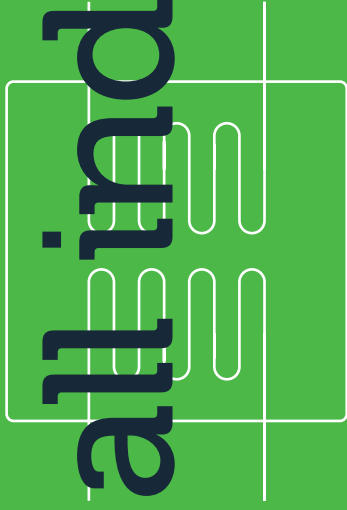




Engineered Thermal Solutions

**IWC is a specialist
EPC contractor,
providing engineered
thermal solutions to
all industries**



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About us

Industrial Water Cooling (IWC) is a specialist EPC contractor that has been providing engineered thermal solutions to industries across the African continent since 1986. IWC's core products include cooling towers, heat exchangers and chillers, along with their allied spares and services.

We strive to design and implement thermal solutions that have a lower environmental impact by targeting a reduction in water use, energy use and carbon emission. We achieve this by being highly consultative with all our clients, focusing on technical operation, capacity building, quality manufacturing and implementation.

With heavyweight clients such as Eskom, ArcelorMittal, Foskor, Impala Platinum, Anglo Platinum, SASOL, CHEVRON amongst others, it's safe to say that we set the benchmark in the industry. Our extensive portfolio of projects illustrates our activity across the SADC region. We have provided solutions in Zambia, Tunisia, Ghana, Mauritius, Mozambique, Kenya, Uganda, DRC, Malawi, Senegal, Morocco, Namibia and Swaziland. Our international reach extends to Vietnam, Australia and Sweden.

We are a long-standing member of the CTI, Cooling Technology Institute, based in the USA. This association has as its members both constructors as well as end users of cooling towers. Our company focus is based on high quality (ISO 9001:2015 accredited company) and excellent service standards, while still maintaining a competitive pricing structure.



Our vast experience and knowledge of the industry has resulted in us being able to offer a range of services from feasibility studies to the installation of a complete plant on an EPC basis.

Our Extensive Range



01 Cooling Towers

Cooling towers from factory assembled package cooling towers, to large field constructed mechanical and natural draught cooling towers, as well as thermal upgrading and the refurbishment thereof.



02 Heat Exchangers

A comprehensive service offering for the supply of new and spare parts for heat exchangers including gasketed plate & frame, welded and semi welded, spiral and other specialised heat exchangers.



03 Refrigeration

High efficiency, energy efficient industrial chillers.

