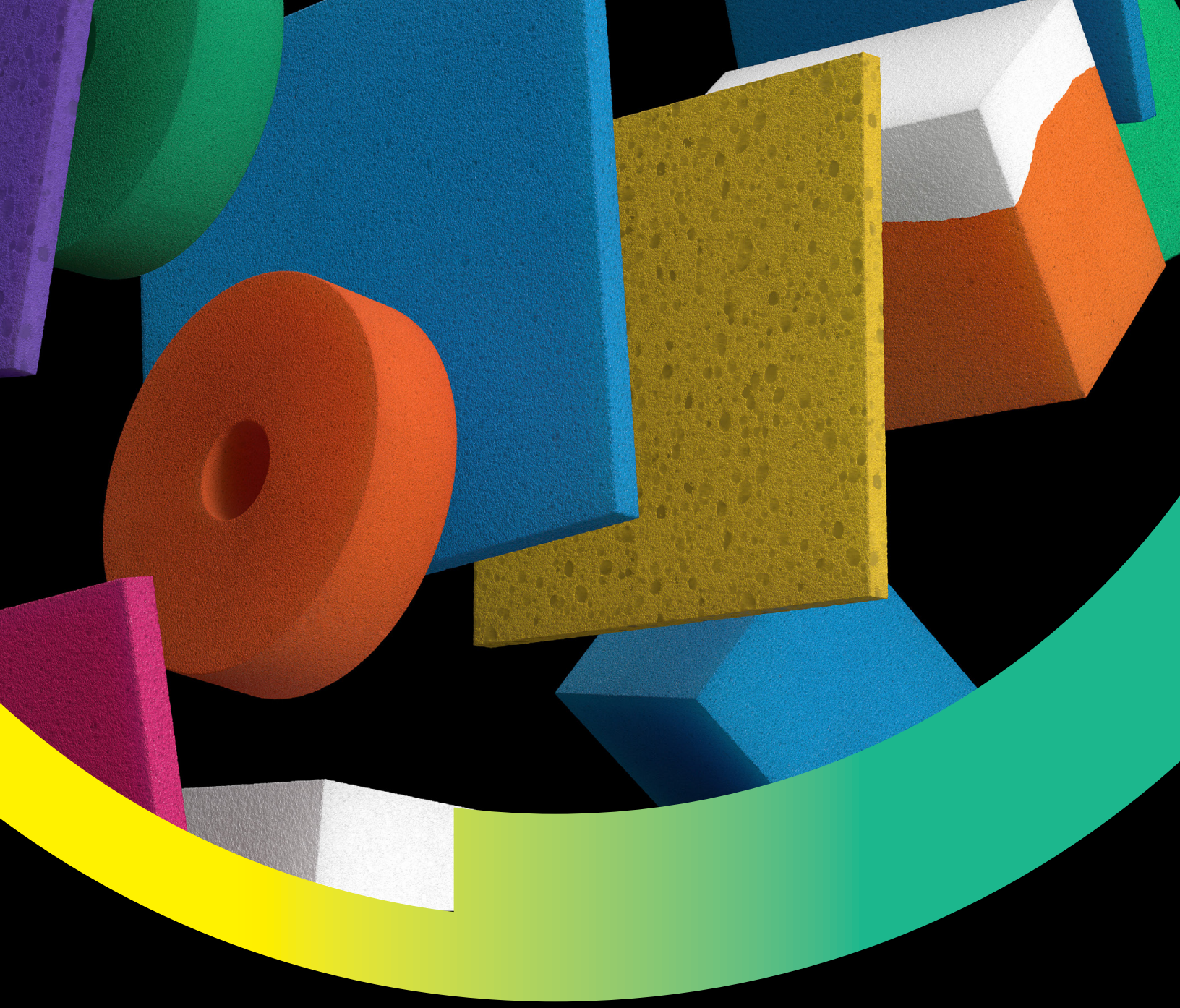


The Chemistry Behind Your Comfort

Raw Materials for Flexible Polyurethane Foams

covestro

The Chemistry Behind your Comfort Starts with Covestro

Memory foam mattresses, mattress toppers, couches, pillows and more: what do these sleep applications have in common? For one – polyurethane.

