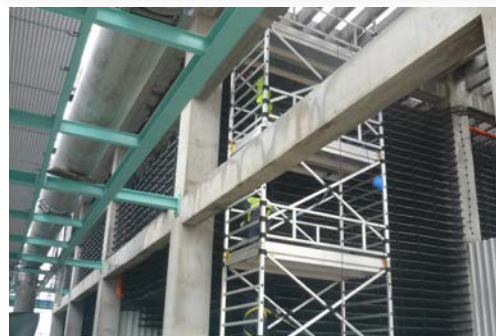
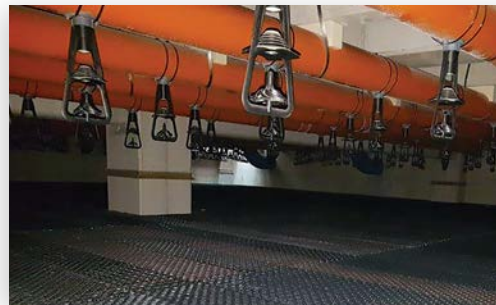


SPIG™ Wet Cooling Tower Products and Replacement Parts

Proven for reliability and performance



RENEWABLE | ENVIRONMENTAL | THERMAL

SPIG™ Wet Cooling Tower Products and Replacement



As a leading worldwide supplier of SPIG™ cooling system solutions, Babcock & Wilcox (B&W) provides comprehensive after-sales services including operational support, maintenance, training, upgrades and replacement parts. Our replacement components for wet cooling towers are reliable and proven to keep your equipment operating at optimum efficiency levels, regardless of original manufacturer. Quality components are available for quick delivery from a worldwide network of service locations to provide you with continuous and safe plant operation.

Research & Development and Engineering

All SPIG products and replacement parts are tested at our state-of-the-art cooling tower cell test chamber located at our headquarters in Paruzzaro, Italy. At this specialized technology center, a dedicated team of experienced R&D engineers conduct thermal performance research on fill components and nozzles, drift eliminator efficiency testing, noise tests on a variety of components, nozzle efficiency testing, and multi-row bundle testing, among many other tests. These activities are aimed to improve product quality, performance and dependability.



Distribution Nozzles

WATER DISTRIBUTION ACCESSORIES

Effectively designed distribution nozzles help ensure a uniform delivery of water over the fill. Uniform water distribution at the top of the fill is essential to achieve proper wetting of the entire fill surface. Nozzles can either be fixed in place while spraying in a round or square pattern, or they can be part of a rotating assembly as found in some circular cross-section towers.

SPIG ECOJET and NEW STATIC distribution nozzles from B&W have been developed after successful performance test results.



Distribution nozzle design and development

All the nozzles provided by B&W are designed, developed and tested at our test chamber and laboratories in Arona, Italy. After software modeling, the nozzles are produced for sample test campaigns.

To achieve optimal water distribution on the fill pack at various water flow rates, extensive tests are conducted, including discharge coefficients, reduced loss-of-pressure, and wear tests. Additional tests are conducted on pilot plants to provide further design data. As the heart of the thermal exchange process, the fill pack relies on the efficiency achieved with effectively designed distribution nozzles.

Our ECOJET and NEW STATIC distribution nozzles provide versatility, high reliability and outstanding performance, and can be manufactured with V2 as per UL-94 standards for self-extinguishing properties.



ECOJET S

NEW STATIC



ECOJET L

Technical Data	ECOJET S	ECOJET L	NEW STATIC
Material	PP	PP	PP
Diameter range (mm)	20 – 30	32 – 40	16 – 40
Operating water head (bar-g)	0.03 – 0.3	0.03 – 0.3	0.03 – 0.3
Water distribution	Static cone and shaped plate, impellers (plus and 3 helix)		Static
Application	Pressure and gravity distribution system		
Pipe/flume connection	PP adaptor ring		
Weight (g)	220	300	120
Height (mm)	285	325	190

Film Fill

SPIG wet cooling system film fill turns water droplets produced by distribution nozzles into a thin film for highly efficient cooling by producing a large area for effective heat transfer and evaporation.

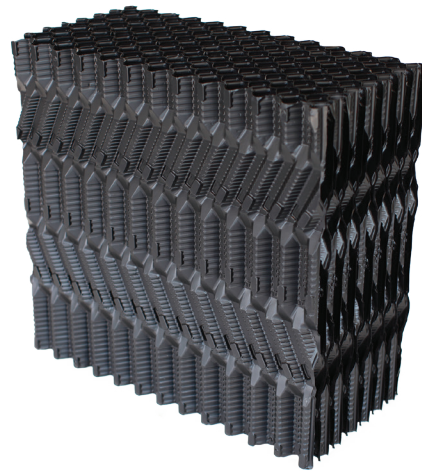
SPIG state-of-the-art film fill components are designed and tested at our innovative test chamber and laboratories. Research and development engineers conduct thermal performance tests on splash and film fills and drift eliminator tests in our research center in Italy.

