

Service for Evaporative Cooling

When is service required ?

Reasons for the requirement of SERVICE:

- 1. Damage or complete breakdown (casing, mechanical, hydraulic)**
- 2. Drift loss through drift eliminator or louvres**
- 3. Wear and tear (with negative influence on function and performance)**
- 4. Fouling by air and water (with neg. influence on funct./perform.)**
- 5. Insufficient thermal output**
- 6. Changed design conditions / Reconstruction of towers**
- 7. High noise emissions (restrictions by neighbours or government)**
- 8. Vibrations**

1. Casing - Where is service possible ?

SERVICE-requirements at the CASING:

- Leakages
 - Corrosion of steel parts
 - Damages
 - Wash out of resin at fibreglass
 - Damages of louvers
 - Water loss through louvers
 - leakages at man hole / inspection door
- Sealing, making it tight
- Laminating work (GRP)
- Exchange of steel parts
- Optimizing or exchange of louvers, install splash plates or wind baffles
- Exchange or install man holes / inspection doors



1. Hydraulic part - Where is service possible ?

SERVICE-requirements at hydraulic part, COOLING FILL:

- Damages (i.e. at high temperature, chemical influences)
- Fouling
- Damaging through aging
- Insufficient thermal output

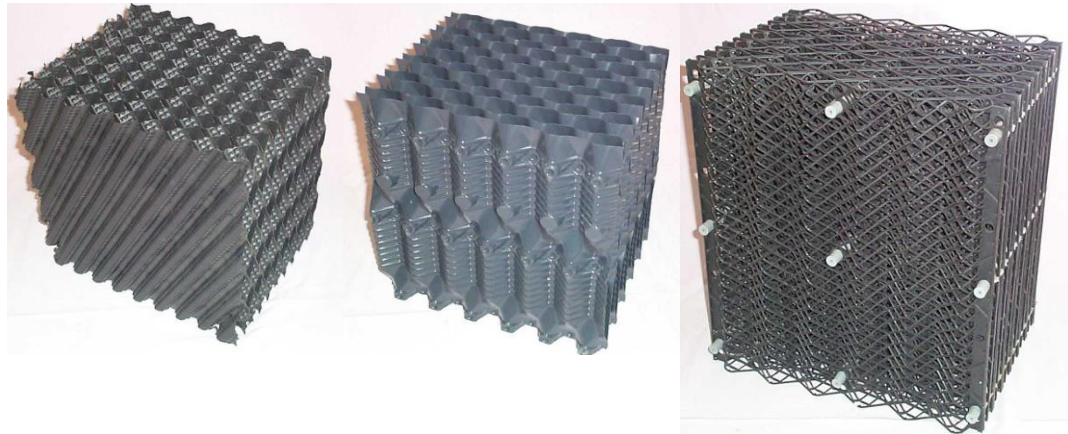
→ Cleaning

→ Exchange

→ Reduce fouling by optimized fill type

→ Increase thermal output by optimized fill type and/or raise fill height

→ Analyze water quality and optimize or install water conditioning system



1. Hydraulic part - Where is service possible ?

SERVICE-requirements at hydr.part, WATER DISTRIBUTION:

- Damages
- Fouling
- Hydraulic overload
- Less hydraulic load as designed



→ **Cleaning**

→ **Exchange of pipes, channels, sprayers, nozzles**

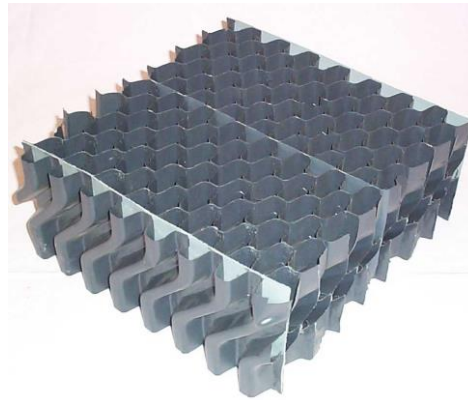
→ **Reduce fouling by optimized water distribution (channels, sprayers)**

→ **Adapt nozzles or water distribution according actual hydraulic load**

2. Hydraulic part - Where is service possible ?

SERVICE-requirements at hydr.part, DRIFT ELIMINATOR:

- Damages
- Fouling
- High Drift loss

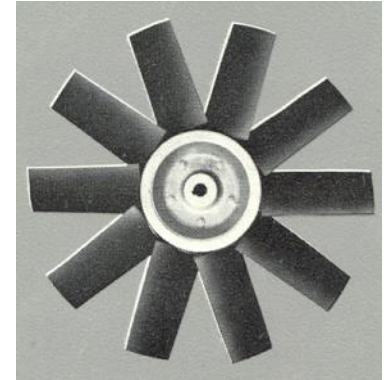


- **Cleaning**
- **Exchange**
- **Reduce fouling and legionella problems by closed profile construction**
- **Reduce drift loss by optimized drift eliminator type or double layer**

3. Mechanical part - Where is service possible ?

SERVICE-requirements at mechanical parts, FAN:

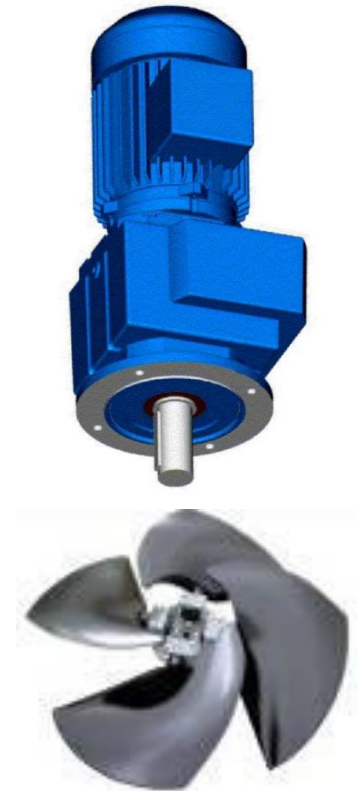
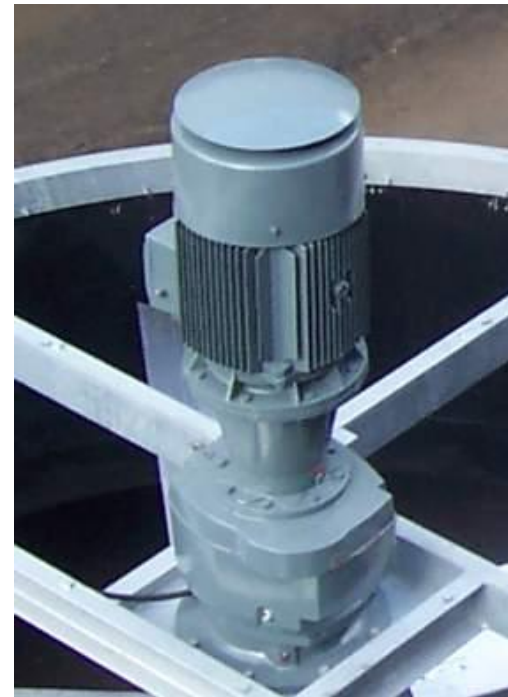
- Damages
 - Corrosion
 - Wear and tear of leading edge
 - Imbalance
 - Insufficient performance
-
- Exchange
 - Recondition
 - Repair blades or leading edges (new l.e.protection)
 - Balancing on site
 - Optimize blade angle
 - Increase thermal output by optimized fan type



3. Mechanical part - Where is service possible ?

SERVICE-requirements at mechanical part, MOTOR-/GEAR:

- Damages
 - Corrosion
 - Wear and tear of bearings
 - Oil losses
 - Short circuit
 - Loss of V1- weather hat (corrosion)
-
- Exchange
 - Recondition
 - Repair
 - Exchange of oil



4. Mechanical part - Where is service possible ?

SERVICE-requirements at mechanical part:

FAN SUPPORT:

- Damages
- Corrosion
- Exchange/ New coating

FAN PROTECTION GRID:

- Damages
- Corrosion
- No existing protection grid
- Exchange, install

FAN STACK:

- Damages
- Corrosion
- Exchange
- Repair/ Extension / Lamination



4. Repair and Maintenance

TOPIC

Although cooling towers are designed for use in industrial environments, they are still subject to constant operational wear. Air and water can also affect a system's cooling performance and economic efficiency.

