

Crossflow cooling towers

XE - XT - XL - XM



[Background]

GEA Polacel

GEA Polacel is a company of the GEA Group AG. The GEA Group, headquartered in Bochum, Germany, is a globally successful technology group with more than 250 companies in 50 countries.

- One contact person for all solutions
- Globally active in more than 40 countries
- Individual solutions
- Maximum availability, security of operation and system efficiency

The company now focuses on specialty mechanical engineering – especially process engineering and equipment. GEA Group technologies are applied in the food, chemical and petrochemical industries, the energy sector, air treatment and shipbuilding as well as the pharmaceutical and cosmetic industries. The GEA Group is one of the world's market and technology leaders in 90 per cent of its businesses.

GEA is a solid foundation for the GEA Polacel activities and it provides us with greater scope. Good contacts with affiliated organizations that are leaders in our field provide an ongoing stimulus to our own development. This is what makes GEA Polacel a leader in the introduction of technological improvements.



[System's functions]

The effect of crossflow

Using the crossflow principle, warm water flowing down through a cooling unit is cooled by air drawn upwards by a fan.

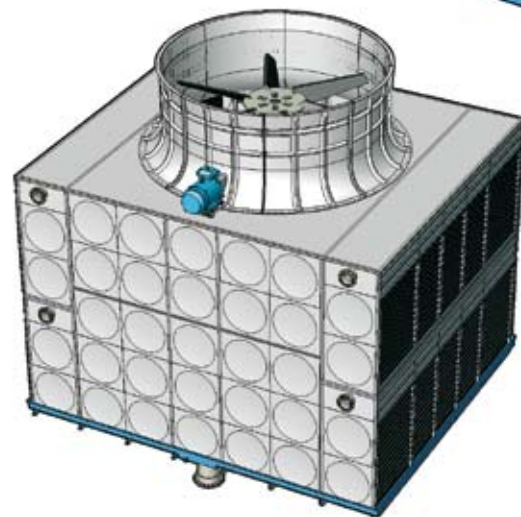
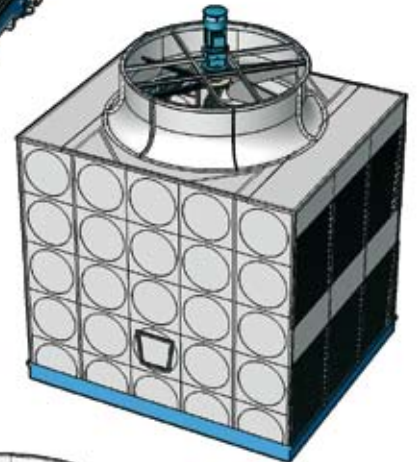
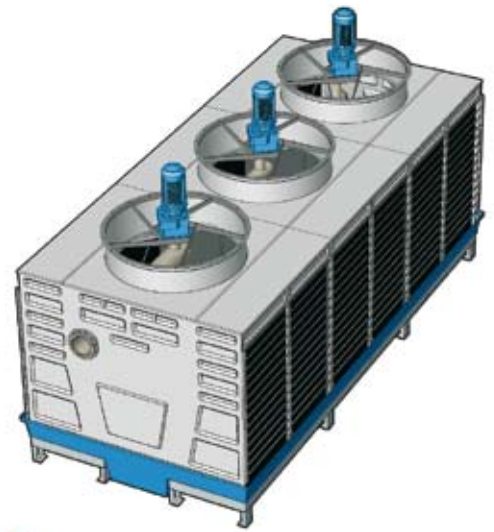
Evaporation and direct heat exchange cause the temperature to fall rapidly. Compared to counterflow cooling towers, induced-draught crossflow cooling towers are much quieter and smaller. The performance figures are next to perfect.

[Know how]

GEA Polacel crossflow cooling towers

Polacel designs, manufactures and maintains cooling towers for process and climate cooling. Our energy-efficient and environmentally cooling water generators stand out because of the complete quality policy we employ.

The Polacel crossflow cooling tower is quiet and economical, and has a high cooling capacity. The modular system can be easily adjusted to suit cooling requirements and the space available. The cooling towers have optimal performance and run problem-free. The considerable savings in water usage (95%+), and the exceptionally low noise level make the economical crossflow cooling towers the best choice for both man and the environment.





Cooling Tower type 3 XMS 2.720
Telephone-/Communication center in
the Netherlands

[Maximum efficiency]

Measuring cooling performance: the wet bulb

The wet bulb temperature is in fact the lowest temperature that can be achieved by air cooling in any given situation.

This temperature is measured by wrapping a glass thermometer in a cotton cover that has been soaked in water, and placing it in a stream of air. The water will evaporate and extract heat (sweating during physical exercise performs the same function and makes a 'cooling tower' out of our skin). The wet bulb temperature is therefore lower than the ambient temperature.

Cooling towers try to achieve this minimum temperature the most economic and efficient way possible. The GEA Polacel crossflow cooling tower range achieves this and successfully balances cooling performance with low power consumption (low cost) and low noise.

[Modular system]

Made-to-measure comes as standard

When choosing a cooling tower, the four most important factors are: the cooling water temperatures (inlet and outlet), the wet bulb temperature, the noise emissions, and the water requirements.