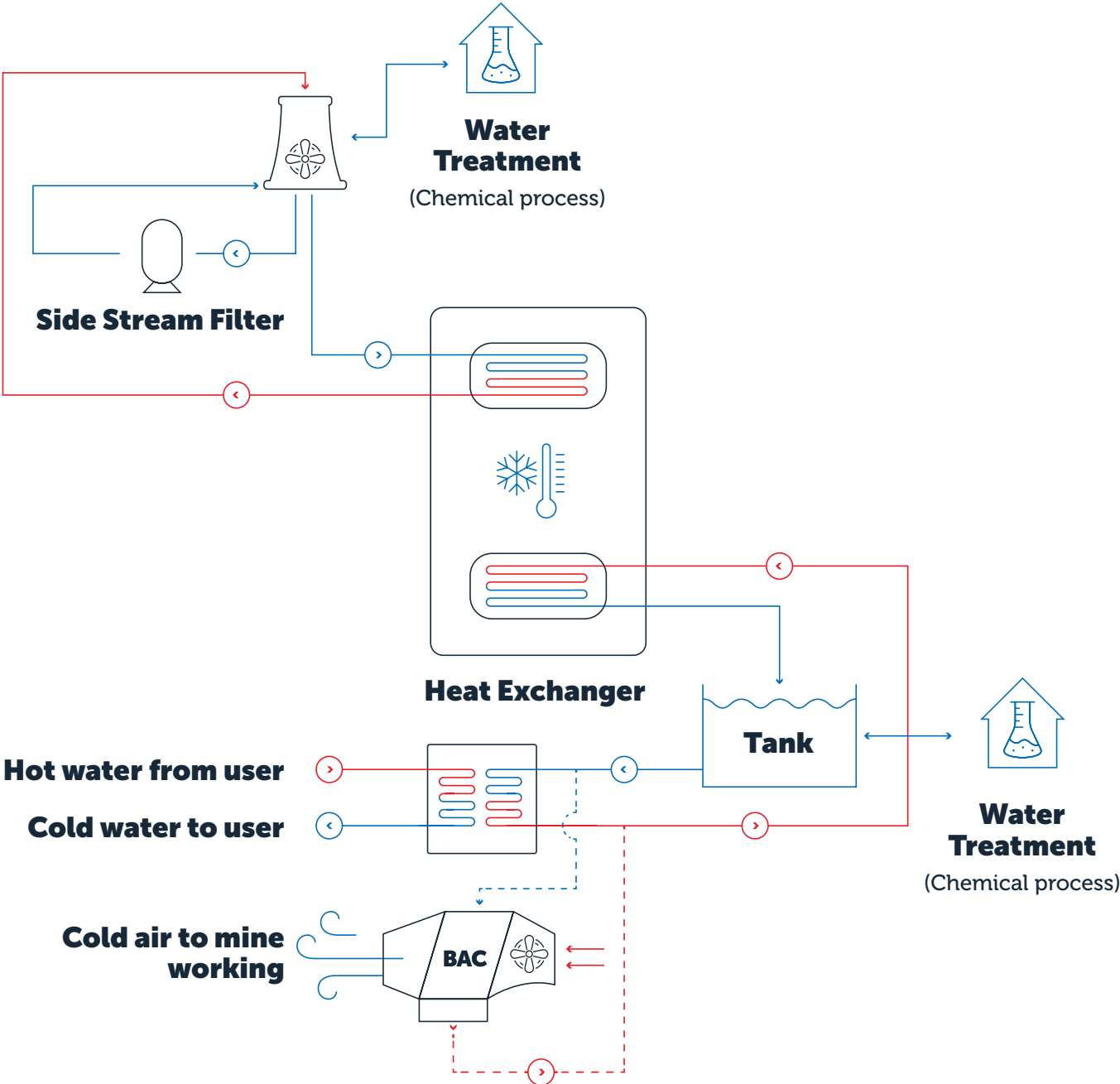


04 Spares & Accessories

Cooling tower parts and components e.g. fill, drift eliminators, nozzles, fans and drives. Air fin coolers and condensers as well as the supply of associated equipment and spare parts.



Engineered Thermal Solutions



Cooling Towers



We have completed approximately 80% of all the natural draft cooling tower refurbishments in Southern Africa and are deemed by many to be Africa's leading cooling tower specialist.

The IWC range of cooling towers has proven itself to be one of the most efficient and reliable in the world. Each cooling tower is analysed and designed by our engineers who collectively, have over a century of experience in this field.

Our flexible approach to designing customer centric solutions considers fan power, pumping head, plan area, water quality and environmental considerations to ensure the best possible solution. Our engineers review each cooling tower application to assure that the components selected will work together as an integrated system, for both efficient performance and a long, reliable operational life.

Our primary goal is customer satisfaction, and we achieve this by providing bespoke cell sizes to solve particular requirements. Our design engineers select from a number of possible cooling tower component combinations that result in economical selections, capable of the thermal performance required.



80%

**of all refurbishments in
South Africa completed by us**



30+

**years pioneering
cooling technology**



Field Erected Cooling Towers

Recognised as the market leader, IWC has constructed numerous cast in situ cooling towers. Our field erected towers are constructed in various materials from concrete, to steel and wood. Other field erected towers include pultruded towers built from glass reinforced polyester plastic.

Concrete is a natural material which is ideally suited for long service life in the harshest environment and defies the detrimental effects of heat and ultraviolet light. IWC has an impressive installed base of cast in situ concrete cooling towers, across a number of different industries and countries.

Pultruded GRP towers are built from pultruded fiberglass profiles and are the best possible solution for long term use in corrosive environments. Our pultruded GRP cooling towers are designed according to specific project specifications and conform to CTI STD-137 & CTI STD-152 standards. Due to Glass Reinforced Polyester (GRP) unique properties, pultruded GRP is becoming the industry norm for the construction of large field erected cooling towers and owners and operators can benefit from long service life of cooling towers constructed from pultruded GRP. Construction durations are also reduced as well as the initial capital cost. These cooling towers can be rapidly deployed to remote project sites and assembled with limited skills, plant and equipment.

