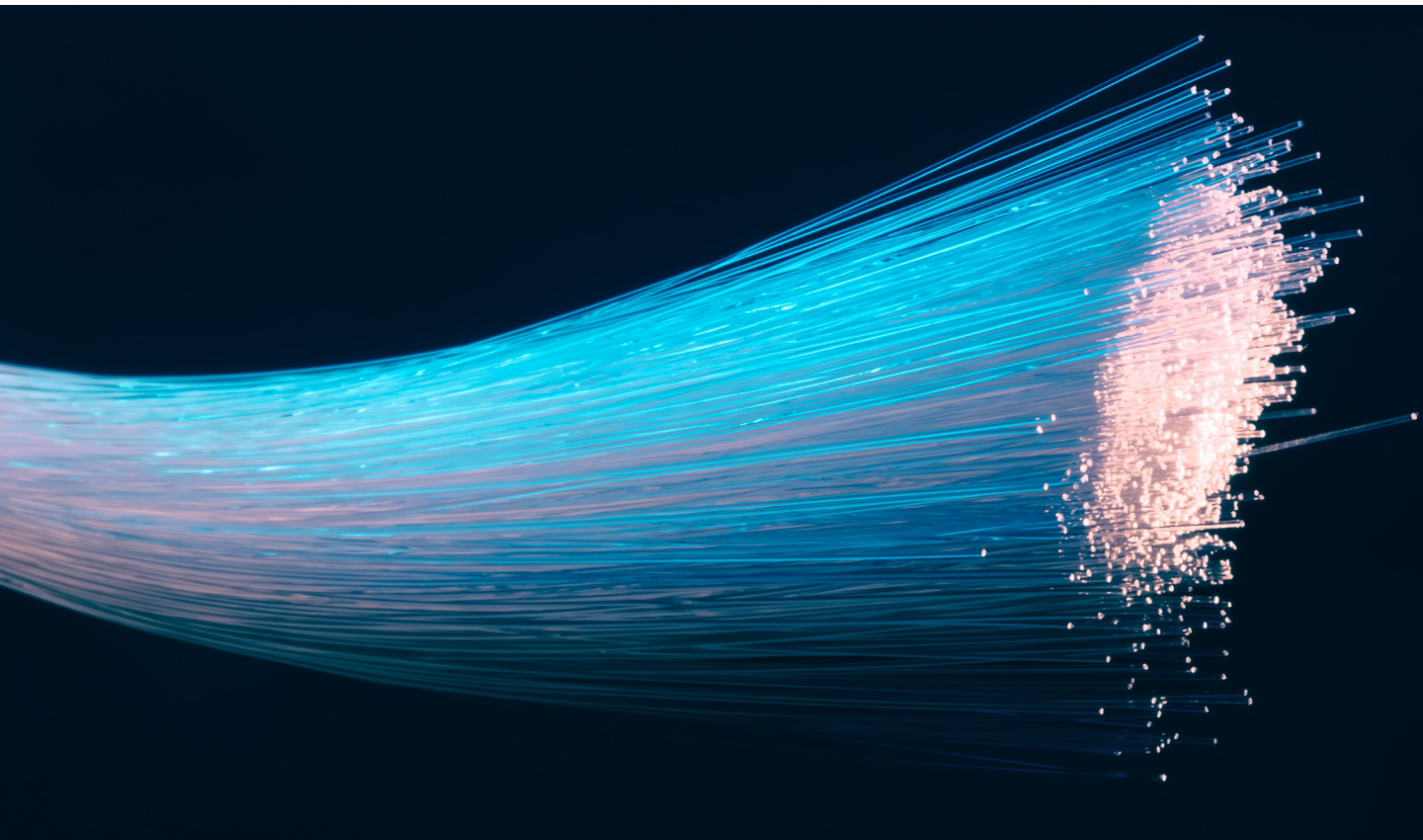


Sizing starches for glass yarns



Exploit the growing demand for glass yarns with affordable, high performance sizing starches

Ingredion's sizing starches will help you to successfully exploit the growing global demand for glass yarns. They will enable you to manufacture yarns with the performance and functionality your customers demand, whilst achieving improved productivity and affordability which can help to boost your profits. Selling directly to you through our own experienced starch specialists, Ingredion offers quality, consistency and security of supply. Ingredion sizing starches will also help eliminate synthetic alternatives and boost your green credentials.



