Henkel

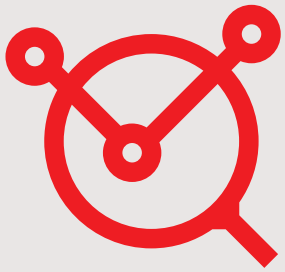
LOCTITE®

CASE STUDY

Non-Isocyanate Potting Adhesive for Hollow Fiber Filters. A Safer, Faster, Customizable Alternative.

Market Situation

- Water filtration and separation are requirements in many industries for numerous applications. These include food and beverage, wastewater treatment, and desalination, among others. The importance of water purification will only escalate as water scarcity becomes increasingly problematic in several regions, making resource maximization essential.
- One of the most prevalent filters for liquid filtration is the hollow fiber filter, where thousands of hollow fibers separate water into two flow streams. Adhesive materials are a critical component of the filter assembly.
- Potting adhesives secure the fiber membranes into the housing, allowing for proper filter function, reliability, durability, and longevity. However, the application process can be time-consuming, and current adhesives can't bridge the gap between health and safety, manufacturing speed, and robust assembly.



Application Challenges

- Traditional manufacturing methods generally employ polyurethane- or epoxy-based adhesives for hollow fiber potting. Each chemistry platform – while functionally sound once cured – has challenges.
- Two-part polyurethane materials incorporate an isocyanate hardener component, which requires specialized handling procedures and introduces safety risks. Furthermore, polyurethanes are incompatible with wet fibers so, even though adhesive cure is fast, lengthy fiber drying time limits assembly rates. Epoxy-based adhesives, which are compatible with wet fibers, typically have slow cure rates and high exotherm, dramatically restricting production speed and output.
- To effectively balance safety, processing, and application robustness, a material solution that can harmonize production throughput, membrane compatibility, static or centrifugal processes, and filter performance is required. Manufacturing adaptability within a high-volume environment is essential to meet current and future water conservation and reuse demands.

Groundbreaking Solution

Henkel has developed a novel potting adhesive platform that effectively addresses the challenges with conventional polyurethane and epoxy materials used for hollow fiber filter potting.

LOCTITE® NEO is a non-isocyanate adhesive that prioritizes health and safety while enabling mass production, filter reliability, and cost-effectiveness.

LOCTITE NEO offers hollow fiber filter designers and manufacturers a material that:

- Provides compatibility with various materials, applications, and membrane types – whether wet or dry.
- Has optimized viscosity to enable superior membrane penetration while not blocking fibers.
- Cures very quickly at room temperature with controlled exotherm, reducing centrifuge time from hours to minutes.
- Can withstand permanent water and pressure exposure and is resistant to chemicals.
- Provides excellent compatibility with automated, high-volume filter production processes.
- Helps reduce production costs through exceptional manufacturing efficiency and throughput gains.
- Can be customized and tuned to specific application requirements, enabling design flexibility and innovation.
- Requires no special storage and has a two-year shelf life.

Game-Changer for Hollow Fiber Filter Production

LOCTITE NEO is already a game-changer for hollow fiber filter production. Employed by leading filter manufacturers, LOCTITE NEO has helped improve output, reduce overall manufacturing costs, and simplify the supply chain through compatibility with multiple filter designs.

Filtration is the first of many opportunities for LOCTITE NEO. As the first isocyanate-free polyurethane alternative, the chemistry platform holds infinite application possibilities.

Want to learn more about LOCTITE NEO?

Get in touch with our technical experts by emailing ***filtration@henkel.com***.

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