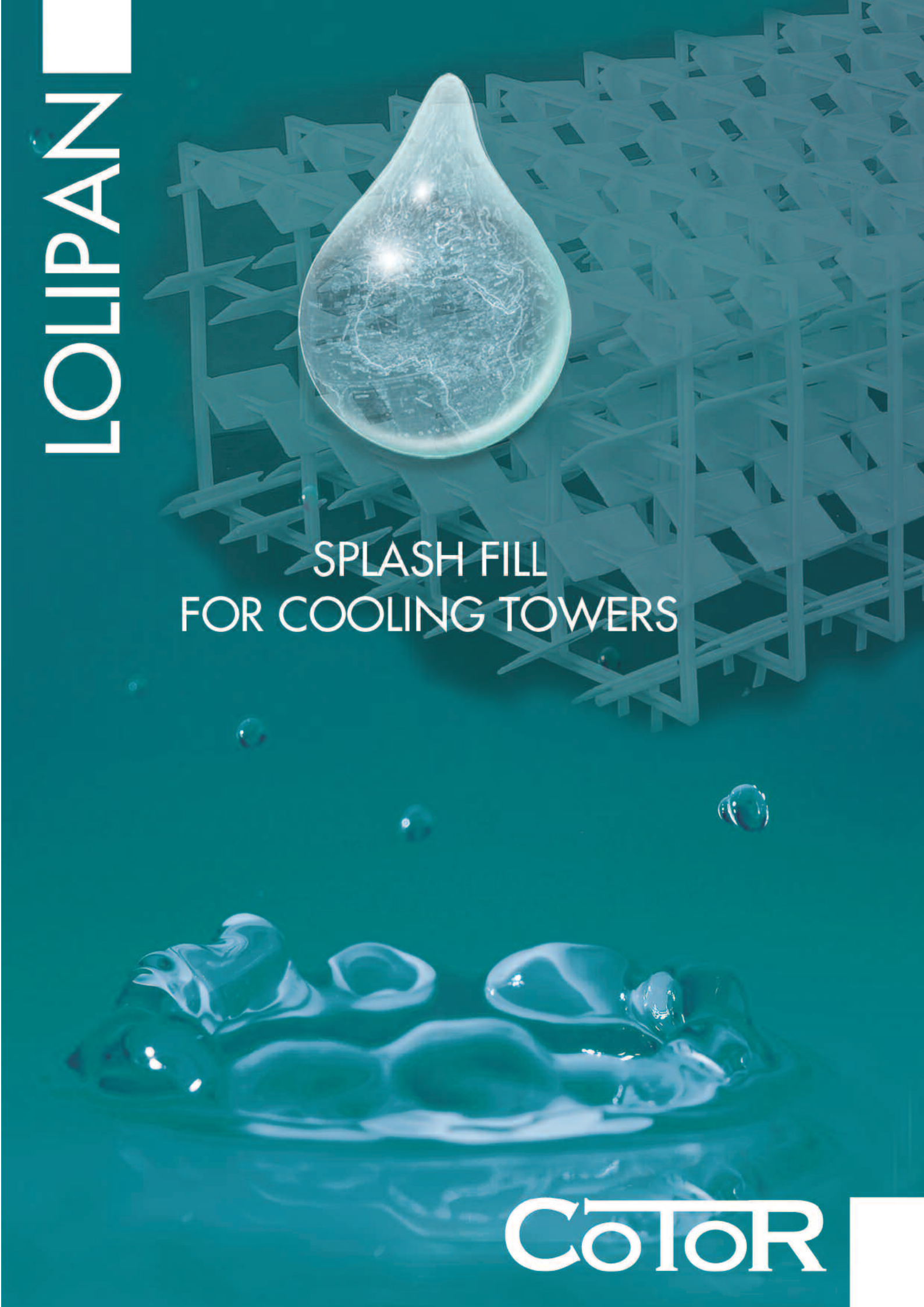
LOLIPAN



SPLASH FILL
FOR COOLING TOWERS

COTOR

COOLING TOWERS
The problem of performance reduction

Cooling tower users are well aware of the decay of the performance of their towers. A reduction in performance is almost given. It is only the time from 100% operation to an "acceptable" level, and then to unacceptability that varies. Rarely is optimum performance achieved; even with clean fill, perfectly distributed air and water flows, and constant, guaranteed, advanced water treatment. Air is not easy to clean and continuously contaminates the system with dust, pollen and other dirt particles. Precipitated salts and/or airborne contaminants are primarily deposited on the fill and spray nozzles.

Even if not obstructed, dirty fill has altered characteristics and different resistance to fluid flow. This results in preferential lanes of flow for air and water that almost never coincide. This makes contact between the fluids random and heat-exchange is diminished.
Spray nozzles are subject to fouling, when present. This changes the water distribution and contributes to the phenomenon described above. When the nozzles are dirty, water pressure is increased on only a few points of the fill. This leads to cracks in fills that are less resistant mechanically; and often clogs other elements in the system.

