



Customized OEM cooling units
Product range

WK water-cooling equipment

«There is no dispute nowadays regarding the importance of specific cooling in increasing performance and quality because high levels of accuracy are totally impossible without stable temperature conditions. By specifically stabilising temperatures, WK water-cooling equipment provides an improvement in quality and an increase in production.»

Every water-cooling unit is specifically designed and built precisely to the customer's requirements, without any extra development or additional charges. We use the modular construction basic model produced in our factories in Switzerland as a basis.

WK water-cooling equipment is used in a wide variety of applications, such as:

- In metal-removing and shearing machine tools: for grinding, turning, milling, boring, laser cutting, etc.
- In plastics processing machines for heat moulding, blow moulding, injection moulding and pressure moulding
- In surface treatment equipment for plasma coating, hot dip galvanising
- etc.



Above:
WKL water-cooling equipment

Below:
WKW water-cooling equipment
with heating zones
ef «Multizone»

WK water-cooling equipment is used in a wide variety of designs, differing in:

- Internal and external construction
- Air or water-cooled
- One or more refrigeration circuits
- One or more coolant circuits
- With free cooling and/or heat recovery

Only first class components available worldwide are used for WK water-cooling equipment.

- Sturdy casing frames, colour to customer's choice
- Compressor, coolant collection tank, thermal or electronic-expansion valve, monitoring equipment, air or water-cooled condenser.
- Tube or plate heat exchanger
- Electric control unit in the control cabinet fully wired to world wide regulations
- Water tank with pump
- Conduit heating
- etc.

WKL water-cooling equipment

In air-cooled water-cooling equipment, the condenser is compactly integrated into the unit with axial fans. In the split design, an external condenser is used.

Performance data

Refrigeration output Q ₀	to 5 MW (to 4.3 Mio. kcal/h) Flow rate as required
Operating temperature	-25 to +50 °C
Target value tolerance	±2 (max. ±0,1) K
Refrigerant	R 407C / R 134A / R 404A
Ambient temperature	Standard +5 to +35 °C Special -35 to +55 °C

WKW water-cooling equipment

In water or brine-cooled equipment, a tube or plate condenser is used. The coolant for the condenser can be brought either to a cooling down unit, cooling tower or a hybrid unit. Via a heat recovery system, the extracted heat can also be used to heat domestic heating and hot water systems.

Performance data

Refrigeration output Q ₀	to 5 MW (to 4.3 Mio. kcal/h) Flow rate as required
Operating temperature	-25 to +50 °C
Target value tolerance	±2 (max. ±0,1) K
Refrigerant	R 407C / R 134A / R 404A
Ambient temperature	-40 to +35 °C -40 to +40 °C
- With cooling down unit	-40 to +35 °C
- With cooling tower or hybrid cooling unit	-40 to +40 °C

OK oil-cooling equipment

«To produce a high quality, accurate end product first requires that the thermal stabilisation of the production process be absolutely precise. ef's high-quality oil-cooling equipment is of modular construction and designed and developed in Switzerland.»

All oil-cooling equipment is designed and built here in Switzerland. The large library of oil-cooling units that we have already constructed all over the world is used as a basis for new developments to meet very special requirements.

OK oil-cooling equipment is used in a wide variety of applications, such as:

- In metal-removing and shearing machine tools: for turning, grinding, sharpening, milling, boring, cold rolling, etc.
- In presses for die stamping, deep drawing and embossing
- In various hydraulic systems in plastics processing machines
- etc.



Above:
OKL oil-cooling equipment

Below:
OKW oil-cooling equipment

OK oil-cooling equipment is used in a wide variety of designs, differing in:

- Internal and external construction
- Air or water-cooled
- One or more refrigeration circuits
- One or more coolant circuits
- With free cooling and/or heat recovery

Only first class components available worldwide are used for OK oil-cooling equipment.

- Sturdy casing frames, colour to customer's choice
- Compressor, coolant collection tank, thermal or electronic expansion valve, monitoring equipment, air or water-cooled condenser.
- Tube or plate heat exchanger
- Electric control unit in the control cabinet fully wired to worldwide regulations
- Oil tank with pump
- Conduit heating
- etc.

OKL oil-cooling equipment

In air-cooled oil-cooling equipment, the condenser is compactly integrated into the unit with axial fans. In the split design, an external condenser is used.

Performance data

Refrigeration output Q _o	to 100 kW direct (to 86'000 kcal/h) over 100 kW indirect
Flow rate	as required
Operating temperature	+10 to +45 °C
Target value tolerance	±2 (max. ±0,1) K
Refrigerant	R 407C / R 134A
Ambient temperature	Standard +5 to +35 °C
Special	+5 to +45 °C

OKW oil-cooling equipment

In water or brine-cooled equipment, a tube or plate condenser is used. The coolant for the condenser can be brought either to a cooling down unit, cooling tower or a hybrid unit. Via a heat recovery system, the extracted heat can also be used to heat domestic heating and hot water systems.

