ENGINEERED MEDIA & COMPONENTS

For Cooling Tower Applications

BRENTWOOD®

WHY BRENTWOOD

Unparalleled Support

At Brentwood, we view ourselves as an extension of your team. We're a manufacturer that can provide a product, but our goal is to be much more than that by offering application engineering support, project planning services, and developing new products that take tower performance to the next level.

Our team recognizes that each customer is different, and our representatives make every effort to tailor their approaches so they can best meet your specific needs – while also ensuring the right products make it to your site at the right time.

As a complement to our customer service and sales teams, Brentwood has a staff of engineers available 24/7 to provide application support. Our engineering staff helps customers to evaluate tower capability via our S.T.A.R. (Software for Tower Analysis & Rating) Program, provides training sessions, and makes site visits to ensure all parts are operating efficiently.

Dedication to Quality & Sustainability

Brentwood is committed to delivering products that meet or exceed customer expectations. We utilize ISO quality management systems to ensure each part is manufactured precisely and consistently.

We are also dedicated to conducting business in a manner that is compatible with both the environment and the communities in which we operate. To this end, Brentwood maintains programs to prevent pollution and to protect the environment, the health of our employees, our customers, and the surrounding communities.

Our employees aim to minimize Brentwood's environmental footprint by:

1. Participating heavily in plastics recycling. In fact, Brentwood's facility in Lebanon, PA, is dedicated to this specific purpose and recycles millions of pounds of plastic annually.

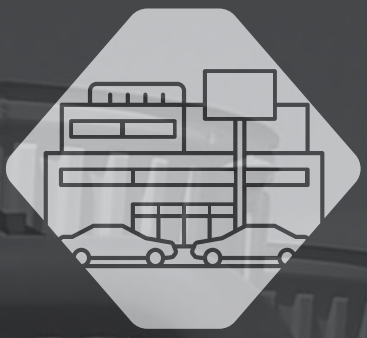
2. Leading the cooling tower industry in product lifetime, reducing the need for continuous reproduction of our products.

3. Finding innovative ways to assemble our products without the use of "glue", limiting the amount of volatile organic compounds (VOCs) released into the air.

> Their technical support, reputation, and documentation is second to none. That is super important for global customers.

INDUSTRIES SERVED

Power Generation



Commercial HVAC

General Manufacturing/Industrial

Chemical Refining

ENGINEERED SOLUTIONS

Brentwood understands the power of testing and research & development (R&D). We invest heavily in these core areas of our business so that we can develop new products and improve existing ones. Our intent in doing so is not only to supply high-performing fills but also to provide peace of mind for our customers, knowing that Brentwood products yield long-lasting, trouble-free service.

Our headquarters in Reading, PA, houses our state-of-the-art R&D lab. The lab is fully staffed by engineers and scientists, and it contains a variety of equipment needed to evaluate cooling tower components.

Thermal Performance

The most essential pieces of equipment in the R&D lab are Brentwood's counterflow and crossflow thermal test rigs. These are designed to quantify fill performance at a full range of air speeds and water loadings. The rigs are computer-controlled with calibrated instrumentation for fast and accurate data acquisition. After thorough testing, Brentwood passes that performance data on to you to ensure that our fill products always meet advertised performance.

Additional Performance Testing

In addition to thermal tests, the R&D center has the capacity to evaluate a multitude of other important fill characteristics. We utilize custom equipment that is designed and constructed to measure the fouling propensity of fills, water hold-up weight, and deflection under high temperature, to name a few.

Material Evaluation

Brentwood performs material tests before the products are manufactured to ensure high quality. We use differential scanning calorimetry and thermogravimetric analysis instruments to monitor resin from outside suppliers, ensuring our vendors are meeting our material specifications. Additionally, many of our facilities are equipped to test essential properties like tensile strength, flexural modulus, heat deflection temperature, impact strength, and flammability.