For optimal thermal performance and long operating life, the fill components should be properly selected, based on the fundamental parameters of the circulating water such as total suspended solids (TSS), water chemistry, cycles of concentration, and the presence of contaminants. The use of high-quality materials can help extend the lifetime of the cooling tower and reduce the frequency of component replacement.

In applications with particularly dirty process water, our SPIG LC fill type was developed to achieve the best compromise between high-thermal performance and water containing higher amounts of contaminants.



X12 | X20

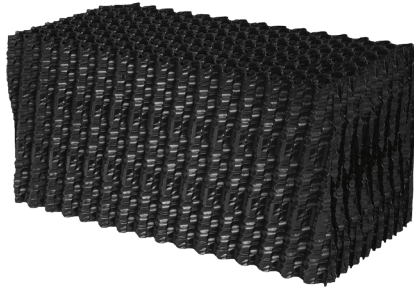


Y20

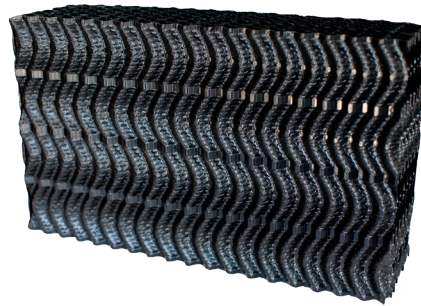
Technical Data

	X12	X20	Y20
Material	PVC/PP	PVC/PP	PVC/PP
Width of channel (mm)	12	19/20	20/21
Slope of channel (°)	30	30	0/25
Thickness of material (µm)	260 – 380	280/400	300/500
Specific area (m ² /m ³)	240	150	148
Standard block dimension L x W x H (mm)	up to 2400 x 300 x 150/300/600		
Connection of film sheet to blocks	Gluing/Welding		

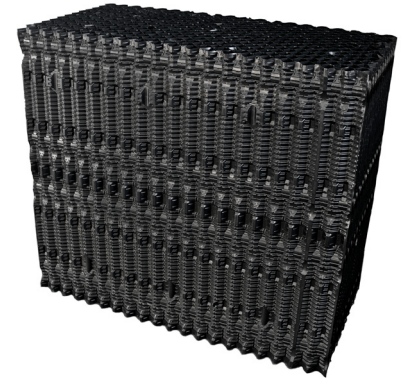
Film Fill



LC 25 | LC40



TGR20



LNR20

Technical Data

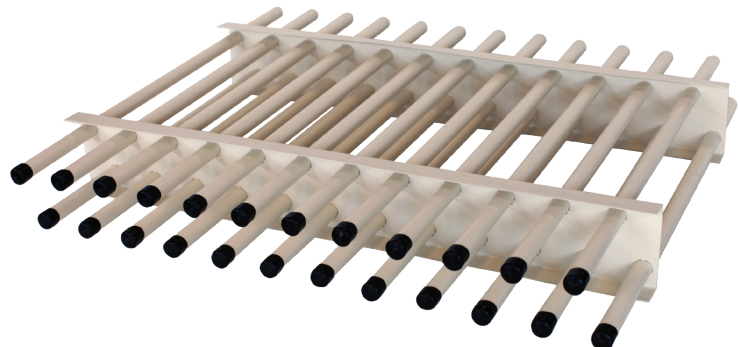
	LC25	LC40	TGR20	LNR20
Material	PVC	PVC	PVC	PVC
Width of channel (mm)	25	37	20	20
Slope of channel (°)	~10	10	0/25	0
Thickness of material (µm)	380/500	420/500	300/500	300/500
Specific area (m ² /m ³)	112	86	142	135
Standard block dimension L x W x H (mm)	up to 3000 x 600 x 300/600			
Connection of film sheet to blocks	Gluing			

Notes:

1. Standard temperature range is -20C to 55C for PVC and -20C to 70C for PP.
2. Minimum temperatures as low as -40C can be achieved with special additives in the raw material.
3. Maximum temperatures as high as 70C for PVC or 80C for PP can be achieved with special additives in the raw material.
4. PP can be provided with fire-retardant properties as per ASTM E84 FI<25 or in accordance with CTI 136 Code.

