

Leading Designer and Manufacturer of  
Heat Exchangers, Finned Tube  
and Associated Equipment



Spiro-Gills Thermal Products Limited was established in March 2008 following a management buy-out from Spiro-Gills Limited (prior to that GEA) and Spiro-Gills Products Limited.

Our corporate aim is to continue the high quality manufacture of Air Cooler products, repairs, re-tubing and upgrading.

With more than 50 years experience (encompassing GEA Airexchangers Ltd, APV Spiro-Gills Ltd & Stafford Fabrications Ltd) in the design and fabrication of all major process cooling components, including finned tubing, headers, plenum chambers, fan rings, bundle frames and structure, we are able to offer customers an unparalleled guarantee on the thermal and mechanical performance of our equipment.

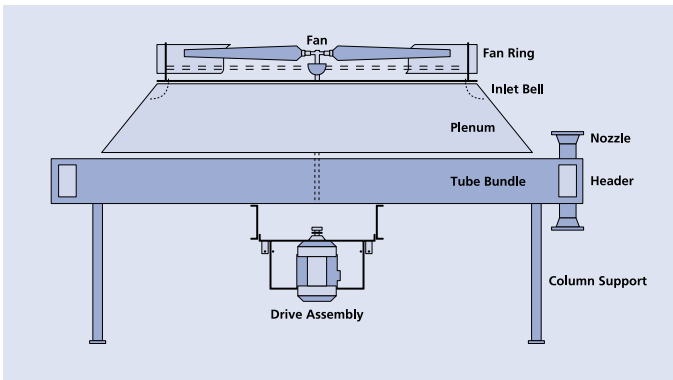
It is always our ambition to exceed our customers expectations.

# DESIGNING AIR COOLERS

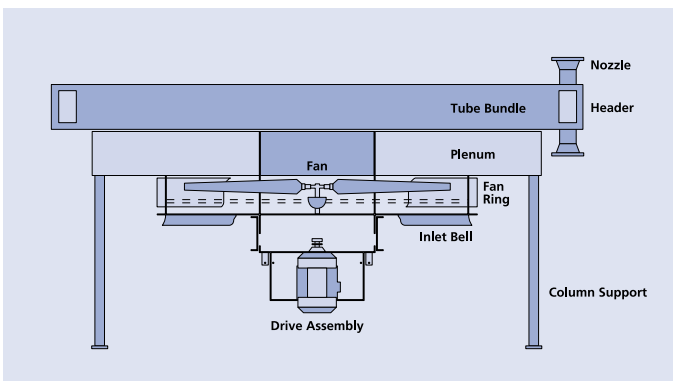
Spiro-Gills Thermal Products Limited makes use of leading-edge technology, including the latest Computer Aided Design systems, to ensure maximum efficiency in:

- Thermal design
- Mechanical design of headers and steel structure
- Noise level predictions
- Preparation of the specification sheet
- Preparation of the general outline drawings
- Preparation of proposals
- Price estimation