New Product Development

Our dedicated R&D team is continuously developing new fills with increased performance and fouling resistance. Our engineers can go from a concept to a physical prototype that is ready to test in a matter of days, allowing Brentwood to rapidly test and iteratively design new products. By using powerful Computational Fluid Dynamics (CFD) software to complete an initial evaluation of fill features, we're able to determine if a fill looks favorable and print a mold in our large-format 3D printer. The prototype is then thermoformed, assembled, and conditioned for testing.

> They are very supportive... They are more of a partner than a vendor.

MECHANICAL ASSEMBLY

Brentwood's patented Mechanical Assembly (MA) technology allows fill and drift eliminator packs to be permanently assembled without glue by crimping the male and female attachment tabs molded into the individual sheets. This innovative attachment process produces packs that are exceptionally strong, environmentally friendly, cost-effective, and easily assembled on site.

Strength

Each mechanically assembled pair of sheets is, in effect, a small pack with a very high beam strength, proportional to its depth. When the pairs are edge-bonded, the resulting pack can support up to 10 times more than the average fill load (the weight of the fill plus the weight of the water).

Environmental Considerations

In recent years, American industries have made great strides in reducing air pollution, particularly the byproducts of industrial manufacturing applications known as volatile organic compounds (VOCs). Brentwood's MA process reduces the amount of VOCs emitted by eliminating the use of glue altogether, and therein, successfully addresses both the Clean Air Act and OSHA's Hazard Communication regulation.

Economy & Efficiency

There are no glue or labor costs associated with Brentwood's mechanically assembled products, so all savings are passed on to the customer. Shipping costs are also reduced because flat sheets are far less expensive to ship than assembled packs.

Ease of Assembly

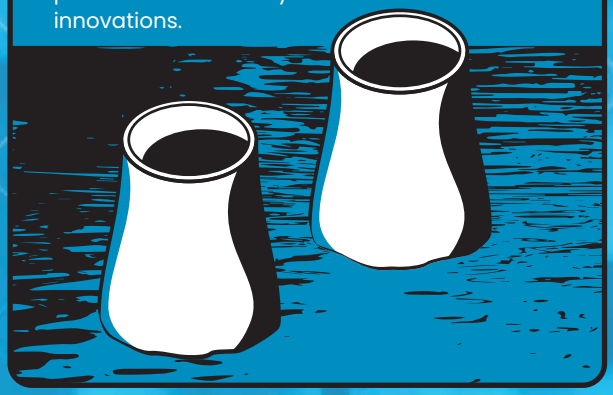
The MA process is just as fast as other methods using adhesives or solvents. The process also eliminates double handling because packs can be installed immediately after being assembled. Brentwood's MA equipment is simple to set up on site, easy to use, and available on a per-project basis to increase customer savings.

PROCESS VIDEO:

Scan the QR code using your phone's camera to see how the MA process works

A FLOOD OF IDEAS

Brentwood unintentionally entered the cooling tower industry in 1973, after Hurricane Agnes flooded much of the mid-Atlantic. The storm prompted a leading cooling tower manufacturer to contact Brentwood, requesting a temporary relocation of their machinery to our facility while they worked to repair water damage. We agreed to help and quickly noticed many of their products were rusted over. We questioned why steel was being used for cooling water applications, which led us to create the first plastic alternative. This spurred decades of development, resulting in countless Brentwood cooling tower products and industry innovations.



15 MILLION POUNDS PER YEAR

AMOUNT OF REPROCESSED SCRAP MATERIAL RECYCLED AT OUR LEBANON, PA FACILITY

BRENTWOOD'S DATABASE OF FACTORY-ASSEMBLED TOWERS INCLUDES OVER 6,800 COUNTERFLOW MODELS AND 950 CROSSFLOW MODELS.

WE LEVERAGE THAT DATA TO HELP YOU WIN PROJECTS DAILY!

OVER 2K

NUMBER OF STAR RATINGS COMPLETED

1973
Brentwood works with a major cooling tower OEM to produce the world's first plastic drift eliminators.

1980
Brentwood produces 3 drift eliminator models, the company's first proprietary products.

1983
CF750, Brentwood's first film fill, is developed and soon after replaced by CF1900, a stronger product with a perfect honeycomb pattern.