Wooden, galvanised and stainless steel, have been the de facto standard material for cooling towers for many years but GRP towers are now favoured. The "traditional" galvanized metal cooling towers are somewhat notorious for being maintenance intensive and requiring frequent replacement due to pH problems, corrosion, leakage, high maintenance costs, and sporadic disruptions.



Package Cooling Towers

With over 14 000 units in the field, we are the leading cooling tower manufacturer, having an extensive range of package cooling towers for all applications and industries.

A comprehensive range of spares are kept on hand to assist customers at short notice. Our cooling towers have long been the benchmark against which other cooling towers have been compared.

Our range includes:

- EWK Cooling Tower range – produced in our factory for use in small to medium size applications. Manufactured in robust, durable glass reinforced polyester casing.
- FM Cooling Tower range – produced in our factory for use in medium to large size applications. Multi-fanned and manufactured in a 3CR12 or stainless frame. The casing consists of glass reinforced polyester side sheets and glass reinforced polyester fan casings
- PLT Cooling Tower range – custom built towers for use in medium to large size applications. The PLT cooling tower is made up of a glass reinforced polyester frame, side sheets and glass reinforced polyester fan casings.

The IWC range of cooling towers has proven itself to be one of the most efficient and reliable in the world. Each cooling tower is analysed and designed by our engineers who collectively, have over a century of experience in this field.



Bulk Air Coolers

Undoubtedly, the biggest challenge of deep level mining is providing a safe environment for miners. Today, gold and platinum mines descend as far as 4km below surface. In this extreme environment, virgin rock temperatures often exceed 60°C, requiring sophisticated cooling methods and equipment to reduce temperatures to safe levels for miners to work in.

Due to the extreme environment, underground mining operations make use of some of the largest ventilation and cooling systems in the world, incorporating more than one type of cooling technology, such as evaporative condensers, mechanical refrigeration plants, pre-cooling towers and bulk air coolers, in order to ensure a safe mine temperature.

IWC, has been at the forefront of developing ventilation and cooling system technology in the mining industry for over 30 years. Recent projects include manufacturing and installing these systems into the world's biggest mining corporations, including Roxgold Platinum Mine in Burkina Faso.



Slurry & Solution Cooling Towers

IWC has developed a field erected cooling tower specifically designed to handle slurries as well as highly abrasive and/or corrosive solutions.

These cooling towers are designed with ease of maintenance in mind, and have forced draught fans, removable spray lances (accessible from an external walkway) and are fill-less, making them ideally suited for applications where fouling of the internals would normally be a major operational concern.

Drift eliminators are assembled into easily removable pads and can be provided with an automatic CIP (Cleaning In Place) system. Drift losses have been minimized and drift losses can be reduced to as low as 0,002% of the re-circulating solution flow rate. The cooling tower is typically octagonal in shape and consists of a number of field-assembled, dual composite GRP panels, complete with an integral basin which is designed to be non-clogging. The structural panels have integral polypropylene liners with the structural laminate produced from a high-quality vinyl ester resin. A conductive carbon tissue is included as a corrosion barrier, as well as to allow for spark testing of the internal polypropylene panel seal welds.

Heat Exchangers

IWC offers a comprehensive range of plate type heat exchangers for numerous applications. We also provide a range of spare plates and gaskets for most brands of exchangers.

Semi and fully welded plate type heat exchangers

The thermal efficiency in a welded heat exchanger is comparable to a traditional gasketed plate heat exchanger. We are able to provide solutions within this range of heat exchangers, from plate and shell and square block heat exchangers, semi-welded plate heat exchangers, pillow plate heat exchangers and fully welded plate heat exchangers. For all these types, plates are laser welded together to form a plate pack, which is then mounted inside either a traditional cylindrical shell for the plate and shell heat exchanger or bolted together in a frame for the other types. Compared to shell and tube heat exchangers, welded units take up significantly less space and when exotic materials are required for the application, these units are significantly cheaper than the shell and tube heat exchangers.

These units can operate with temperatures from -100°C to 400°C and with design pressures of up to 40 bar. These heat exchangers can be used to cool aggressive media and applications include mining processing, petrochemical, pulp and paper, steel and sugar industries.