## Typical Components of an Air-Cooled Heat Exchanger

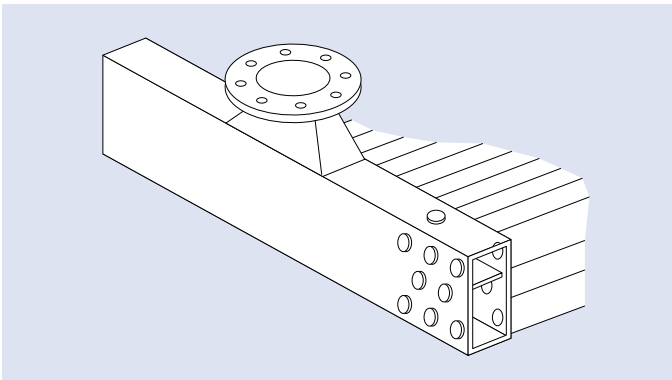


Induced Draft



Forced Draft

## Plug Header

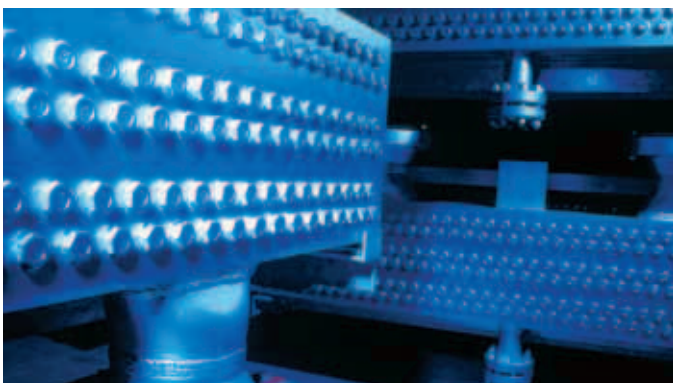


The plug header is the most commonly used header type for working pressures up to 350 bar.

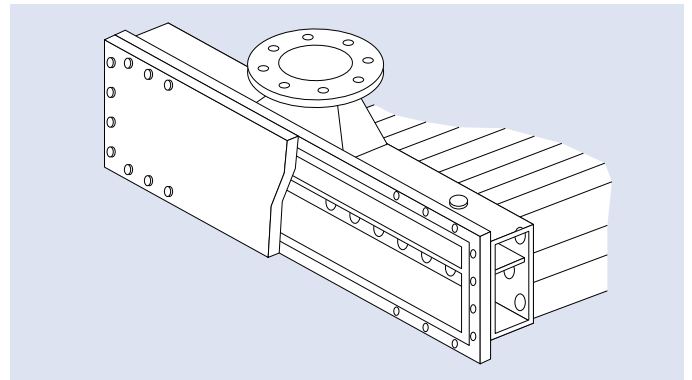
The plug hole opposite each tube allows the tube to be expanded into the tube sheet. It also facilitates mechanical cleaning and plugging in case of leakage.

Seal welded or strength welded tube to tubeplate joints can be provided for hydrogen service at high pressure etc.

This is less expensive than using pipe headers that are generally employed for a service pressure above 200 bar.

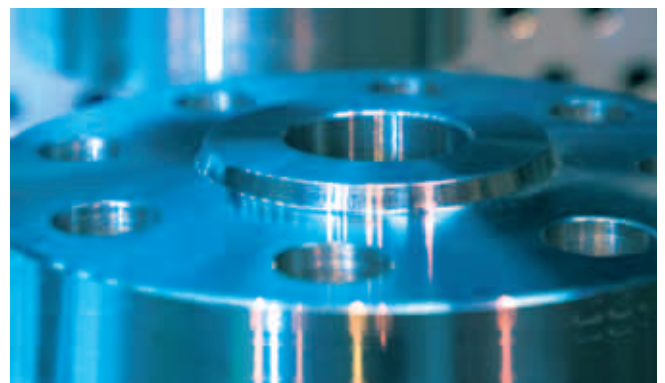


## Cover Plate Header



The cover plate header is used for fluids with high fouling factors up to 40 bar maximum where frequent mechanical cleaning is needed.

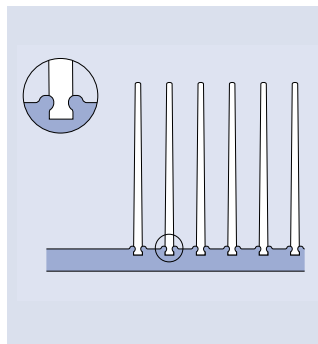
It is also used for highly corrosive process fluids to allow periodic checking of the corrosion allowance.



# CHOOSING THE FINNED TUBE

We supply four types of applied finned tubes, as well as the higher specification extruded tube used for more demanding applications. Fin height, thickness and number per unit length will depend on the requirements of the application and standards needed by the client.