1993
A new industry standard is set for anti-fouling media with Brentwood's introduction of the first vertical-fluted fill.

1996
Brentwood purchases Munters Corporation's cooling tower and wastewater product lines.

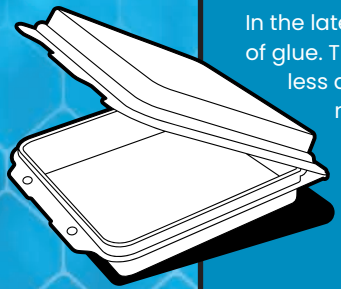
2000
Mechanical Assembly method is developed, giving us the ability to automate our manufacturing process.

2002
OF21MA is developed to close the gap between high-efficiency and low-fouling fills. It remains our most popular product to date.

2004
Brentwood produces its first fill for crossflow tower applications, called XF75.

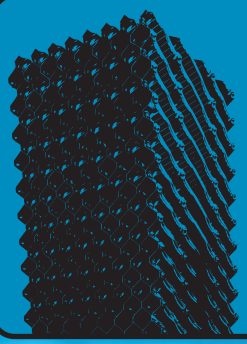
THE ORIGIN OF MECHANICAL ASSEMBLY

In the late 1990s, Brentwood set out to develop an assembly method that would eliminate the use of glue. The goal was to develop a process that would be less time-consuming, less costly, and less damaging to the environment. One day, a meeting took place over lunch and someone noticed a clamshell sandwich container that gave them an inspired idea: By using a series of corresponding cones and attachment tabs, the sheets could be crimped together to form strong packs. This was the magical moment where all the pieces came together – literally – to create Mechanical Assembly technology.



71 COUNTRIES

BRENTWOOD HAS SUPPLIED COOLING TOWER PRODUCTS ACROSS THE GLOBE, INCLUDING EVERY STATE AND PROVINCE IN NORTH AMERICA



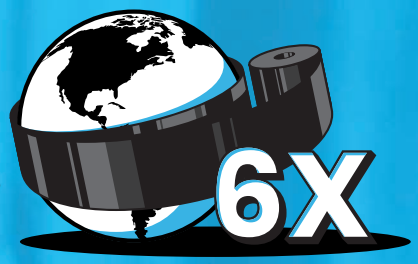
FASHIONABLE FILL

One of Brentwood's customers repacked a tower on the roof of Saks Fifth Avenue in New York City (yep, in downtown Manhattan on Fifth Ave!). They had fill leftover from the repack so they stored it for later use, and the man in charge of the Saks window display happened upon it and thought it looked modern. So, believe it or not, Saks incorporated Brentwood fill into their display, with some packs standing up tall and others lying down with clothing displayed on them.

150 MILLION

CUBIC FEET OF PRODUCT SUPPLIED GLOBALLY

THAT'S ENOUGH MEDIA TO WRAP AROUND EARTH 6 TIMES



2 MILLION

THE CUBIC FEET OF MEDIA INSTALLED IN OUR LARGEST PROJECT

THAT'S ENOUGH MEDIA TO FILL 10 GOODYEAR BLIMPS

200

COMBINED NUMBER OF YEARS BRENTWOOD EMPLOYESS HAVE IN COOLING TOWER KNOWLEDGE AND EXPERIENCE

2008
The S.T.A.R. Program, a custom Brentwood software, is created to provide customers with a tool for rating their own towers.

2010
HTP25, Brentwood's first injection molded fill, is developed to bridge the gap between film and splash fills.

2017
The CFUltra drift eliminator is released, offering an improvement of 20-50% over industry-standard drift ratings.

2021
Brentwood introduces a Separator System, designed to extend the lifetime of other tower products and make the end user's job easier.

2008
AccuShield technology is introduced to combat fouling by slowing the growth of microorganisms.

2014
Brentwood builds a custom fill fouling rig for cooling tower testing.

2018
A dedicated product development team is formed, spurring a wave of new products: ThermaCross, ShockWave, XF75Pro, HTP20, and SpiraBar.