Film Fill Protection Device

Our film fill protection device is designed to protect against damage to spray nozzles and the film fill upper layer in applications where water contains high levels of contaminants such as sand or debris. This device is composed of PVC-extruded pipes and PP spacers to be assembled onsite, and positioned on the upper surface of film fill. It is available in varying lengths to fit into any cooling tower dimension.

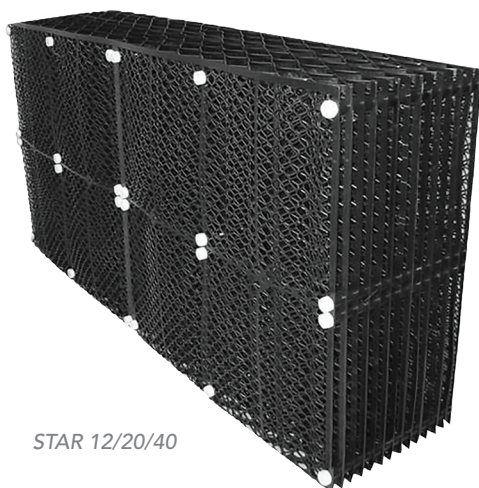


Splash Fill

B&W provides a wide range of SPIG splash fill components. The fill material facilitates heat transfer capability by maximizing water/air contact. Cooling towers employ plastic (PVC or PP) materials for fill, with fire-retardant properties, according to ASTM E84.

Splash fill water falls over successive layers of horizontal splash bars, continuously breaking into smaller droplets, while also wetting the fill surface.

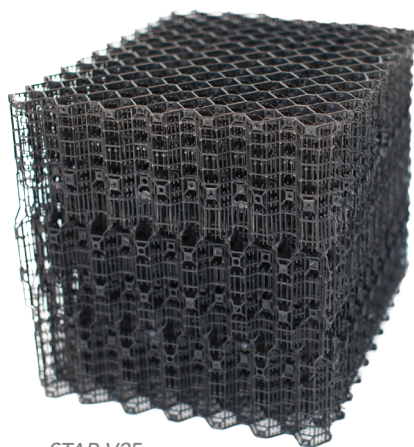
The wide range of SPIG splash fill components has been developed based on extensive field experience, particularly with water which is prone to clogging, such as sea and geothermal water.