Performance data

Refrigeration output Q _o	to 100 kW direct (to 86'000 kcal/h) over 100 kW indirect
Flow rate	as required
Operating temperature	+10 bis +45 °C
Target value tolerance	±2 (max. ±0,1) K
Refrigerant	R 407C / R 134A
Ambient temperature	
- With cooling down unit	-40 to +35 °C
- With cooling tower or hybrid cooling unit	-40 to +40 °C

Cooling equipment for special applications

«ef cooling, in collaboration with its technology partners throughout the world, provides the optimum cooling system for any production plant. The experience from resolving hundreds of cooling problems is combined with the latest technology and ideas for optimising energy are used to provide solutions to complex cooling requirements»

These cooling equipment is designed and built precisely to meet your requirements and comes fitted with any necessary accessory. Our water- and oil-cooled systems are used as a basis, with plant-specific additions, such as:

- Water desalination systems
- Water filtration
- Built-in or external tank pumping unit
- Special voltages
- 50 Hz / 60 Hz designs, all voltages
- With free cooling and/or heat recovery

The temperature can be regulated in many different ways, such as:

- 2-position regulator
- PID regulators with target value input
- Temperature differential regulation based on a reference temperature (e.g. the machine bed temperature)
- SPS Integration

There are no limits to the cooling requirements worldwide, in vastly different processes. ef cooling's team can also solve your problem.

WOK water/oil-cooling equipment

Every cooling system can be combined based on different forms of coolant. Water/oil-cooling equipment is a combination for cooling water/emulsions and oil. The advantages are the compact nature of the unit with a single refrigeration circuit and two or more coolant circuits. We build water/oil-cooling equipment according to application or the customer's wishes in air or water-cooled design with the operating accessories desired.

Performance data

The performance details correspond to the values for water and oil-cooling equipment.

Cooling equipment with free cooling and/or heat recovery

From the point of view of optimising energy and saving the environment, in larger plants it makes sense to transfer the extracted heat to the domestic heating and hot water systems by means of a heat recovery system.

In areas where the external temperature often falls below the initial temperature, it is useful to operate the cooling unit without compressor cooling in free cooling mode. This can reduce operating costs by up to 80%. Free cooling mode, even in combined pre-cooling operation, places less load, or even no load, on the components of the cooling equipment and the fluid cooler, increasing the life of the system as a whole.



Above:
water-water-oil-cooling equipment WWOKL

Below:
Central cooling system with free cooling

Turnkey plants

«Turnkey concepts spare you the requirement for expensive additional work. We construct your central cooling system on a turnkey basis so you have the time to get on with your core tasks. Energy analysis, engineering and design for subsequent extensions are all included.»



Above:
Plastics production plant in China

Middle:
Tank pumping unit

Below:
Central cooling system with tank pumping unit

For example:

Turnkey systems in the plastics industry take on a very wide variety of cooling requirements, all of which can be covered by a central cooling system.

Therefore, you require very high cooling performance for cooling moulds for individual machines. The water-cooling equipment is erected either inside or outside and designed for an external temperature of -35 to +55 °C. The cooling quality affects the cycle time's speed and therefore also the product costs.

With the same central cooling system, in part with integral pre-cooling, you can also cool the hydraulic systems for each individual machine. The water-cooling equipment holds the coolant system at a constant 25 to 30 °C.

In central cooling systems, heavy demands are placed on the cooling water distribution and regulatory systems to ensure the correct temperature for the highest product quality at each cooling station.

In turnkey systems, we take over the design, planning and onsite installation for you, in accordance with your instructions. We design the cooling equipment, plan the optimum pipe runs for the refrigeration- or coolant circuits and install the pre-assembled plant on site using our own specialist engineers. On request, we can provide you with an energy analysis and a design for possible future extensions.

Turnkey plants are as individual as your own cooling requirements, which we will gladly resolve for you.

**ef cooling, in collaboration
with its technological partners
throughout the world, provides
the optimum cooling system
for each production plant**

We plan, develop, construct and build cooling systems. In so doing, we have now solved, to date, some one thousand temperature problems, even though hardly any job was the same as any other.

We manufacture and carry out our Research & Development, Servicing, Sales and Marketing activities in Dällikon/Zurich, Switzerland. Some years ago, as part of the continuous strategy for growth, ef Productions AG was established, especially to produce mass-produced systems.

We have been developing and marketing industrial cooling systems worldwide since 1964. During this time, we have built up a network of development and technological partners, from which nowadays all our customers can benefit.

We regularly invest specifically in the development and evaluation of new technologies and products, paying particular attention to environmental friendliness, energy savings, economy and increase in quality.

ef cooling is your address for:

- Water coolers
- Oil coolers
- Multizone cooling/heating units
- Customer-specific and combined units
- Cooling systems for various other media
- Heat-recovery plants and designs
- Free-cooling plants and designs
- Prototypes and serial production
- Engineering
- Servicing and recycling



ef cooling

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the smart way of cooling!