2022
Brentwood acquires Enexio Water Technologies, enabling global growth through new competencies and areas of expertise.

ON AVERAGE, ONCE EVERY

48:00 HRS

A COOLING TOWER SOMEWHERE IN THE WORLD IS BEING REPACKED USING A PAIR OF BRENTWOOD XF FILL SUPPORTS

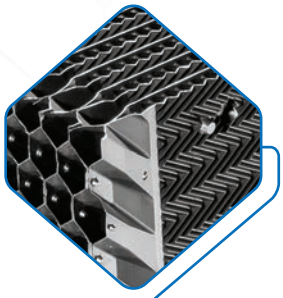
MA TECHNOLOGY HAS BEEN USED IN

50+ COUNTRIES

GLOBALLY

COOLING TOWER COMPONENTS

Brentwood focuses solely on what's inside your tower. We know your process is paramount, so you need optimized cooling tower products and components to support it. By offering the most complete line of internal polymer components in the industry, namely fills and drift eliminators, Brentwood works with you to ensure you receive the best-suited products for your project and application.

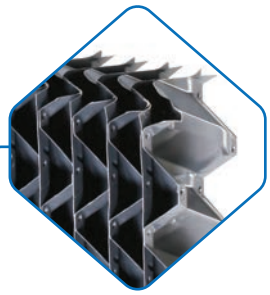


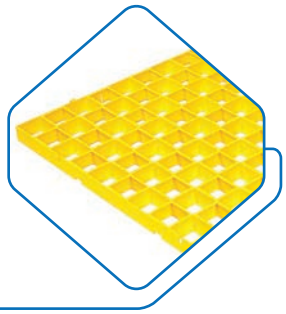
Crossflow Film Fill

Bottom-supported fills designed specifically for crossflow towers have an engineered surface that evenly distributes water over the entire fill area for high thermal performance.

Crossflow Drift Eliminators

Optimized for crossflow towers, the upward flow path and steep drainage angle ensure the best drift removal efficiency.



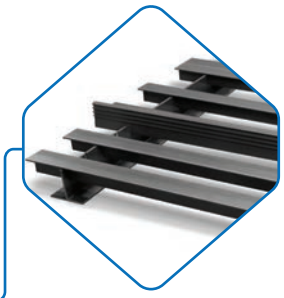


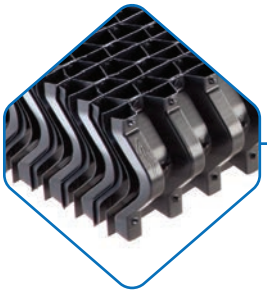
AccuGrid®

AccuGrid panels are used as intermediate support layers in crossflow applications and provide a durable top layer of media protection in counterflow installations.

Supports

Brentwood's cooling tower fill and drift eliminator support systems are engineered to provide adequate support while allowing maximum air and water flow.



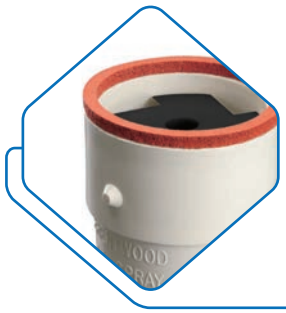


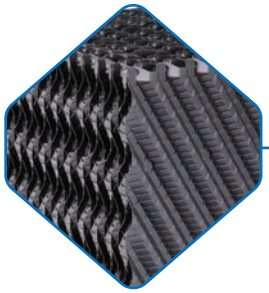
Counterflow Drift Eliminators

Designed to achieve maximum drift removal, counterflow drift eliminators have significantly lower pressure drop than dual-purpose drift eliminators.

Nozzles

The DekSpray™ Nozzle is a corrosion-resistant, versatile nozzle system that offers multiple turbulator and orifice options to provide optimal distribution over a wide range of water loadings.



