aluchrom apparently has the greatest life.

MK Metallfolien GmbH (MKM), established in 1999 to roll ultrathin foil, is investing $10 million in a sendzimir ZR 24C-15, a slitting line, and related equipment that will roll materials such as Aluchrom 7 Al YHf to ultrafoil thinnesses of 0.0008 inch (0.02 mm) at custom widths. After numerous trials throughout Europe, it was found that sendzimir equipment rolls the new Aluchrom alloy the most economically and with the best results. MKM's plant in Hagen, Germany, operating as a reroller and service center, will bring product available on the market up to the specifications of companies manufacturing items such as catalytic converters. The company will offer just-in-time delivery of custom orders, with sendzimir-equipment quality and modern service standards.

The sendzimir ZR 24C-15 is being built by Intergrated Industrial Systems, Inc. (I2S) of Yalesville, Connecticut. Mechanical engineering is being done by T. Sendzimir, Inc., of Waterbury, Connecticut. The mill, which is scheduled to start operating in 2000, incorporates numerous T. Sendzimir designs, including the monobloc housing with As-U-Roll crown control with direct-acting hydraulic cylinders, hydraulic lateral adjustment of the tapered first intermediate rolls with direct-acting hydraulic cylinders, and Pollastrelli wipers. The ZR 24C-15 has a nominal work roll diameter of 0.844 in (21.4 mm) and will roll 15-inch strip at speeds of 984 fpm (300 mpm) down to 0.0008 in (0.02 mm). It is the first mill ever designed specifically to roll Aluchrom to these specifications.