

AVIENT™

Thermoplastic Elastomers

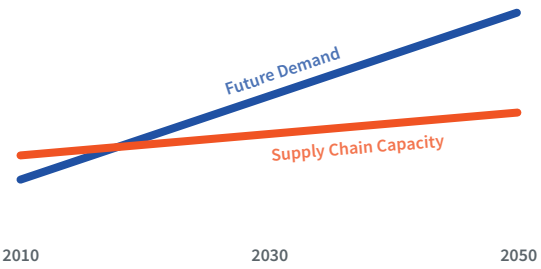
How TPEs can help medical and pharmaceutical manufacturers meet growing global demand

THE OPPORTUNITY: EFFICIENT ALTERNATIVES TO VULCANIZED RUBBER

Is there a capacity crunch on the horizon? You may recognize the two healthcare megatrends that are driving global demand for pharmaceutical packaging, medical devices and drug delivery devices: economic gains in developing nations and an aging global population that requires treatment for chronic conditions.

These sweeping trends have applied intense pressure on manufacturers to produce greater quantities of products in shorter periods of time. The necessary increase in efficiencies has pushed optimization efforts into every facet of product development and distribution—from supply chain through production. And even in this environment, capacity limits loom large.

Needs to Meet Future Growth

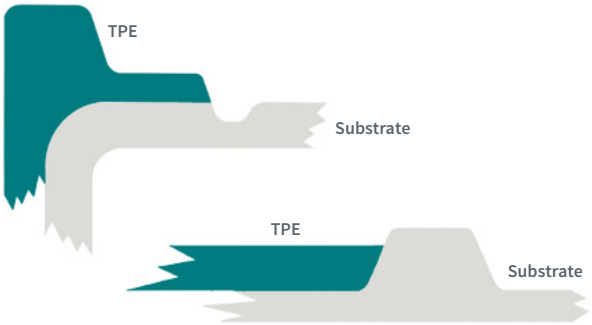


One answer? Look at alternatives to vulcanized rubber. Switching from this time-intensive material may be an important opportunity to streamline production as the industry struggles to keep up with a steady increase in demand.

Manufacturing steps for vulcanized rubber—pre-mixing the formulation, subsequent mixing on a two-roll mill, parts molding and secondary operations, including washing off unreacted surplus materials—present manufacturers with a costly, protracted and outdated process. Given these hurdles, brand owners are looking for new ways to integrate faster throughput and greater scalability into their supply chains while controlling costs. One proven approach is to replace traditional vulcanized rubber materials with thermoplastic elastomers, better known as TPEs.

THE SOLUTION: EVOLVED TPEs PERFORM FOR HEALTHCARE APPLICATIONS

Recent thermoplastic elastomer advancements give manufacturers the ability to use specialized TPEs for healthcare to modernize processing and minimize secondary operations. This, in turn, raises productivity and reduces system costs. Because they remove the need to wash products and simplify bonding to rigid substrates, TPEs require only one to two minutes of processing time from start to finish, and are ideal when producing dynamic and static seals, liquid storage and delivery packaging, and infusion therapy devices.



Specifically, here are five ways TPEs can help the healthcare industry meet an anticipated capacity crunch:

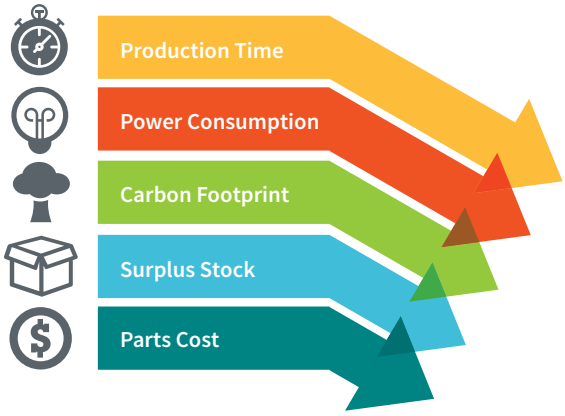
1. **Operational Improvements**
   TPEs create the opportunity to reduce both stock items and work in progress, resulting in more efficient use of working capital. Productivity improvements shorten production days to meet tighter deadlines. Also, energy and labor savings translate to lower power consumption and an improved utilization of staffing.
2. **Commercial Improvements**
   Lower part costs improve margins and increase competitive edge. TPEs also allow for greater design freedom, an extended product portfolio and lower extractables. Additionally, TPEs help to generate lead-time enhancements and feed into capacity utilization improvements.

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3. **Ergonomic Enhancements**
   TPE soft grips can also optimize medical practitioners' control of surgical instruments during procedures and protect expensive handheld diagnostic devices. In addition, when used to produce easy-open pill bottles in various colors that can be clearly identified, TPEs aid arthritic patients while they self-administer medications at home.
4. **Brand and product identification**
   TPEs can be colored to match unique colors for improved product branding. In addition, brand owners can readily include additives that identify authentic products, allowing them to combat counterfeit versions TPEs can also assist with fast visual identification at point-of-sale or during administration.
5. **Sustainability**
   TPEs alleviate the need to wash end products as is required with vulcanized rubber. This results in reduced energy consumption. TPEs can also be reprocessed and made into different products.

TPE Benefits

TPEs can reduce:



TPE Applications

TPEs can used to produce:



Easy-to-open pill bottles

Better grips on instruments

Easy branding

A COMPARISON: THE ECONOMIC CASE FOR TPEs

Although vulcanized rubbers are initially an economical choice, processing presents many drawbacks that can wipe out these cost benefits. For example, the vulcanization, or curing, step requires chemicals such as sulfur and zinc as cross-linking agents. Any unreacted agents must be washed away after molding the rubber part to prevent them from leaching into pharmaceutical products or interacting with rigid substrates. The vulcanization and post-cure steps can lengthen the process by hours and requires environmentally appropriate disposal of the washing agents. In addition, production costs increase, as rubber parts typically require deflashing and assembly using adhesives.

By choosing TPEs, manufacturers can achieve the desirable flexibility, low modulus, and soft touch properties of vulcanized rubber, while adding processing advantages and the potential for recycling. Medical grade TPEs have extremely low levels of leachables and extractables, and are available in several different formulations to address specific processing and end product requirements.



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CONCLUSION: HOW CAN TPEs HELP YOU?

You have an opportunity to drive growth by addressing global demand for your products, which is spiking in direct response to the needs of elderly patients and the increasing number of middle-class consumers in China, India and Brazil, among other nations. Broadened healthcare access, coupled with ongoing economic improvements, has the potential to accelerate demand even further. Pharmaceutical and medical device companies like yours are looking for new strategies to improve operational efficiencies so you can meet current requirements and scale up for the future. Because of their stringent regulatory compliance, healthcaregrade TPEs can help to bypass certain layers of red tape in order to get products to market faster. They may enable you to bolster your sustainability profile by removing potentially harmful chemicals from your process. By utilizing faster manufacturing methods, TPEs can help you accelerate efforts to meet cost saving goals with improved operational performance. Lastly, unlike vulcanized rubber, TPEs offer nearly unlimited color choices for your products and packaging.





TPE IMPLEMENTATION CONSIDERATIONS

Through globally established relationships with toolmakers and machine producers, Avient has a comprehensive understanding of manufacturing challenges and solutions in this arena. If you're considering a switch to TPEs, our expert team can consult on:

- Part design
- Application environment
- Tooling and machine selection

For additional information on the opportunities associated with TPEs, call us at **+1.844.4AVIENT (1.844.428.4368)** or visit **avient.com.**

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