

Volume II: *Fundamentals of Injection Molding Series*

Plastic Injection Molding

... material
selection and
product design
fundamentals

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Society of Manufacturing Engineers



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Understanding the Injection Molding Process 1

EVOLUTION OF THE PROCESS

In 1868, a gentleman by the name of John Wesley Hyatt developed a plastic material called *celluloid* and entered it in a contest created by a billiard ball manufacturer. The purpose of the contest was to find a substitute for ivory, which was becoming expensive and difficult to obtain. Celluloid was actually invented in 1851 by Alexander Parkes, but Hyatt perfected it to where it could be processed into a finished form. He used it to replace the billiard ball ivory and won the contest's grand prize of \$10,000, a rich sum in those days. Unfortunately, after the prize was won, some of the celluloid billiard balls exploded on impact during a demonstration (due to the instability and high flammability of the material) and further refinement was required to use it in commercial ventures. Nonetheless, the plastics industry was born, and it would begin to flourish when John Wesley Hyatt and his brother Isaiah patented the first injection molding machine in 1872. They used this machine to injection mold celluloid plastic. Over the next 40 to 50 years others began to investigate this new process and expand its application to manufacturing such items as collar stays, buttons, and hair combs. By 1920, the injection molding industry was well entrenched, and it has been booming ever since.

During the 1940s the industry exploded with a bang (*not* because of the instability of celluloid) as World War II created a demand for inexpensive, mass-produced products. New materials were invented for the process on a regular basis, and technical advances resulted in more and more successful applications.

CHARTING INDUSTRY EVOLUTION

From its birth in the late 1800s, to recent developments and applications, the injection molding industry has grown at a fast and steady rate. It has evolved from producing combs and buttons to molding products for all production fields, including automotive, medical, aerospace, and consumer goods, as well as toys.

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