GEA Polacel assesses the specific requirements together with the client, and uses this assessment to develop a suitable design. The expandable modular system is flexible enough to solve all kinds of capacity demands as 'standard'. However, for the customer with special needs, the Polacel engineers will build a tailor-made solution.



Placing Cooling Tower with crane on steel construction

[Low Noise]

Noise and other environmental considerations

Cooling towers are usually mounted outdoors, often on a roof and in the middle of a residential area. That is why any noise caused by the fan, falling water, the electric motor and the gearing could pose a potential problem.

In order to reduce noise levels, GEA Polacel has created a number of important features. Larger fans (lower speed, less noise, greater efficiency), pressure-less water distribution, cooling units that run down into the water tank, and other noise-reducing measures all combat the various problem areas.

GEA Polacel makes detailed calculations to show exactly what, and how much, noise the cooling tower will make. GEA Polacel can also make advance calculations for all the requirements that are placed on cooling towers by noise regulations and environmental permits.

GEA Polacel engineering

Other prominent distinguishing features of the crossflow design are:

- The design of the fan section and the larger fan ensure lower energy consumption and result in an important reduction in noise.
- A crossflow cooling tower with a large axial fan uses around 70% less energy than a counterflow cooling tower with a centrifugal fan.
- Using a geared motor to drive the fan, the cooling capacity can easily be adjusted as required.
- The pressure-less water distribution system is energy-efficient, and the water pan is easy to clean.
- The cooling units are mounted in such a way as to make cooling per unit possible. The advantages of this technique are savings of energy, the ability to adjust the capacity, and the easy access for maintenance. Capacity can also be adjusted by regulating the water flow. (The water distribution system and the cooling units can be adjusted to suit the amount of water used.)
- The air inlet louvres create ideal air inflow and minimize water loss caused by splashing.
- The design takes into account the possible need for variation in capacity, operation during maintenance, and other features the client may require.
- Clients can choose from four standard models in the crossflow range, each model with different air speeds.



Skeletal and fan of the Cooling Tower from the inside view



Cooling Tower type 3 XM 2.2.720
Chemical plant in Germany

Structural qualities

The advanced design engineering has also resulted in a number of special structural advantages:

- Only a minimum number of support points are necessary as a result of the self-supporting foundations and the high internal rigidity.
- Where possible, the cooling tower is fully portable and installed ready-to-go.
- The GEA Polacel frost-proof polyester water pan can withstand sub-zero temperatures. Essential for free-cooling applications.
- Due to their low profile, crossflow cooling towers present fewer aesthetic problems.
- The expandable modular system has virtually no limitations in terms of shape and size.
- All structural design principles are analysed and tested in advance using dynamic calculations and computer studies.

Cooling Tower type XT 2.720
Hospital in the Netherlands



[Maximum quality]

Durable and reliable

GEA Polacel designs and manufactures cooling towers that have a long life and require a minimum of maintenance.

This performance is achieved by a careful choice of materials - stainless steel combined with glass fibre reinforced polyester and plastics - the exceptionally sound design and the considerable experience of our engineers. 'Cheap and cheerful' solutions such as fans with a V-belt drive, or painted panels, are avoided. The result is a cooling tower that is low maintenance, economical and able to deliver a consistently high quality, problem-free performance.



Cooling Tower type XL 2.320
Chemical Plant in the Netherlands

[All around support service]

Advice and service

GEA Polacel builds cooling towers that meet exact specifications. Our sales engineers give advice, analyse your needs, and personally make sure, up to and including the installation, that your order is carried out completely according to your instructions.

The GEA Polacel service department specializes in cooling tower maintenance. Irrespective of make or type, the maintenance specialists know the ins and outs of the whole technical area, and are up to date with all the latest developments. GEA Polacel has over thirty years of experience in cooling tower maintenance. We work in accordance with the requirements specified by ISO, VCA, VDMA, CTI and Eurovent. The technicians can carry out the proper maintenance at any location and within practically any time-frame.



Cooling Tower type XL 2.320
Chemical Plant in The Netherlands

Companies of the Thermal Engineering Division

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 GEA Power Cooling Inc. (GPC)
 Lakewood, USA
www.geapowercooling.com
 GEA Rainey Corporation (GRC)
 Catoosa, USA
www.gearainey.com
GEA Polacel Cooling Towers LLC (PCLUS)
 Houston, USA
www.polacel.com
 GEA Power Cooling Inc. (GPC)
 Clearwater, USA
www.geapowercooling.com

EUROPE
 GEA Energietechnik Ltd. U.K.
 Staffordshire, Great Britain
www.gea-energietechnik.com
 2H Aqua Ltd. UK (ZHKUK)
 Huntingdon, Great Britain
www.gea-2h.com
 GEA Batignolles Technologies Thermiques S.A.S. (BTT)
 Nantes, France
www.btt-nantes.com
 GEA Airflow Services S.A.R.L. (AFS)
 Nantes, France
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 GEA Ibérica S.A. (GIB)
 Igorre, Spain
www.geaibericasa.es
 GEA Scambiatori di calore S.r.l. (GSC), Monvalle, Italy
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 GEA EGI Contracting/Engineering Co. Ltd. (EGI)
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 GEA Luftkühler GmbH (GLK)
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