SOLUTIONS

Repairing and replacing parts is therefore necessary to ensure availability and economic efficiency. A cooling tower outage can result in limited production or even no production at all.



We Ensure Operational Readiness and Continuity in Cooling Systems

4. Repair and Maintenance

Repair of Fan blades

Fan blades made of GRP are exposed to heavy wear on their leading edges. Our GRP specialists are able to avoid cost-intensive replacements through professional repairs.



We Ensure Operational Readiness and Continuity in Cooling Systems

5. Insufficient thermal output

SERVICE-requirem. for INCREASING THERMAL OUTPUT:

- **Change blade angle**
 - acc. maximum of rated current of motor
- **Improve air inlets**
 - to reduce pressure loss and to increase air flow
- **Change fill**
 - improve efficiency by different type of fill 12 mm flute size instead 20mm
- **Increase fill height**
 - to reduce pressure loss and increase air flow
- **Exchange mechanical components**
 - to increase air flow
 - by a more efficient fan (more blades)
 - by higher speed
 - will require more motor power

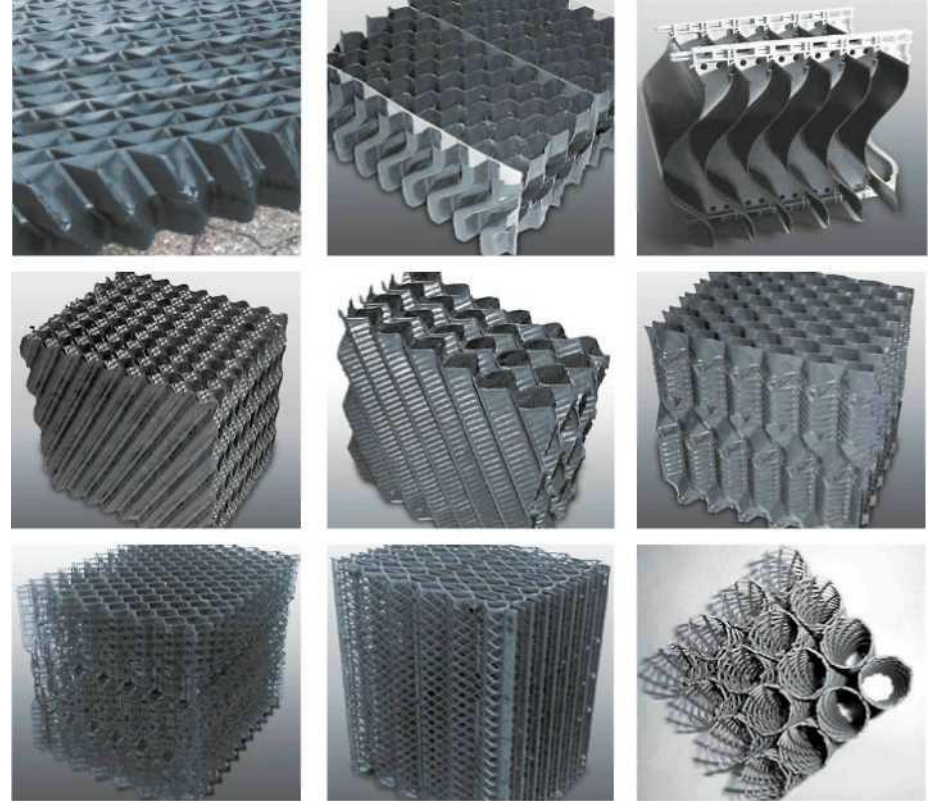
6. Reconstruction of Counterflow Cooling Towers

TOPIC

New technologies can optimize the performance and cost of reconstructions. In many cases they can even help save additional costs when the cooling tower to be reconstructed also needs repair. These are excellent reasons to let us show you how our custom-engineered solutions can effectively increase the thermal performance, reduce fouling, simplify maintenance and minimise the drift rate of your cooling tower.

SOLUTIONS

Our range of special fill types is one such technology. Also on the mechanical equipment side there are countless ways to optimise the drives and fans. We calculate these options based on the customer's specific situation. In addition to performance and air flow requirements, structural prerequisites and noise minimisation are also extremely important.