Manufacture glass yarns at a price that's right for you and your customers

The global glass fibre market is currently growing at around 7% per annum and is expected to be worth more than US\$11 billion in 2017¹. This growth is being driven by an increasing demand in key sectors such as:

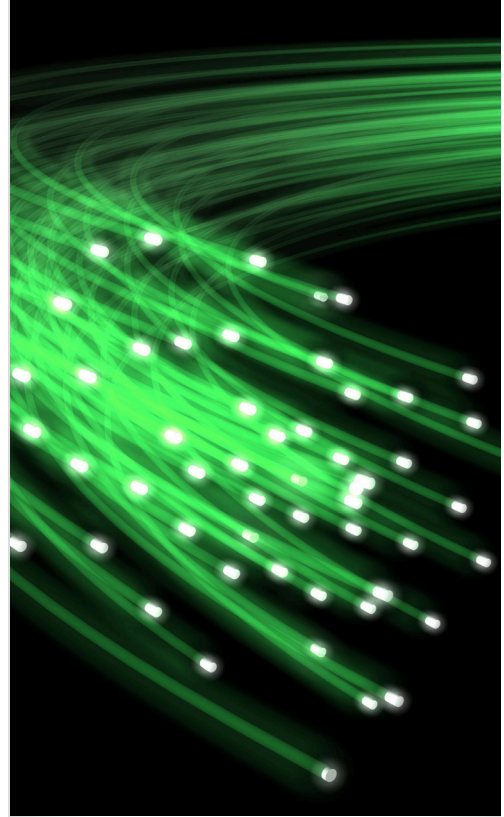
- Construction
- Electrical and electronics
- Pipe and tank
- Wind energy
- Transportation

In these sectors, glass fibre is replacing traditional materials in a range of applications as manufacturers recognise the benefits it brings in terms of weight reduction, superior performance and lower cost. However, glass fibre manufacturers face a challenge from energy costs and the price movements of inputs. Sizing is essential to the manufacturing process and choosing the correct sizing is critical because it has an impact on how the fibres behave during processing and how they perform as part of a composite.

Sizing starches from Ingredion offer quality, flexibility and cost-effectiveness, helping you to deliver the performance your customers demand at a lower cost than if you had used starch alternatives. They will allow you to optimise your glass fibre products for particular applications. Furthermore, our technical mastery of starch and unique portfolio of products will provide you with the scope to differentiate your products. In addition, when you work with our starch scientists, they can help you innovate to create completely new products.

SIZING STARCHES DIRECT FROM INGREDION **– THE STARCH EXPERTS**

Ingredion is an acknowledged global leader in advanced starch technology. We work with growers who produce maize especially for us and have developed our own proprietary high amylose starch technology.



INGREDION'S SIZING STARCHES

Ingredion offers modified and unmodified starches based on both maize and potato technology:

- The **HYLON®** range of unmodified amylose maize starch products offers excellent yarn protection, improved efficiency at the weaving machine and extremely low residue after burning.
- **CATO® 75Q** starch is a cationic starch that provide good binding onto the glass surface combined with good process stability.
- **HI-SET® 369** starch is a modified high amylose starch that offers easier cooking and flexible film formation for better yarn protection.
- **Other modified starches:** Custom-made starches to meet your specific requirements for process stability, fast setting speed, yarn protection, starch, hardness and more.

How your glass yarn production will benefit from Ingredion's sizing starches

With quality control and consistency good enough to meet the requirements of the world's toughest food authority regimes, you can rely on our sizing starches to help you create products that deliver competitive advantage time after time. In particular, companies involved in the production of glass yarn for electronic and construction applications can achieve significant benefits.

In electronic sizing applications, Ingredion products will help you to achieve the following benefits:

- Increased production speed to improve cost-efficiency
- Excellent yarn protection to improve yields
- Good film formation to prevent feathering or micro warp
- Process flexibility for fast setting speeds
- Specialty high amylose starch for fine and superfine yarn applications
- Green alternatives to polyvinyl alcohol (PVOH) for warp sizing applications
- Products for batch cook and jet cook processes

Ingredion products also deliver important benefits in construction applications, particularly for insulation, roofing, mats and scrims, these include:

- Create binders with the desired formation and functional properties
- Replace synthetic thermoset resins
- Green solutions to boost your credentials for Green Building certifications
- Excellent film formation and strength
- Modify viscosity to meet your requirements
- Maintain a stable viscosity
- Improve water or moisture resistance
- Enhance emulsion properties
- More cost-effective and easier to desize than Xylan



CONTACT US

Contact Ingredion today to discover how our sizing starches can help you produce glass yarn more reliably, flexibly and cost-effectively.

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Ingredion™

Developing ideas.
Delivering solutions.™

1. Konzept Analytics, (2013). Global Fiber Glass Market Report - 2013 Edition. Research and Markets.

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