The performance cycle can be summarized in 3 phases:

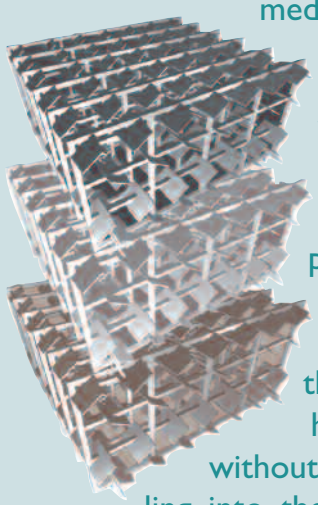
1) 100% performance: new fill
2) Acceptable performance level: satisfies the user's requirements adequately
3) Unacceptable performance level: frequently occurs in summer months, due to much higher ambient temperatures

This final phase, which is often disregarded, is inevitably followed by a continuous drop in performance; accentuated as time passes.

The last two phases often lead directly to production problems and, when unplanned shut-downs occur, expensive maintenance for replacement.

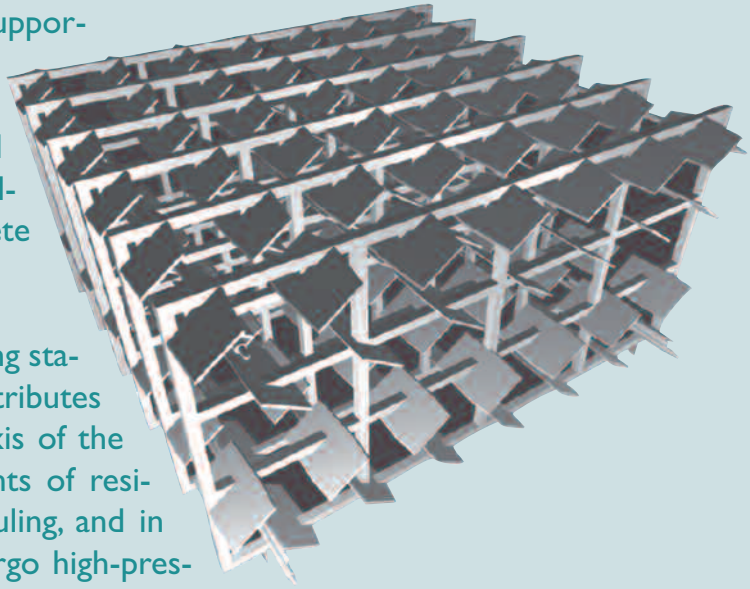
FILM or SPLASH FILL?
The advantages of LOLIPAN splash bars

During initial investment, it is very tempting to use FILM fill, which is known to be optimal and efficient. Its economic advantages are evident. FILM fill is, however, the fill most sensitive to fouling and/or deterioration. Its selection is justified for an expected life-time of more than 5 to 6 years of continuous, efficient, use. However, if the media replacement is normally required on a more frequent basis, we recommend evaluating our original SPLASH fill.



We offer a number of LOLIPAN bars (made from filled polypropylene), which are simply and intuitively assembled into unified sections. These sections can be inserted into the space previously occupied by the FILM media.

LOLIPAN fill is "supported", which means that it can bear a higher dirt load without deformation or falling into the underlying concrete basin, unlike the "hanging" types.



LOLIPAN bars are easy to assembly, creating stable sections. Its very special design distributes mechanical forces perpendicular to the axis of the bar, allowing for extremely high coefficients of resistance. This type of fill is resistant to fouling, and in mechanical terms very tough. It can undergo high-pressure water jet cleaning without damage. It can also resist temperatures up to almost 100°C.

The volume of each LOLIPAN bar is quite large (0.018 m3): this equals a ratio of 56 bars for every m3 of fill. This feature is particularly interesting when comparing the purchase costs of different surfaces. Installation costs of the sections are definitely advantageous: fewer bars and easier assembly result in lower replacement costs.

For these reasons, both as original equipment and during the replacement, LOLIPAN bars are often preferred over traditional FILM fills.

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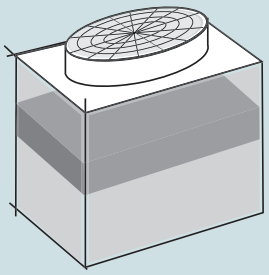
LOLIPAN BARS
Applications

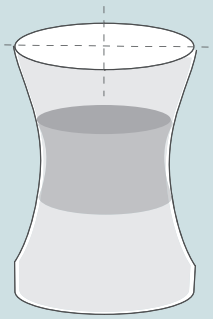
LOLIPAN bars can be used in all types of cooling towers, but they are especially suitable for counter-flows.