At Covestro, we are at home with foam. As the inventor of polyurethanes, our portfolio of polyurethane raw materials lend outstanding comfort to cushions, mattresses and bedding, enhancing quality of life… and sleep.

We offer a complete family of flexible slabstock polyol and isocyanate materials which are used to produce today's most comfortable applications: mattresses, bedding and soft furniture. We closely collaborate with our customers and partners to meet the needs of the furniture, mattress and bedding industries.

Our foam innovations are extensively tested for key properties. In house, our chemists are able to test properties such as airflow, firmness, compression sets and tear strength – to ensure that our materials are the best possible match for your comfort products.

We hope this guide will help you to determine which of our excellent polyurethane raw materials will meet your needs! Plus, our R&D team has the technical expertise to help meet many of your needs.

For more information, see our raw material product guide or reach out to your Covestro account or technical service representative.

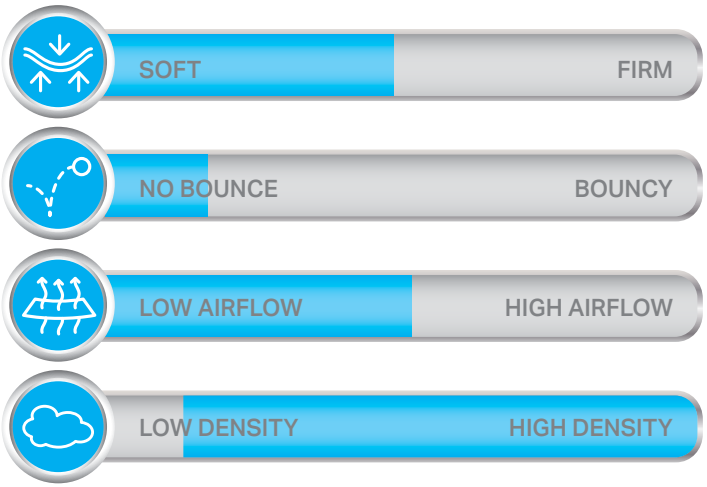
Our product lines include:

- **Softcel®** for viscoelastic memory foams and other specialty foams
- **Ultracel®** for high resilience (HR) foams with excellent support factors
- **Arcol®** and **Multranol®** polyols and polymer polyols for conventional and HR foam applications
- **Mondur®** TDI and MDI isocyanates

Memory Foam

Viscoelastic Foam & Pneumatic Foam

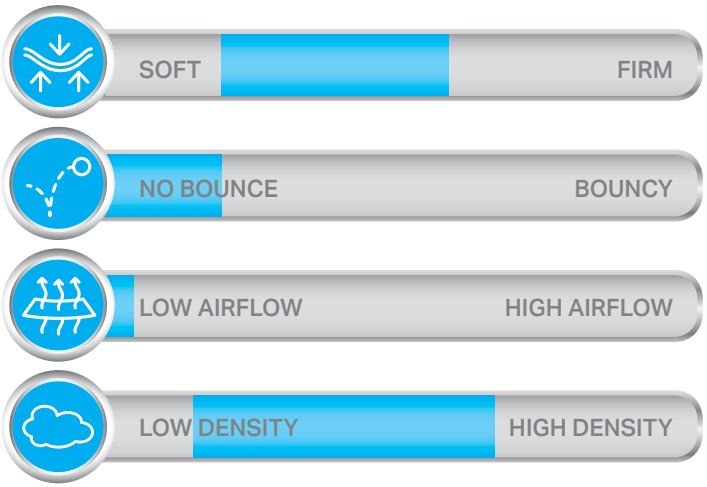
Viscoelastic Foam Attributes:



What makes viscoelastic foam unique? It "remembers" you! Commonly known as memory foam, viscoelastic foam contours to the pressure of your body, has low resiliency and is slow to return to its original shape. These properties make viscoelastic foam the ideal material for the top layers in a mattress or mattress topper.

