



TECHNICAL BRIEF - YULEX® FOAM



Comfortable on your
body and soul

Create products with conscience

YULEX® produces two quite different types of cellular foam products: open-cell and closed-cell (CCF). While each offer unique physical properties and characteristics, both are produced from purified and refined Forest Stewardship Council (FSC) certified sources, yet each do vastly different jobs in your product. In this technical brief we look at Yulex closed-cell foam.

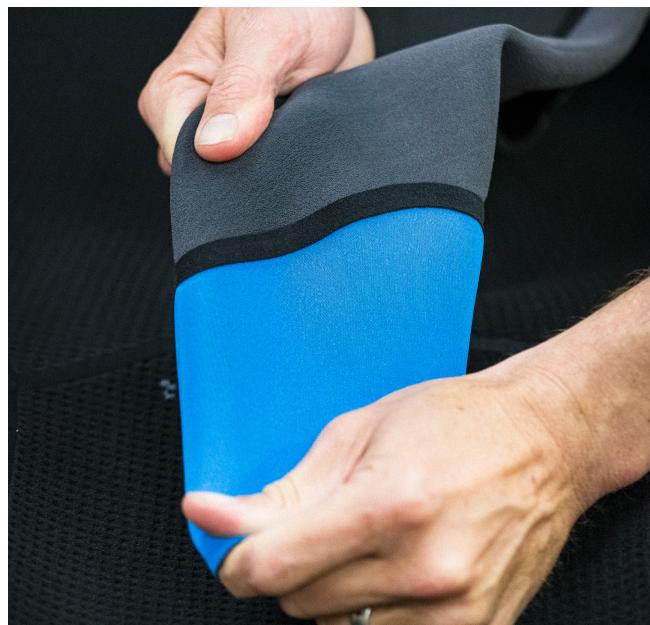
Our brand of closed-cell foam was originally developed in our laboratory to replace environmentally nasty neoprene foam used in wetsuits. Created in a partnership with Patagonia, we believed that we could produce a closed-cell foam material with all the performance qualities of neoprene but without damaging the environment or creating risks of cancer like neoprene production.

The result of our work is a foam which we offer in 4 different performance types. Yulex-CCF-550 and Yulex-CCF-350 are super stretchy and stretchy, respectively. They have low density and are great for wetsuits, diving suits, accessories like gloves, booties and hoods, and other products that require more freedom of movement. Yulex-CCF-200 and Yulex-CCF-250 are stiffer foams and often selected for use in footwear, fashion accessories like bags, electronic cases, sports medicine, and more.



Key Features:

- Unparalleled flexibility, durability, and application performance
- Cushioning, impact, and vibration absorption
- Exceptional elongation, low density and water resistance (closed-cell)
- Wide range of firmness: from extremely soft to highly firm
- Thermal control, warmth retention through air flow



YULEX® FOAM Closed-Cell Foam



Yulex closed-cell foam (also called sponge) looks like a bunch of grapes or balloons, each cell is closed off and not connected to the next. The closed balloon or grape-like cells are filled with an inert gas and act like air filled bladders (small balloons) which quickly return to shape after a compressive force. Closed-cell foams are essentially hydrophobic as the cells are closed or sealed off. Water resistance is the feature that makes it perfect for water sports, waterproof footwear and similar gear where water intrusion is unwanted.

The microscopic cell structure is produced using a specially developed blowing agent that decomposes and expands inside the rubber mixture forming micro-pockets the instant before the rubber cures, locking in the cellular structure. Yulex closed-cell foam is produced from our YULEX® PRIME Solid Natural Rubber, the only brand of plant-based natural rubber that is FSC or Program for the Endorsement of Forest Certification

(PEFC) certified, carbon neutral, biodegradable and sustainable. It is mixed and compounded with high quality ingredients which create the physical properties and performance characteristics customers demand such as:

- Low density (lightweight)
- Elongation (stretch)
- Tear strength (resistant to rips)
- Modulus (force required to stretch)
- Micro-cellular structure (millions and millions of closed-cells per cubic centimetre)
- Ozone and UV resistance (long lasting exposure to the sun)
- Flexural durability (resists cracks after thousands of movements).

The closed-cells trap air and deliver both buoyancy (easily floats) and insulation to keep you warm in cold water.

Yulex Foam is used in the same way neoprene foam products are produced using techniques such as:

- Die and kiss-cutting
- Laser cutting
- Knife, scissor or blade cutting
- Edge glueing (we always recommend water-based adhesives)
- Seam sewing and sealing

Closed-cell foam specifications for elongation, tear strength, modulus and density are typically measured without any lamination on the surfaces. This is important as the foam is seldom used without lamination, so keep this in mind when comparing physical performance properties.

It's time to evolve beyond harmful Neoprene.