Our Technologies Minimise Costs

Row 1:

6. Reconstruction - Asbestos Abatement

TOPIC

Materials containing asbestos were used for cooling fill, water distribution systems and drift eliminators until around 1980.

The reason: Asbestos cement is robust and corrosion resistant.

The problem: Asbestos is a carcinogen.

SOLUTIONS

Refurbishment work in areas where materials containing asbestos are present can only be carried out by professionals officially qualified to do so. Official qualification comprises the technical regulations and special protective measures for hazardous materials according to TRGS 519.

SPX Cooling Technologies has precisely this expertise and brings extensive practical experience with safe asbestos handling to every project.

**WARNING CONTAINS
ASBESTOS**
**Breathing asbestos dust is
dangerous to health**
Follow safety instructions



When No Less Than Professional Competence Will Do

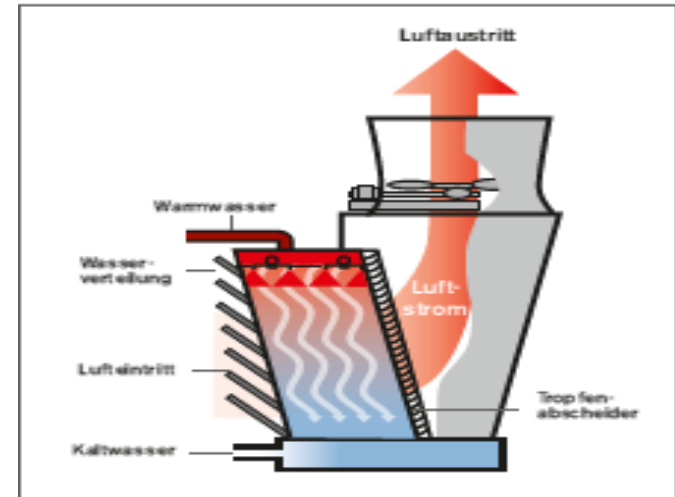
6. Reconstruction of Crossflow Cooling Towers

TOPIC

New technologies can optimise the performance and cost of reconstructions. In many cases they can even help save additional costs when the cooling tower to be reconstructed also needs repair. These are excellent reasons to let us show you how our custom-engineered solutions can effectively increase the thermal performance, reduce fouling, simplify maintenance and minimise the drift rate of your cooling tower.

SOLUTIONS

Our range of special fill types is one such technology. Also on the mechanical equipment side there are countless ways to optimise the drives and fans. We calculate these options based on the customer's specific situation. In addition to performance and air flow requirements, structural prerequisites and noise minimisation are also extremely important



Kreuzstrom-Funktionsprinzip



Folieneinbau



Our Technologies Minimise Costs

7. Noise Control – Possible measures at air inlet

Air inlet:

- Emissions of mechanical part and water
 - Install water impact absorbers
 - Reduce noise extension by optimized air inlet louvres
 - Install noise absorbing walls



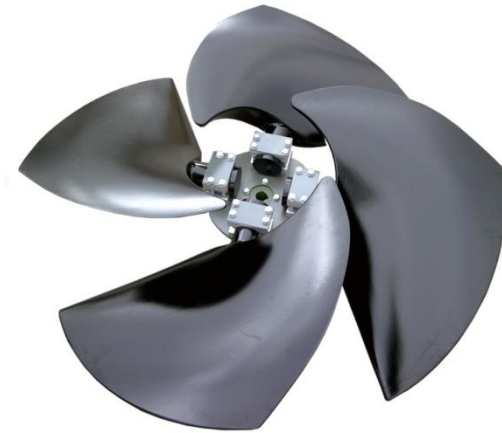
7. Noise Control

TOPIC

Mechanical draught cooling towers emit noise, primarily from the inlet and outlet air openings, trickling water, and the fan assembly. SPX Cooling Technologies offers effective solutions to these problems.

PRIMARY MEASURES

To preclude any impairment of cooling tower performance, primary measures that prevent noise are preferred. These measures include especially low-noise fan designs and drives. Special insulating structures can be used to prevent or reduce water splash noise.



Our Services – a variety of effective measures

7. Noise Control - Examples

Sound attenuators –package

→ Silencers with noise absorbing baffles arranged in the air inlet and outlet area will reduce the noise emissions but also the performance of the cooling tower. They have to be designed in correspondance with the thermal design of the cooling tower and the fan design.