Gasketed plate heat exchangers

Gasketed plate heat exchangers are used in many processes in all kinds of industries. Auxiliary cooling at a power generation plant, wort cooling at a brewery or an ammonia evaporator to produce chilled water for mineshaft cooling, are all applications done by plate type heat exchangers. Plate heat exchangers are available with single, semi-welded, free flow or fully welded plates.

Plates are bolted together in a plate pack with each plate sealed to the next by means of a gasket or a laser-weld. Plate and gasket materials are carefully selected for the application in which the heat exchanger will operate.

Spiral plate heat exchangers

Circular in design with two spiral channels; each one is a closed chamber allowing two media to remain separate while heat exchange occurs.

The flow of the two products is usually counter-current, which results in a close temperature approach between the two media. A variety of fluids/vapours can be circulated through this type of heat exchanger, including liquids containing solids and fibres, waste water and slurries to name a few.

The heat exchanger surface is easy to clean and maintain with its optional removable bolted covers that can be mounted with hinges to easily open allowing access to the internal spiral chambers.

Copper or nickel brazed heat exchangers

Brazed plate heat exchangers consist of a number of thin (0.3mm), stainless steel plates, precision stamped and assembled as a unit. The plate pack, assembled with two end plates and connections, is vacuum brazed at extremely high temperatures providing a permanently sealed heat exchanger.

The brazing ins mostly used with a copper alloy but in some instances, where copper is not allowed, nickel can be used as a brazing material.

This results in an efficient unit which gives a space and weight saving of up to 80% compared with a tube heat exchanger. These plate heat exchangers are suitable for applications requiring high temperatures and pressures. Brazed plate heat exchangers do not contain rubber gaskets and can therefore operate continuously at extreme temperatures from -180°C to 200°C with operating pressures as high as 30 bar.

Applications where these heat exchangers are an effective solution include heating and ventilation (for solar heating and air-conditioning units), heat pumps, heat recovery, and hydraulic oil units.

Hybrid air coolers

Hybrid air coolers offer outstanding performance potential thanks to the combined effect of both wet and dry cooling.

The hybrid air cooler has the following design features:

- Parts in contact with water are produced from stainless steel

- Fans selections are optimized to reduce noise pollution and energy efficiency
- Fans have continuous speed control to reduce energy consumption
- Automatic functions include draining, biocide addition, conductivity measurement and blowdown

We offer the following options for the hybrid air coolers:

- Cathodic dip-paint coating provides superior protection against corrosion
- Complete electrical control cabinet with control system to regulate summer/winter modes, adjustment of fan speed, control for the deluge system and automatic blow down and make up.

Air fin coolers and condensers

IWC offers a complete range of industrial air fin coolers and condensers to cover a wide range of performance parameters.

The range of air fin coolers we offer have the following specifications:

- Finned heat exchanger coils are provided with either copper or stainless steel (304 or 316) tubes configured with a staggered arrangement for efficient heat transfer.
- Fins are fabricated with a number of options such as aluminium, ALMg, epoxy-coated aluminium, cathodic dip-paint coating or copper.
- The air fin coolers have casings manufactured from powder coated galvanized steel with 316 stainless steel as an option.

Refrigeration



Engie Refrigeration Quantum Chillers

IWC represents ENGIE Refrigeration in South Africa and through our partnership, we are able to provide the right cooling solution for data centre and HVAC applications requiring a minimum cooling capacity of 750kW.

After years of continuous development, the QUANTUM is now a chiller that provides an astonishingly broad range of services. This series of high capacity chillers offer impressive solutions for each refrigeration application and can be individually tailored to ensure that every customer gets exactly the refrigeration they require.

It is the underlying concept of an oil-free compressor and contact-free magnetic bearings that make the QUANTUM chiller so powerful and efficient. There is no material wear, significantly lower maintenance costs and all the regulations and precautionary measures associated with oil operation simply do not apply. Another advantage of oil-free operation is more efficient heat transfer (in the condenser and the evaporator), which is not impaired by oil. This increases efficiency and reduces operating costs.

However, it is not just the QUANTUM's long-lasting refrigeration and environmental credentials that impress, it's also the reduced energy costs. It is also exceptionally easy to operate. It begins with a staggered start-up of the individual compressors, thereby resulting in low start-up currents, among other things. Then it switches over to quiet and low-vibration operation. QUANTUM's continuous power control eliminates in-efficient pulsing behaviour in the compressors, ensuring highly constant temperatures.

