

Reducing energy consumption in cast polyurethane process



Striking the balance: energy efficiency and performance in cast PU process

A cost-effective and consistent approach

In today's world, the pursuit of sustainable and cost-effective manufacturing processes is more critical than ever. Cast polyurethane parts production stands out for its demanding energy costs. Yet, playing with temperatures significantly impacts the final properties of these parts. This process involves a calculated risk, as any misstep can result in total failure.

Covestro provides enhanced solutions aimed at boosting energy efficiency without compromising on mechanical properties. We thoroughly reassessed every energy-intensive manufacturing steps, including heating of component and mold, curing and post-curing.



We then tailored our formulations to prioritize energy savings while ensuring consistent mechanical performance, thus also meeting the high quality standards our systems are known for.

Benefits of embracing our energy-efficient systems

Innovations in material science, process optimization, and technology integration have paved the way to offer a solution that answers the critical challenge of energy consumption. The benefits are multiple for processors turning to our enhanced solutions.

Cost-effective solution

The primary benefit of these enhanced systems is a significant reduction in energy consumption at every step of the manufacturing process. By adopting more energy-efficient practices, manufacturers can lower production costs and maintain competitiveness in the market.

Performance consistency

One of the key challenges in cast PU process is the impact of temperature on the properties of the finished product. Our enhanced systems optimize the balance between properties and process. This consistency in performance ensures that parts meet quality standards.

Sustainability

Beyond cost savings, reducing energy consumption also contributes to environmental sustainability. Lower energy consumption means reduced greenhouse gas emissions and a smaller carbon footprint for the manufacturing process, in addition to an alignment with global sustainability goals.

Productivity steadiness

The need to vary temperatures can also have an impact on the process itself. While developing our enhanced systems, we therefore focused on minimizing these effects in order to maintain the same level of productivity.

How to achieve energy savings in cast PU process

Sequencing energy expenditure during process

The process of hot cast polyurethane elastomers is energy-consuming. Energy is required, for instance, in each of the following steps:

- Component preheating
- Component processing temperature
- Mold heating
- Curing
- Post-curing

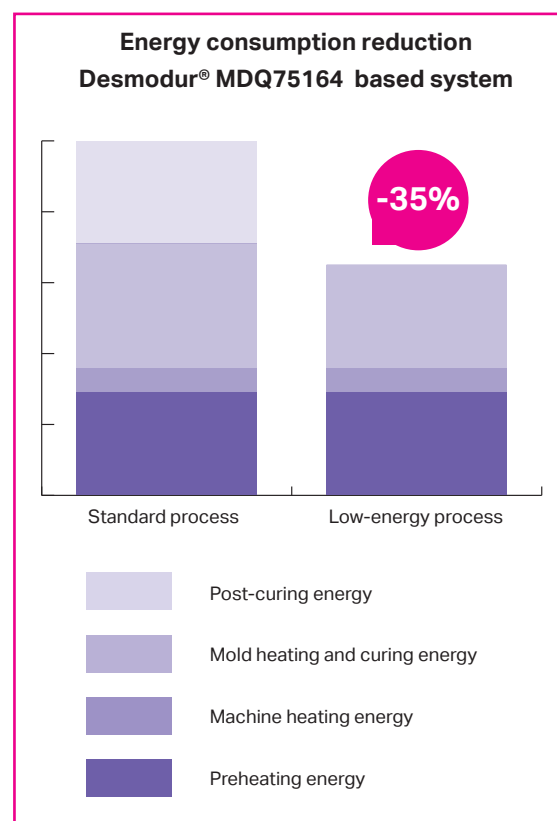
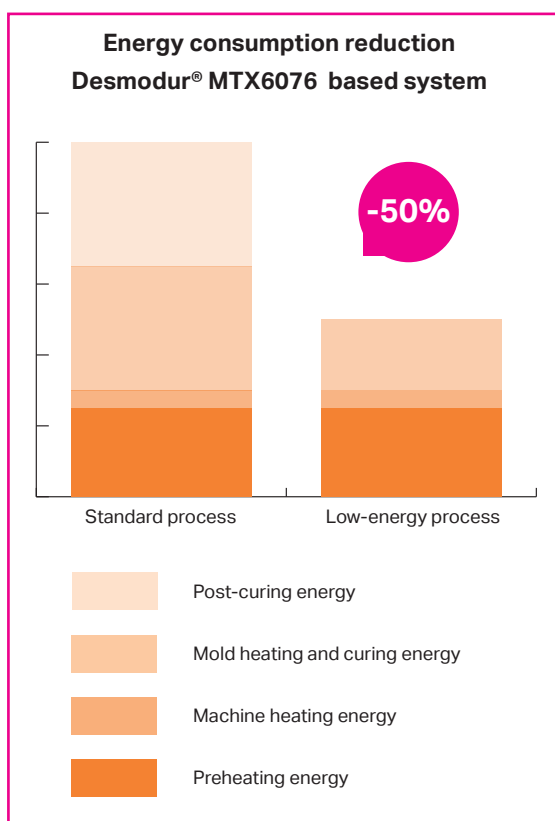
These steps involve a separate oven, a heating table and the dispensing machine itself.

The aim is to control the temperature of the material across the process so as to allow the intended chemical reaction to take place as this is vital for achieving the required mechanical properties. Although it is difficult to adjust the temperature of an individual component, it is possible to adjust certain parameters to optimize energy consumption, in particular the temperature of the mold, and subsequently the curing and post-curing phases.

Evaluating the effects of energy reduction

As temperature modifications have an effect on the final properties, we worked on the formulations to compensate these effects and offer consistency in the resulting mechanical properties.

Our aim is to offer cast PU systems as easy to process as usual in terms of viscosity, pot-life, green strength and final aspect while remaining as performing.





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¹) Please see the «Guidance on Use of Covestro Products in a Medical Application» document.