Outlet



Inlet & Outlet

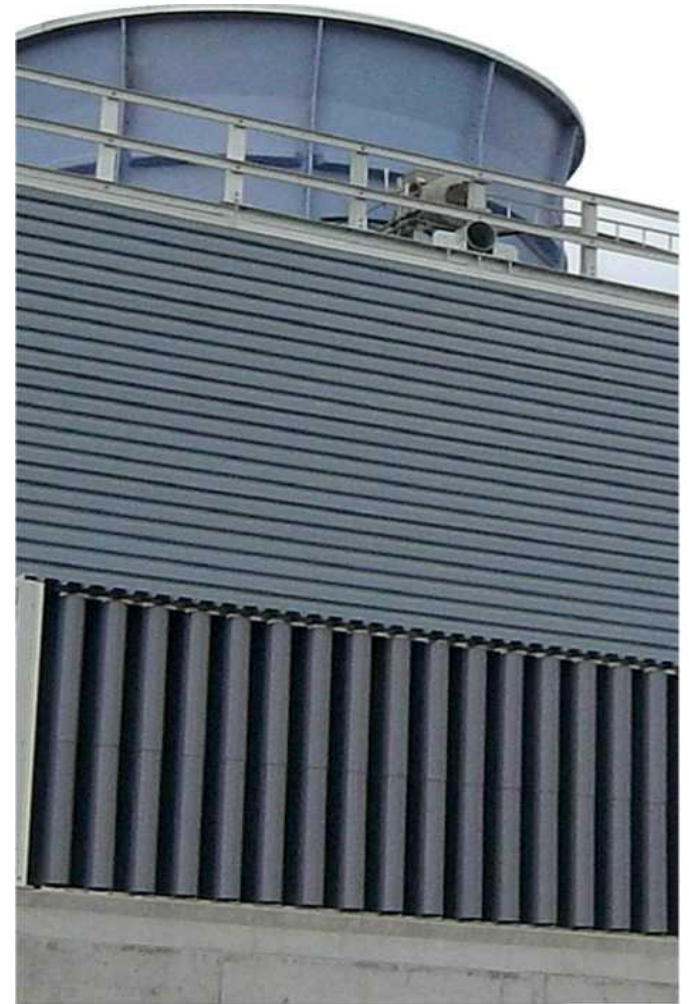
7. Noise Control

TOPIC

Mechanical draught cooling towers emit noise, primarily from the inlet and outlet air openings, trickling water, and the fan assembly. SPX Cooling Technologies offers effective solutions to these problems.

SECONDARY MEASURES

Only if the primary measures are insufficient are secondary measures required, such as acoustic barrier walls or silencer splitters fitted to the air inlet and outlet. However, they produce pressure losses by reducing the air cross-sections and require the fan output to be adjusted. The technology and design can be adjusted precisely to the specific requirements.



Our Services – as Diverse as they are - they are effective

Example – Recon job

Example: 2 package cooling towers each 13 m²
Increase of thermal output (+ 27%) and
noise reduction (-10 dB(A))

before



after



8. Vibrations - Inspection and Maintenance

TOPIC

We inspect our customers' cooling tower systems on a periodic basis or on request. We use VDMA standard sheet 24649 on instructions and recommendations for effective and safe operation of evaporative cooling plants.

SOLUTIONS

Our experts carefully inspect all details and create documentation including critical evaluations and clear recommendations. Maintenance also involves activities such as changing oil, lubricating, cleaning, checking tightening torques, field balancing, and safety inspections, and all steps are documented. We also offer flat rate inspection and maintenance agreements.



For Operational Reliability and Economic Efficiency

SERVICE or NEW COOLING TOWER depends on:

- Overall Condition of tower
- Availability of spare parts
- Individual comparison of costs between “Service” and “New”. For “New” investment do not forget dismantle and scrapping of “Old” tower and possibly new foundations, pipings, electrical installation and required permissions by the goverment.
- Budget of the customer
- Internal ways of decisions for “Service” and “New” are very often different:

Service: Maintenance dept.Purchasing dept.

New: Engineering dept. Purchasing dept. (3 competitors)