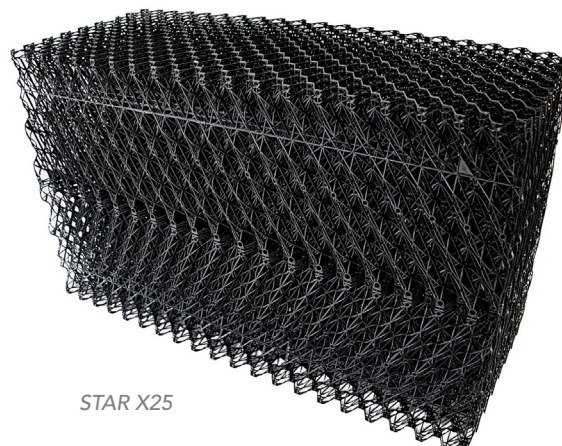
STAR 12/20/40



STAR X20



STAR V25

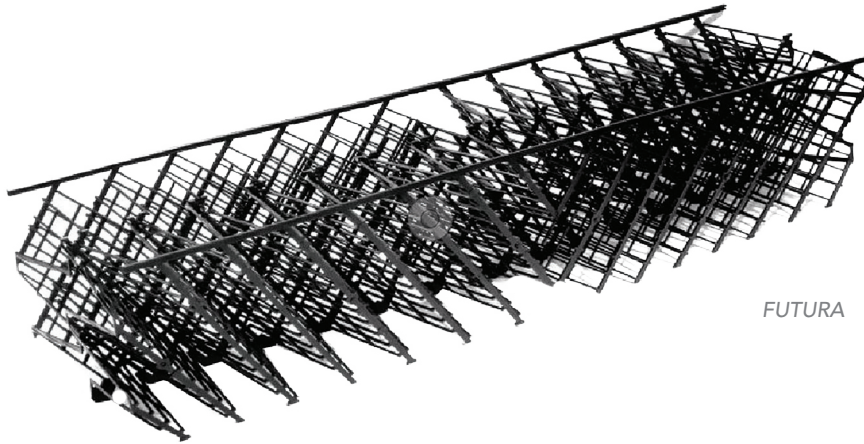


STAR X25

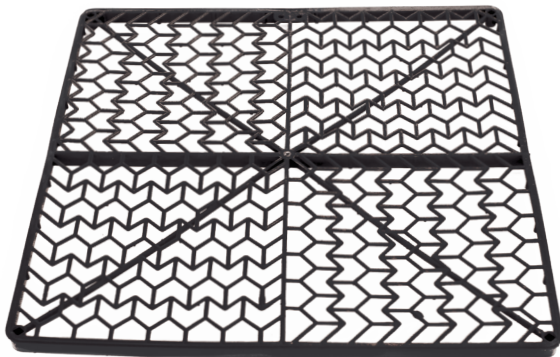
Technical Data

	STAR 12/20/40	STAR X20	STAR V25	STAR X25
Material	PP	PP	PP	PP
Standard dimensions L x W x H (mm)	1200 x 307 x 600	910 x 600 x 450	910 x 600 x 450	1000 x 500 x 600
Unit dry weight (kg each)	14/11/8	5.5	6.3	3.1
Assembly connections	PP Connectors and tie rods	Clips/PP Tie rods	Clips/PP Tie rods	Clips/PP Tie rods

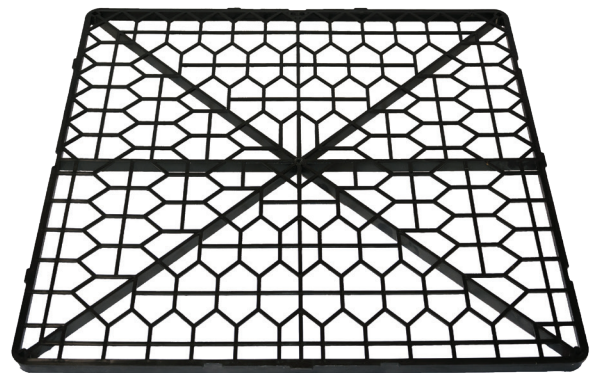
Splash Fill



FUTURA



HP 600



HEXA 667

Technical Data

	FUTURA	HP 600 / HEXA 667	
Material	PP	PP	
Standard dimensions L x W x H (mm)	1200 x 300 x 300	600 x 600 x 22	667 x 667 x 22
Unit dry weight (kg each)	2.2	0.51	0.6
Assembly connections	Clips	Wire/Support/Spacer	

Notes:

1. Standard temperature range is -20C to 55C for PVC and -20C to 70C for PP.
2. Minimum temperatures as low as -40C can be achieved with special additives in the raw material.
3. Maximum temperatures as high as 70C for PVC or 80C for PP can be achieved with special additives in the raw material.
4. PP can be provided with fire-retardant properties as per ASTM E84 FI<25 or in accordance with CTI 136 Code.

Drift Eliminators

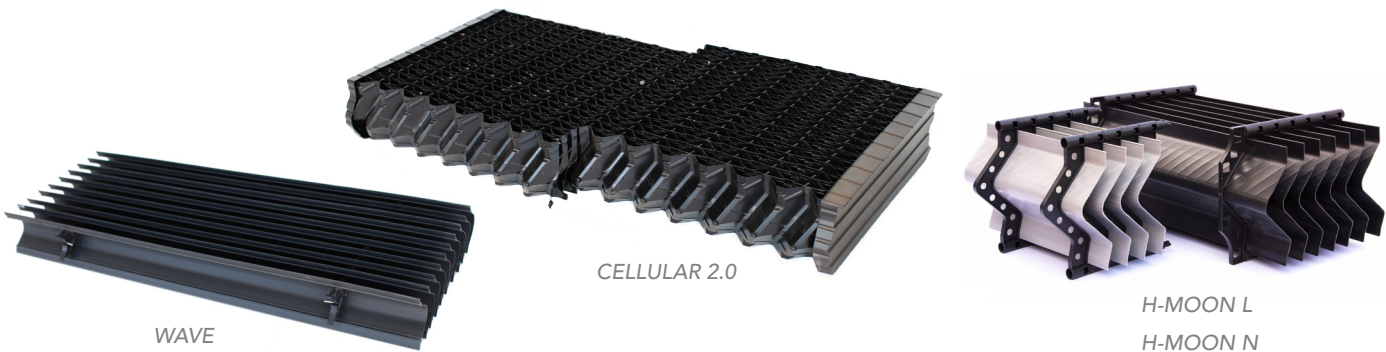
Installed above the distribution level, drift eliminators play an important role by capturing water droplets entrapped in the air stream that otherwise would be lost to the atmosphere. SPIG drift eliminators are made of plastic material (PVC or polypropylene) and are assembled in packs, creating a channel pattern. As the air stream is forced into changing directions when passing through the channels, the water droplets are entrapped and fall to the fill. In crossflow cooling towers in which drift eliminator panels are installed in a vertical position, we adopt a special support to direct the droplets falling down along the drift eliminators directly into the water basin.