Viscoelastic foam mattresses are proven to isolate motion and reduce pressure points for a more restful night's sleep. These foam types have low compression sets and high tear strengths, making them ideal for bed in the box applications. Additionally, viscoelastic foams have low glass transition temperatures, which means that they exhibit minimal changes in firmness as the room temperature or body heat fluctuates.

Pneumatic Foam Attributes:



Another type of memory foam, pneumatic foam, is characterized by extremely low airflow. The low airflow gives pneumatic foam a very slow recovery and a very unique feel to the top layers in a mattress or pillow.

Benefits of Memory Foams:

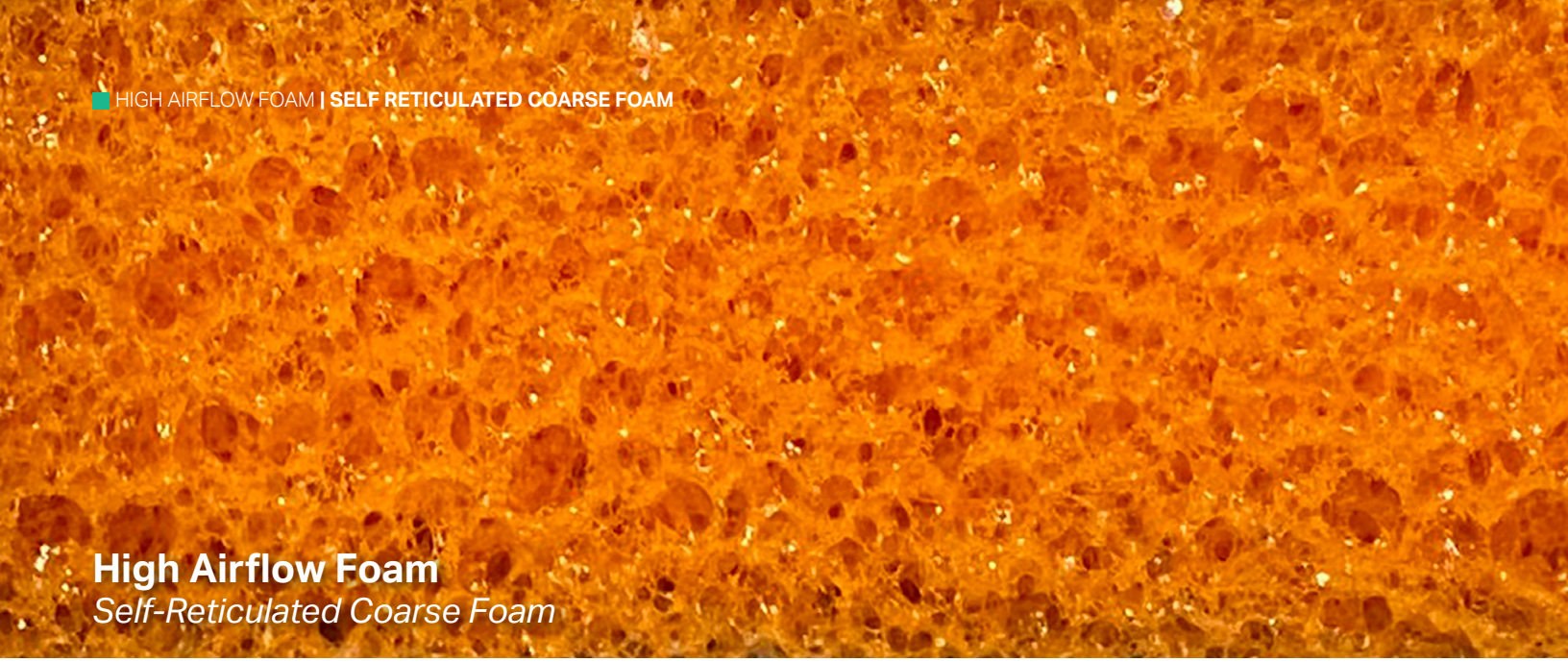
- Alleviates pressure on your body: Viscoelastic foam contours to your body shape, helping to alleviate pressure points and sleeping pain
- Durable: Viscoelastic foams have good durability, low compression set and high tear strength characteristics that make it ideal for bed-in-the-box applications
- Good motion isolation: Since foam is slow to recover to its original position, you are less likely to feel your partner's movements
- Consistent softness: Unlike traditional viscoelastic foam, foams that are made with our VE1800 material stay the same firmness throughout the night