- Towers with axial fan suction
- Natural-draft concrete towers
- Towers with axial fan input
- Towers with centrifugal fan input
- Forced-draft concrete towers

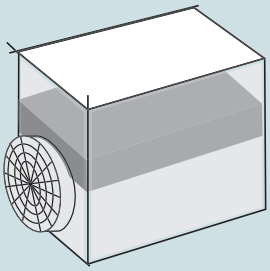
Axial suction



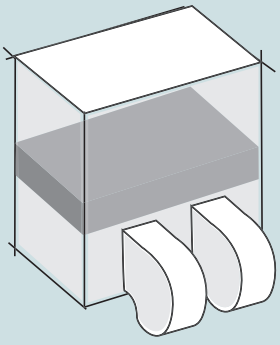
Natural–draft concrete towers



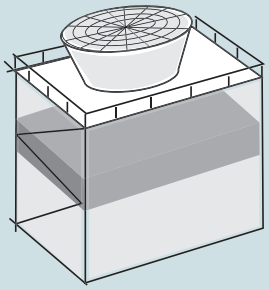
Axial input



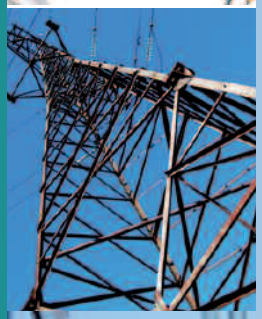
Centrifuge

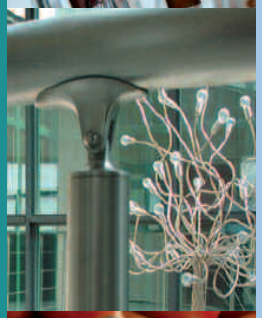
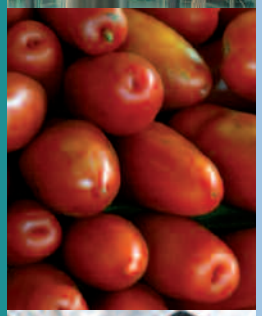


Forced–draft concrete towers








LOLIPAN BARS
Applications

LOLIPAN drift eliminators are particularly suitable for cooling towers in the following industries:

Steelworks
Metallurgic industries
Food processing: tomatoes, fruit juices, drinks
Distilleries
Preserving industries
Chemical industries
Energy production
Glassworks
Water purification and treatment
Sugar refineries

In general, they are suitable for all installations with severe environmental conditions.

Technical Data

Technical Data

• Bar Material	:	Filled Polypropylene
• Production Method	:	Injection Molding
• Minimum Thickness	:	2 mm
• Softening Point Temperature	:	Approximately 98°C
• Sheet Assembly	:	Pressure Plugs Parallel to Surface
• Resulting Sheets	:	Fixed Geometry
• Sheet Dimensions	:	h 300 mm X l 600 mm X w 100 mm X N bars
• No. Bars per Linear Meter	:	10
• No. Bars per m3:	:	56
• Deck Support:	:	Bottom Support
• Bar Main Axis:		Parallel to fluid flow, perpendicular to surface
• Interchangeability:	:	For counter-current flow towers: excellent

Additional information.

EVAPORATIVE TOWERS: The Working Principle

The cooling towers are used to recover heat from water used to cool industrial equipment or processes.

Putting water to be cooled in contact with a constant flow of external air causes evaporation of a small portion of the water. The evaporation process removes heat from the remaining water, transferring it to the air.

This system is by far the most economical and most compact choice when cooling large quantities of water.

Cooling towers can be divided into the following sections:

- Ventilation: the objective of this section is to generate the air flow required to induce evaporation
- Water distribution: this system evenly distributes the water to be cooled on the fill
- Fill: the most important section; the heart of the cooling tower where the water to be cooled comes into contact with the cold air flow
- Drift eliminators: these baffles reduce the amount of drift in the air stream after crossing the fill
- Casing: the "container" that houses all of the sections
- Air inlets: these are the openings that allow the air to enter the cooling tower
- Cold water collection sump

A cooling tower filters a large amount of external air. Unfortunately, all of the particles removed from the air are transferred to the water. Furthermore, the evaporative process results in undesirable salt enrichment of the water, making the circulating water scale-forming.
Special water treatment can reduce the danger of scale-formation, but treatment is not always guaranteed in a constant and efficient manner. Furthermore, no efficient form of defense exists against airborne fouling; to be retry-proof, the fill must be replaced in order to restore the tower efficiency.

The most significant problems occur when the water to be cooled collects contaminants during the production cycle (ex. chips from tempering, lubricants, organics, etc.). For these processes, SPLASH fill is the only choice.

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