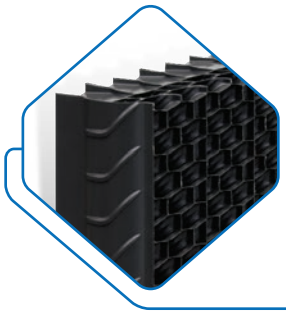


Counterflow Film Fill

Brentwood offers the most complete line of film fills to fit any water requirements, from high-efficiency, cross-fluted to fouling-resistant, vertical-fluted designs.

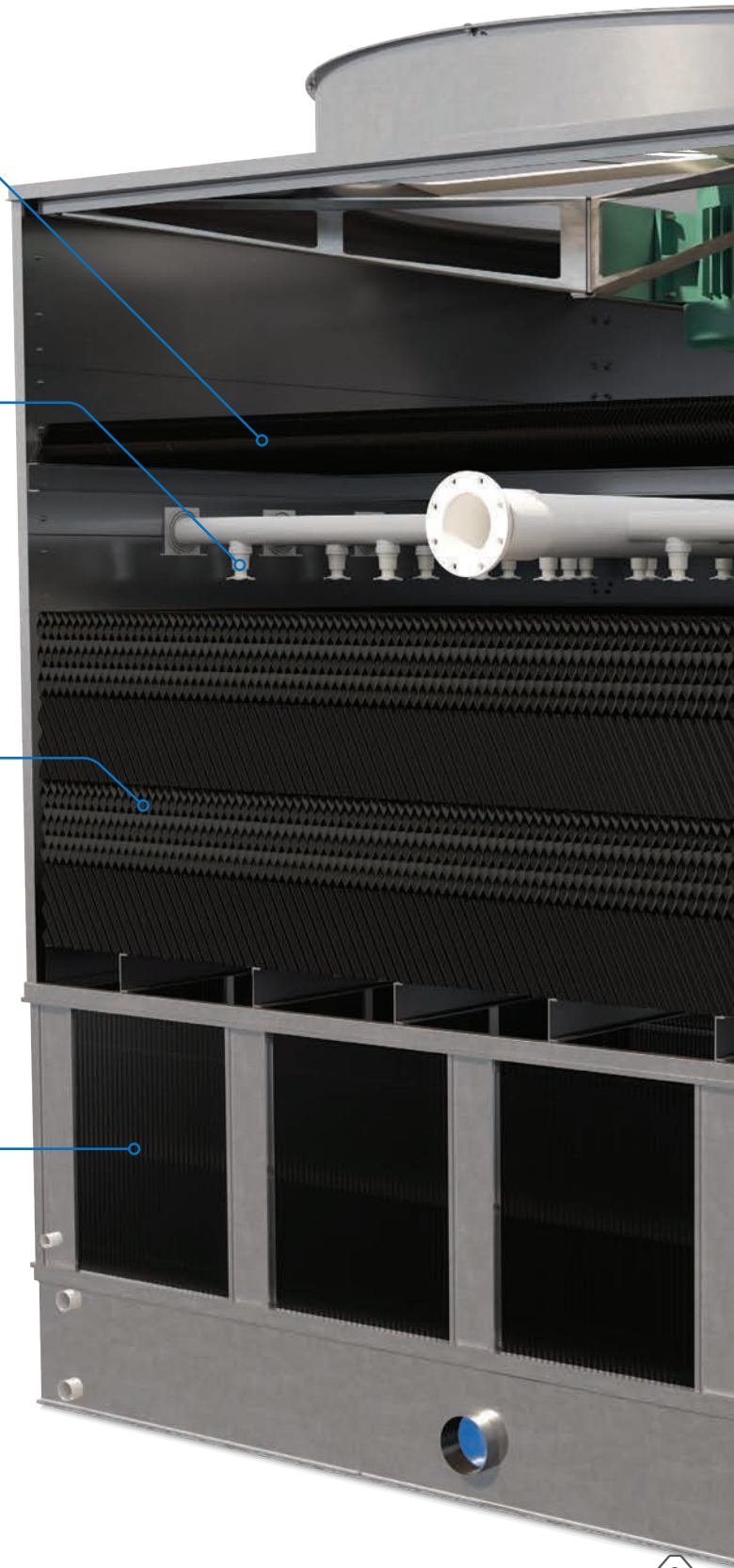
Inlet Louvers

Inlet louvers improve air flow into the cooling tower, keep out debris, eliminate water splash-out, restrict sunlight, reduce noise, and improve tower appearance.