Other Potential Uses:

- Pillows
- Mattress toppers
- Soft furniture (sofa, chaise, chair, ottoman, etc.)
- Athletic shoe insert
- Vibration dampening in applications from cell phones to automotive to buildings
- Medical applications such as hospital bedding, wheelchair seats

Raw Materials:

- Polyol: Softcel® VE-1800
- Isocyanate: Mondur® 3694 MDI or Mondur® TD80



High Airflow Foam

Self-Reticulated Coarse Foam

High Airflow Foam Attributes:

High airflow foam has a web-like, or "reticulated," appearance and can be made with cell structures ranging from fine to coarse. Because of its open cell structure, high airflow foam is extremely breathable, allowing body heat to flow away from the surface of your mattress. When used as a top layer, this very open foam type helps body heat dissipate through the layers away from the sleeper.

What does this mean for the sleeper? The reticulated foam layer allows for better air circulation for a cool, sweat-free sleep.

High airflow foams can range in densities and firmness, making them well-suited for furniture applications. Additionally, because of its open cell structure, this foam type can be used for outdoor furniture and marine applications because water and air flows through it instantly. This type of foam also works well as a filter for applications such as water purification, gutter guards, air filters, appliances and more.

Benefits of High Airflow Foams:

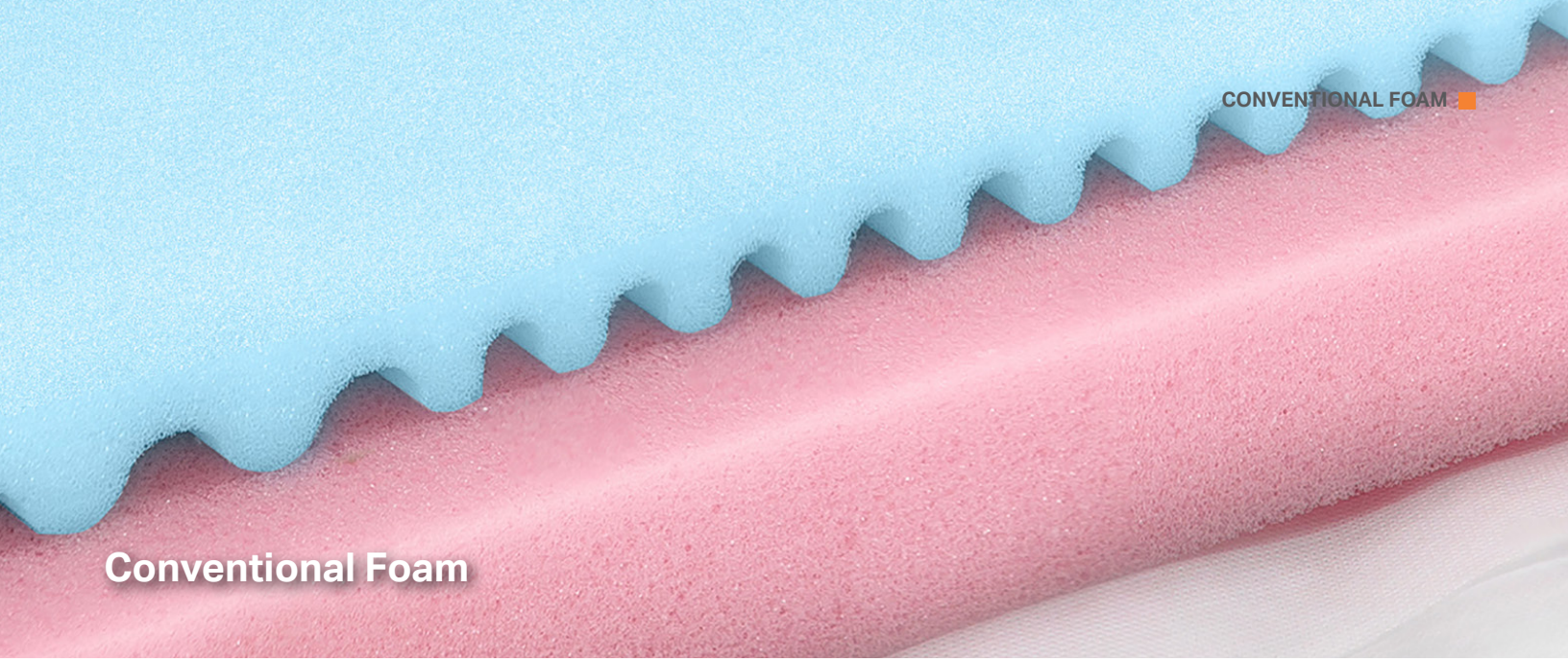
- Temperature control: This open-celled foam allows air to circulate away from the top layer of your mattress, so that you sleep more comfortably and coolly
- Quick drying: Open foam allows good airflow for rapid moisture removal
- Foam types: Broad range of densities and firmness can be obtained

