SPECIAL PRESSES FOR BLADDER MOLDING

REP has a team of engineers working on the design and production of optimized molding presses intended for special applications. Bladder molding for the production of tires is one of them. REP has supplied injection molding presses for bladder molding applications to the biggest manufacturers for thirty years.

What is a bladder?

A bladder is a rubber-made curing bladder used for tire curing.
The bladder is placed inside the "green" tire (uncured) which in turn is placed in a curing mold. When the mold is closed, the bladder is inflated by steam injection, in order to cause the uncured tire to be pressed against the inner curing mold surface while being heated up.
The bladders of variable shape and thickness depending on the type of tires (generally from 4.1 mm to 9.1 mm) were usually compression molded.

REP Press Bladder S22

MATTHIEU WOLFF, *PROCESS DEVELOPMENT MANAGER,* explains why to prefer injection for the molding of bladders.

Injection molding has many advantages: as the compound is already heated and stressed inside the extruder, both the cycle time and degassing cycles are reduced. There is less waste. Finally, we can better control the compound flow inside the mold, which is the guarantee for regular bladder thickness. I want to point out here that a compression-molded bladder usually is between 6 and 7 mm thick, whereas an injection-molded bladder is between 4 and 5 mm thick only. Reducing the thickness allows for a more homogeneous pressure distribution against the tire when inflating the bladder. Among other advantages we can mention the consistent surface quality and the improved mechanical properties, which are particularly important when considering that bladders must withstand temperatures of around 180°C and pressures of 25 bar during the whole curing time of the tire (i.e. an average of 15 minutes for a light vehicle tire). Injection molded bladders have a more extended lifespan, up to 500 tires or more. Our customers are unanimous: One of the most important tire manufacturers who has bought a V89 Y85 press recently stated that he can mold 25 bladders per shift without any problem with a low reject rate of 0.5% and a much higher bladder quality than those bought off-the-shelf before.

Moreover, the easy use of REP presses is very appreciated as it enables operators to easily and efficiently handle them.

The bladder press range

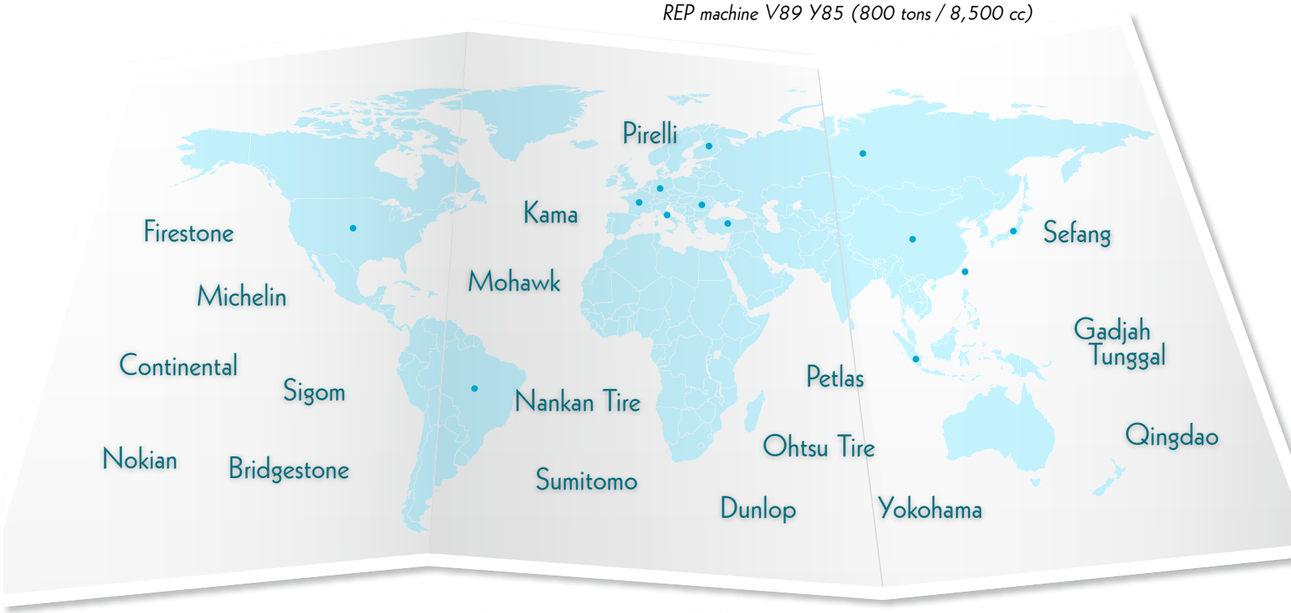
REP regularly manufactures presses for bladder molding applications (for open or closed bladders) with a closing force of 800 to 2,200 tons. An injection pressure of 1,500 bar is usually said to be sufficient, as the compound used for bladders doesn't required high injection pressures. The injection volume may be up to 25 liters in standard applications.

The particularities of these presses mainly focus on the central top and bottom ejectors, the adaptations for the mold heating and the much higher mold thickness and opening stroke characteristics than for most of the remaining applications.

Open bladder mold

Example of a closed bladder

REP machine V89 Y85 (800 tons / 8,500 cc)



Location REP presses: Worldwide references