Stainless Steel Media

Fill, drift, and inlet louvers can be offered in stainless steel material for non-combustible and high-temperature applications.



MEDIA TYPES & APPLICATIONS

Cooling media maximizes evaporation so waste heat can be dissipated before water is discharged or recirculated for reuse. Additional tower components, like drift eliminators and inlet louvers, complement cooling media for efficient tower operation.

HVAC/Clean Water Quality

When clean, potable water is in use, film fills with the highest possible thermal performance can be utilized. Brentwood offers products with high surface area and high water holding to maximize available heat dissipation. This allows for small tower footprint and less energy consumption in fan horsepower.

Cross-Fluted Fill

Cross-fluted designs provide high thermal performance and have alternating fill sheets, allowing for excellent lateral water dispersion. High thermal performance is achieved by utilizing the engineered microstructure design.

Herringbone Fill

Herringbone fills take advantage of an engineered surface design to distribute water evenly over the entire fill area for high thermal performance. These fills are designed to replace OEM hanging fill sheets in crossflow cooling towers serving HVAC, light industrial, and other process cooling requirements.

Poor Water Quality

When water is being taken from surface waters such as lakes and rivers, or the water is likely to have occasional increases in solids and biological activity, Brentwood has designed several products that provide greatly increased resistance from fouling and clogging, while maintaining a high level of thermal performance.

Offset-Fluted Fill

Offset-fluted fills utilize the water dispersion feature of cross-fluted fills, while the majority of the water film travels in a vertical path (like vertical-fluted fills). This keeps the water-film velocity high and reduces fouling potential. By combining these characteristics, offset-fluted fills are able to achieve high thermal performance and low pressure drop.

Vertical-Fluted Fill

Vertical-fluted fills are designed to direct the water in a vertical path, and large flute openings produce the high water velocities necessary to create an anti-fouling environment.

Hybrid-Fluted Fill

Hybrid-fluted fills are a thermally engineered advancement to standard vertical-fluted products with the performance of high- efficiency fills. Their design features promote mixing of the air as it moves through the pack, maximizing evaporative heat transfer and exceeding the performance of cross-fluted fills, while incorporating the fouling resistance of vertical-fluted products.

Trickle Fill

Trickle fills generate thin films of trickling water to maximize cooling in poor-water-quality applications. The advanced flute geometry of these products allows for trickling of water along the structural members to increase thermal performance.