Current SPIG drift eliminator designs have been developed and refined through the years based on field applications and performance testing. Prototype tests are carried out on full-scale industrial installations to provide the most accurate results.

Some components have been successfully tested at independent laboratories where the performance estimated by modeling and field tests have been confirmed.



DRIFT ELIMINATOR SUPPORT



WAVE

CELLULAR 2.0

H-MOON L
H-MOON N

Technical Data

	WAVE	CELLULAR 2.0	H-MOON L	H-MOON N
Wave materials	PVC/PP	PVC	PVC/PP	PVC/PP
Spacer materials	PP	N/A	PVC/PP	PVC/PP
Assembly connections	Tie rods	Gluing	Spacers	Spacers
Weight (kg/m ²)	8	6.5	10	14
Profile max. length (m)	4.2	3.6	4.0	4.0
Profile height (mm)	146	148	180	180
Typical drift panel width (mm)	500	300	450	500
Max. distance between supports (m)	2.1	1.2	3.1	3.1
Typical drift loss; %	0.01	0.0004	0.001	0.0005

Notes:

1. Minimum temperatures as low as -40C can be achieved by means of special additives into the raw material.
2. For PP, maximum operating temperature is 80C.
3. The efficiency of drift eliminators is based on the constant air velocity and assumes that drift panels are installed in accordance with the manufacturer's specifications.
4. Elements available in PP can be supplied with self-extinguishing properties by request.

Noise Attenuation System

Typical noise abatement devices are available as baffles at the air inlet and/or on top of fan stacks, mechanical equipment coffins, and low-noise cladding made from FRP. In addition, our Impact Attenuation Wave (IA-Wave) noise attenuation system can be installed to

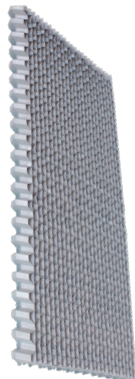


reduce high-frequency noise produced by water fall from fills to water in the basin. This system consists of special inclined profiles adequately spaced to allow for quick drainage of the falling

water. The system is composed of high-quality PVC-extruded elements packed by PP spacers and is installed over the water level in the basin, typically on FRP beams.

Air Inlet Louvers

Air inlet louvers are available to reduce the potential for debris to enter the basin at the cooling tower air inlet. The device is also helpful to avoid the risk of algae and bacteria propagation caused by direct sunlight shining on the basin water. Constructed with PVC light gray thermoformed panels in a standard width of 65 mm, we can also customize panel dimensions to fit most cooling tower applications and FRP support elements.



Multi-row Bundles

For hybrid cooling towers, we can provide heat exchangers with a multi-row bundle configuration. Our controlled aluminum finning process is adaptable for G or L fin configurations with different FPI and pipe diameters from 1 in. to over 2 in. This provides the flexibility for a wide range of applications.



Fan Stacks

A wide range of fan stack diameters and heights can be supplied through reliable partners utilizing SPIG proprietary molds. Flanged fan stack connections are typical, but an overlapped design can also be supplied when requested. Typical material is standard polyester resin or fire-retardant FRP with FSI<25 as per ASTM codes.



Other Accessories

We have developed many other exclusive components to facilitate installation or reduce transportation costs, such as spacers for FRP structures and sleeves, FRP main column supports, and basin shims. We can also supply:

- All mechanical components for electric motors, gear boxes, driving shafts and fans
- Backstop devices, lubrication systems, and sensors to monitor mechanical components
- Firewalls to prevent fire propagation between cells
- Ladders, platforms and stair cases
- UNICO™ cooling tower remote monitoring system
- FRP risers to feed water in each cell, valves
- Vacuum systems, dampers and mixing devices for dry section of hybrid cooling towers
- Fire fighting system
- Cleaning system for heat exchangers

SPIG Wet Cooling Tower Products and Replacement Parts

Our experience includes wet, dry and wet/dry hybrid cooling solutions. We can supply both mechanical and natural draft systems and design for a wide range of project specifications such as high seismic loads, vibration control, corrosion, noise control, sub-freezing operation, and seawater use.



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Quality, Health & Safety, and
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System is certified by



Member in good standing
in the Cooling Technology
Institute since Feb 1993.



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