The Quantum chiller range is available in either water cooled or air-cooled versions. 50% Lower operating costs:

- High-efficiency compressors > no friction losses thanks to magnetic bearings
- Each compressor is fitted with a frequency converter > maximum efficiency during partial load
- Heat exchangers with high-performance ribbed pipes > optimum heat transfer with minimum pressure loss.



50%

Lower operating cost



Water Cooled

The water-cooled QUANTUM was developed for process cooling in HVAC applications where efficient refrigeration is required despite the climate.

Advantages:

- Maximum energy efficiency
- Soft start up
- Minimal noise and vibration
- Reduced CO2 emissions
- Operational safety.



Air Cooled

At 2 megawatts, it is the most powerful air-cooled chiller of its type on the international market – and it works more intelligently than all other models currently available: the new QUANTUM Air.

Advantages:

- Energy-efficient and environmentally friendly
- Minimal noise
- Lightweight and compact
- Suitable for numerous areas, e.g. data centres, hospitals or office building

Quantum Water cooled chiller					Quantum Air-cooled chiller
Series	W Series	P Series	B/X Series	G Series	Quantum 4.0
Type	W050 – W385	P440 – P750	X030 – X270	G030 – G400	A0230 - A1900
Cooling capacity (kW)	400 - 3850	4000 - >6000	250 - 2850	250 - 4000	250 - 1800
Condensing temperature max. (°C)	43	43	57	57	Up to 52°C ambient temperature with the TTH compressors
Number of Compressors	1 - 6	6 - 10	1 - 6	1 - 8	1 - 4
Refrigerant	R134a or R513a	R134a or R513a	R134a or R513a	R1234ze	R134a or R513A or R1234ze



Spares & Accessories

IWC has been active in the refurbishment of cooling towers for the past three decades and our turnkey solution ensures your plant runs optimally at all times. Since 2015, we have also been active in offering a full service program for Plate Heat Exchangers and Shell & Tube Heat Exchangers.

We offer a comprehensive range of spares and accessories for all cooling tower types, as well as a range of spares for most brands of Heat Exchangers.



Fan Rotating Assembly

IWC supplies a range of fans and fan equipment to retrofit almost any cooling tower or air cooled heat exchanger.

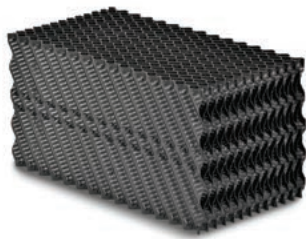
Our standard fan arrangement comprises an axial flow fan having either fiberglass or aluminium fan blades, right angle reduction gearboxes, steel, stainless steel or carbon fibre composite drive shafts and electrical motors supplied to our customers' specifications.



Fan Rings or Fan Stacks

We provide fibreglass fan rings and fan stacks for both air cooled heat exchangers as well as cooling towers.

These are supplied complete with bell, circular or conical inlets. Pressure recovery diffusers are available as optional equipment.

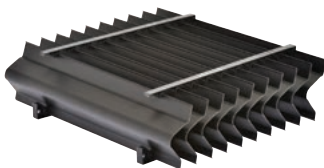


Cooling Tower Internals

We have a comprehensive range of cooling tower fills on offer. Our range of media covers all possible cooling tower operating conditions from very clean to extremely dirty recirculating water.

IWC's team of cooling tower engineers has extensive application knowledge and are able to provide our customers with expert guidance in selecting the most suitable fill medium for their application.

Above fills are typically available in either PVC or polypropylene, with the exception of our splash grid fill that is only available in polypropylene.



Drift Eliminators

A variety of drift eliminators are available depending on customers' emission requirements.

These typically include our S-Type (Large cooling towers), Honeycomb D15 (typical in package cooling towers) as well as a comprehensive range of high efficiency, EUROVENT certified products.



Distribution Systems

We have a range of cooling tower spray nozzles that have been developed by IWC specifically for use in both large concrete cooling towers as well as in package cooling towers.

These include our successful full cone square pattern sprayers and our low pressure upward and downward gravity pressure nozzles.



Industrial Water Cooling (Pty) Ltd

55 Lake road
Longmeadow Business Estate North, Edenvale, 1609
T +27 (0) 11 466 0699 E mail@iwc.co.za W iwc.co.za