There are two ways to produce traditional polychloroprene, neoprene or geoprene. Use crude oil or use limestone to produce the central polymer which is then further processed to form the finished materials that are mixed, compounded, molded under heat and pressure to form a bun of neoprene. This bun is then sliced like bread into thin sheets, laminated and ready for pattern cutting to create the end product. Neoprene derived from either petroleum or limestone are chemically equivalent. Polymerized and made into chips, limestone-based polychloroprene is not inherently stronger or more flexible than petroleum-based polychloroprene, nor does it insulate better. Any advantage one has over the other is in the different product designs, not the foam itself.

Because Yulex CCF is plant-based, or natural rubber-based, we skip the nasty mess that petroleum and limestone create along the way to becoming closed-cell



foam sheets, your wetsuit, shoes or backpack. We use natural rubber, a renewable, carbon neutral raw ingredient to make Yulex dry solid rubber, which is then mixed together, molded, sliced, laminated and ready for your next breakthrough product.

Natural rubber is renewable



FROM THE TREE

Neoprene, by nature of its high-energy production, is the most environmentally unfriendly material produced. Traditionally, all neoprene foams are limestone or petroleum based. Energy-intensive and non-renewable synthetic rubber is a significant contributor to climate change.

Yulex has created the world's first plant-based neoprene replacement, with a dramatically reduced carbon footprint to provide an environmentally-responsible alternative to traditionally produced neoprene.



Tailoring Yulex Foam

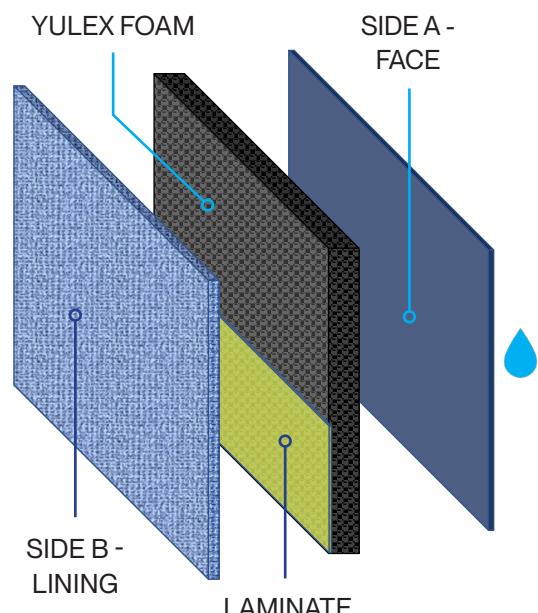


The choice of textiles plays a crucial role in highlighting the physical properties of Yulex closed-cell foam. Different types of textiles have varying degrees of stretch, abrasion resistance, and handfeel, thus selecting the appropriate fabric can enhance the performance of the Yulex foam.

For applications requiring high mobility, such as watersports, high-stretch textiles are preferred as they allow for a full range of motion without restricting movement.

On the other hand, low-stretch textiles are more suitable for accessory or low-movement applications, such as components in footwear or accessory items like bags and cases, as they provide stability and structure without unnecessary flexibility.

By mindfully considering the foam's properties and the product's intended use, the right choice of textiles can optimize the performance of Yulex foam.





Can Yulex CCF be laminated with cover fabrics?

Yes. Yulex CCF is a wonderful plant-based material that easily replaces neoprene in thousands of applications. While the foam itself is low density, stretchy and soft, its these very features that require it to be laminated at least on one side in order to protect it. Any closed-cell foam like this is easily torn and pocked and therefore must be covered with fabric or material stronger than the foam itself.

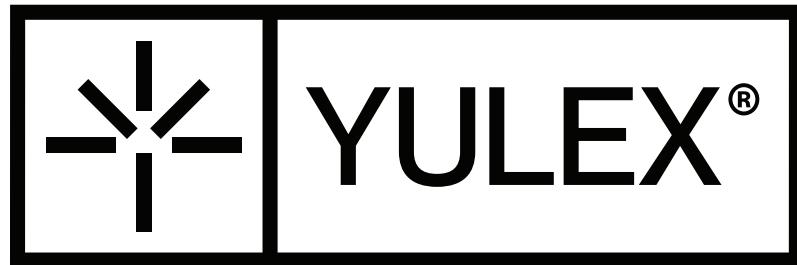
Yulex CCF is offered with a variety of different laminated fabrics on the face (side A) and/or lining (side B). We can work with you to source desired fabrics to achieve the desired aesthetic, color, or function. Contact us today to discuss your application.

Is Yulex CCF a drop-in replacement for all neoprene applications?

Yes. Yulex CCF is a direct replacement for foamed neoprene, but not a replacement for liquid neoprene used in sealants, gasketing and caulking. Active sport, footwear and other applications that do not encounter critically harsh environmental chemical conditions such as gasoline, and oils.

Neoprene production also has several additive chemicals in it that are not added to Yulex CCF, which is why Yulex CCF is far safer for humans and the environment than neoprene.

Upgrade from Neoprene to Yulex®



TO MAKE YOUR TRANSITION CONTACT

kyrrha.martin@yulex.com

10120 W Flamingo Road, Suite 4-1034 Las Vegas, NV 89417

info@yulex.com

yulex.com