Industrial Process

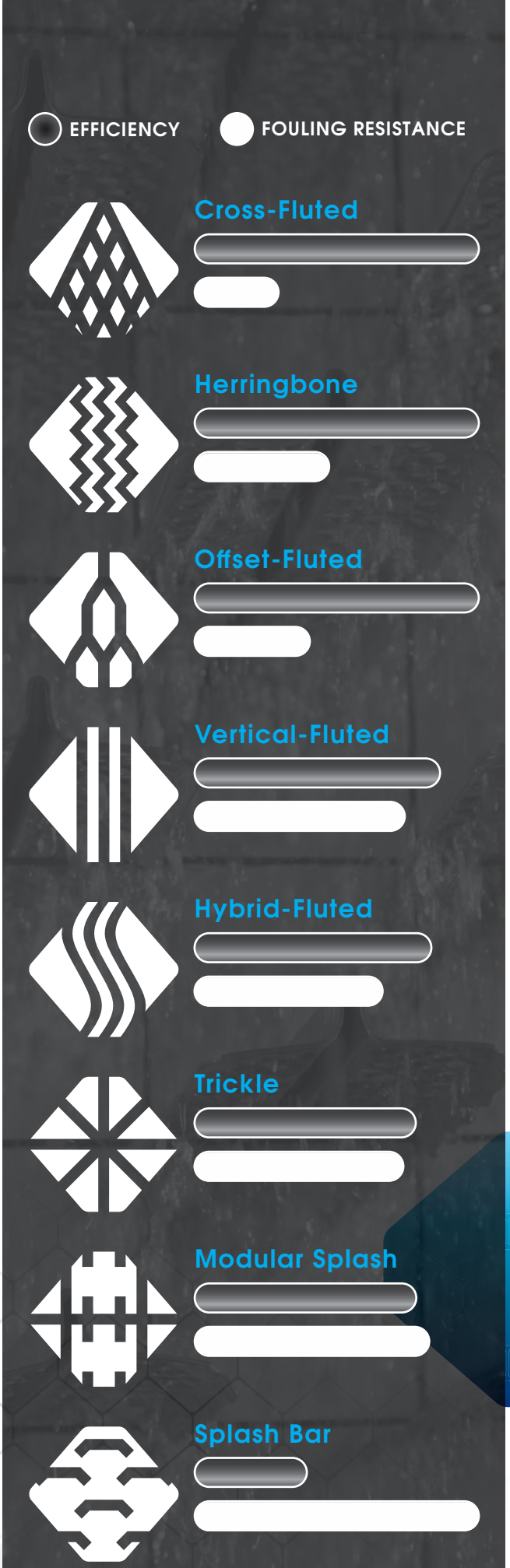
For the dirtiest environments and most demanding applications, fill products with exceptional fouling resistance are paramount in maintaining optimum cooling tower performance. Brentwood manufactures several different types of fill products with high fouling resistance. The vast array of options in this category allows the selection of fill that can be optimized for your specific cooling tower, process contaminants, and water quality.

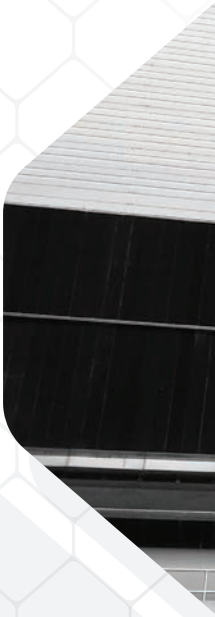
Modular Splash Fill

Modular splash fills are designed to be installed in both counterflow and crossflow towers where high thermal performance is required but poor water quality does not permit the use of film fills. The open, fouling-resistant design of these fills is ideal for applications where the circulating water has very high levels of suspended solids.

Splash Bar Fill

Splash bar fills break the water into droplets, continually exposing the greatest amount of water surface to the cooling air. Bar splash fills are designed for cooling of power plant, petrochemical, HVAC and other processes.





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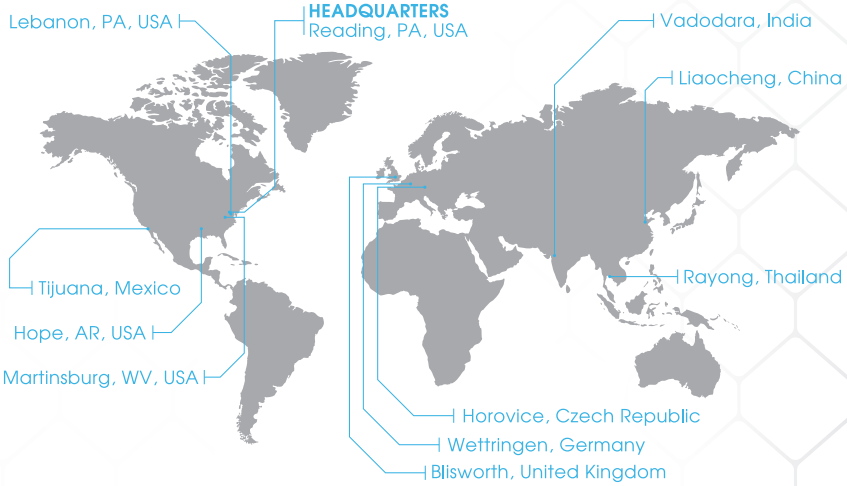

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