Other Potential Uses:

- Outdoor furniture
- Marine applications
- Filter foams

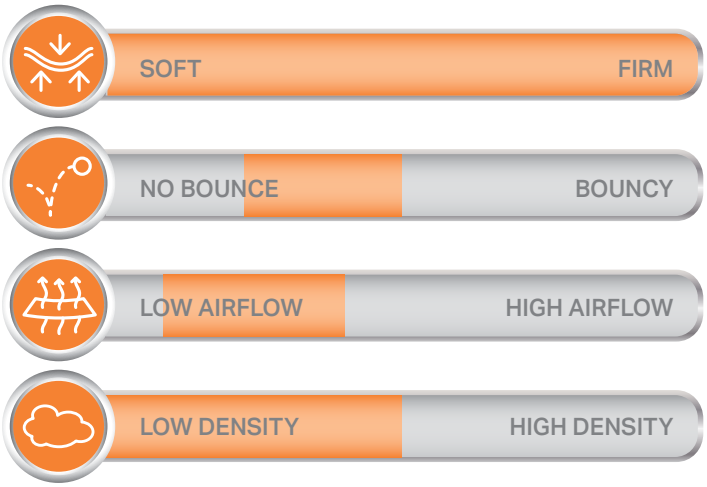
Raw Materials:

- Polyol: Multranol® 9199 and Arcol® F-3040
- Isocyanate: Mondur® TD80



Conventional Foam

Conventional Foam Attributes:



Conventional polyurethane foams give your mattress a uniform, supportive feel, and can often be found as a thick base layer in today's foam mattresses. This type of foam can range from very soft to very firm based on the end use requirements . This foam is generally less dense than other foam types, which enables lightweighting and easier transport. This lightweight support also makes conventional foam ideal for soft furniture.

Benefits of Conventional Foam:

- Sleep support: Offers excellent support for broad range of body types
- Versatile: Wide range of firmness available
- Low density: Ideal for lightweight applications
- Durable: Long lasting support

Other Potential Uses:

- Layers in a mattress
- Furniture
- Packaging
- Automotive applications
- Apparel
- Miscellaneous novelty products

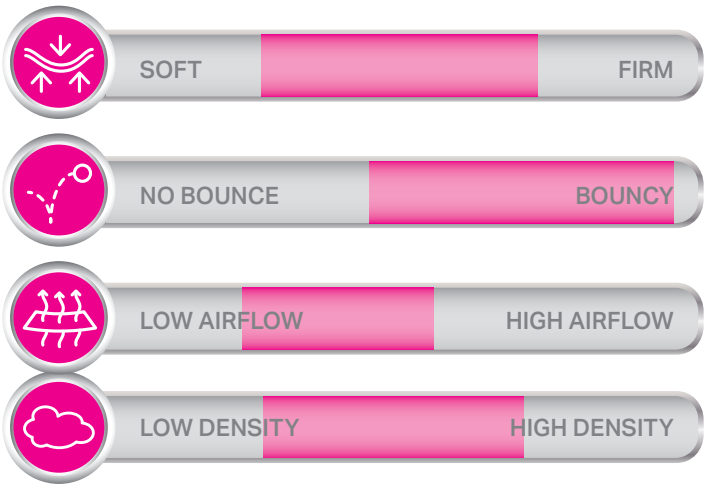
Raw Materials:

- Polyols: Arcol® F-3040, Arcol® HS-200
- Isocyanate: Mondur® TD80

High Support Foam

High Resilience (HR) Foam

HR Foam Attributes:



High resilience foam has a much higher responsiveness than memory foam. Because of this, those that enjoy more of a bounce in their full foam mattress will gravitate towards this type of foam.

This foam type also contributes to a more even feel across the mattress, and less of a sinking feeling than memory foam alone would exhibit.

High resilience foams are also the ideal material for premium furniture seating applications.

Benefits of HR Foam:

- High resilience: Bouncy with a spring-like feel
- Supportive: Offers excellent support for a broad range of body types
- Long-lasting: Premium durability for an extended mattress life
- Versatile: Used in middle / top mattress layer in foam and / or innerspring mattresses

Other Potential Uses:

- High end furniture and bedding

Raw Materials:

- Polyols: Ultracel® U-3000, Arcol® HS-200
- Isocyanate: Mondur® TD80

Digital Innovation at Covestro

We are incorporating digital technologies and processes across our entire business, from production and customer engagement to supply chain management, research and development, and new business model development. The benefits? Improved operational efficiencies, faster time to market and better insight on market and customer needs.

SlabExpert

This web-based calculation engine operates similar to an interactive Excel spreadsheet. SlabExpert reads user inputs and performs calculations to predict the properties of slabstock foam, shortening the time needed to select a starting formulation while facilitating knowledge transfer.

SlabProcessing

Without real-time tracking of foam-making conditions, a manufacturer has limited options to troubleshoot and find processing errors. Our SlabProcessing tool allows a user to monitor any sensor-controlled aspect of the slabstock foam production process to more effectively visualize, compare and manage processing performance.

CertiPUR-US® foams come with comfort and confidence

When you buy products containing certified foam, you can be confident that the flexible polyurethane foam inside meets CertiPUR-US® standards for content, emissions, and durability, and has been analyzed by independent, accredited testing laboratories.

Our polyurethane technology can create foams that pass CertiPUR-US® standards, including:

- Made without ozone depleters
- Made without PBDEs, TDCPP or TCEP ("Tris") flame retardants
- Made without mercury, lead and heavy metals
- Made without formaldehyde
- Made without phthalates regulated by the Consumer Product Safety Commission
- Low VOC (Volatile Organic Compound) emissions for indoor air quality (less than 0.5 parts per million)
- No chlorofluorocarbons (CFCs)
- Performance-tested
- Durability-tested
- Emissions-tested
- Content-tested
- Analyzed by independent, accredited testing laboratories

To learn more about certified foam, visit: http://certipur.us

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The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance, information and recommendations to determine to your own satisfaction whether our products, technical assistance and information are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by Covestro.

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This product is not designated as "Medical Grade" and therefore shall not be considered a candidate for the manufacture of a medical device or of intermediate products for medical devices, which are intended under normal use to be brought into direct contact with the patient's body (e.g., skin, body fluids or tissues, including indirect contact to blood). If the intended use of the product is for the manufacture of a medical device or of intermediate products for medical devices, Covestro LLC must be contacted in advance, in writing, to provide its agreement to sell such product for such purpose. Nonetheless, any determination as to whether a product is appropriate for use in a medical device or intermediate products for medical devices must be made solely by the purchaser of the product without relying upon any representations by Covestro LLC. For further information, please see the „Guidance on Use of Covestro Products in a Medical Application" document which can be located at www.productsafetyfirst.covestro.com.

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