## APPLIED FINNS



**SG-G Fin**  
(Embedded Fin)

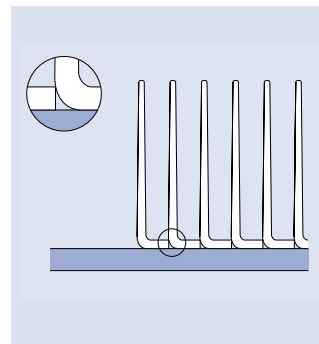
**Application:** High-efficiency fin for high operating temperatures

**Upper limiting temperature:** 400°C

**Manufacture:** A helical groove is formed in base tube displacing of material and fin is wound into the groove under tension followed by backfilling of the displaced material to lock the fin root into the tube

**Fin materials:** Aluminium

**Base tube materials:**  
Any readily machinable material



**SG-L Fin**  
(Wrapped Fin)

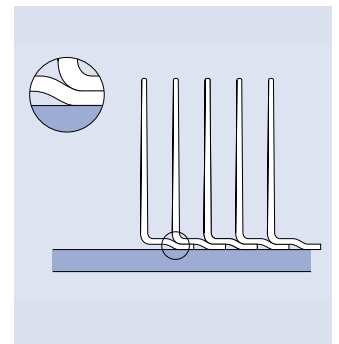
**Application:** Standard fin for low-temperature application where some degree of tube wall protection is required

**Upper limiting temperature:** 120°C

**Manufacture:** Fin foot is pre-formed into L shape and applied to base tube under tension. The adjacent fins abut one another giving a degree of base tube protection for less aggressive environments

**Fin materials:** Aluminium

**Base tube materials:**  
Any metallic material



**SG-LL Fin**  
(Overlapped L Fin)

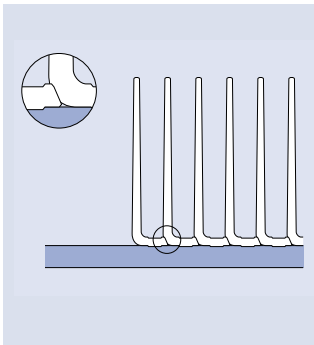
**Application:** Standard fin for low-temperature applications giving increased atmospheric corrosion protection of the base tube

**Upper limiting temperature:** 180°C

**Manufacture:** Fin foot is pre-formed into an LL shape (overlapped LL) and applied to base tube under tension. However, foot is pre-shaped to give overlap of one foot onto another thereby improving base tube protection and thermal contact area

**Fin materials:** Aluminium

**Base tube materials:**  
Any metallic material



### SG-K Fin

(Knurled L Fin)

**Application:** Standard fin for medium-temperature applications, giving increased atmospheric corrosion protection to the outer surface of the base tube

**Upper limiting temperature:** 250°C

**Manufacture:** Fin foot is pre-formed into an L shape and applied to base tube under tension. Knurling tools both precede and follow the laying down of the fin foot so that the fin material is locked into the pre-knurled tube. This gives up to 50% greater thermal contact area than standard L fin and also ensures an airtight fin to tube bond, resulting in greater tube protection

**Fin materials:** Aluminium

**Base tube materials:**  
Any metallic material

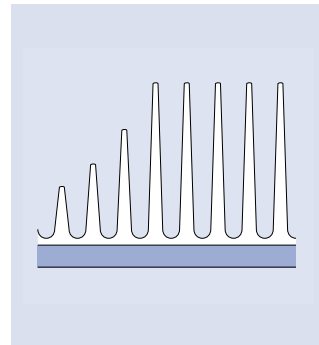
Standard dimensions of applied fin tubes:

**Base tube dia. (mm):** 25.4, 31.8, 38.1, 50.5, 50.8

**Fin height (mm):** 9.5, 12.7, 15.88

**Fin pitch:** 236 to 433 fins/metre

## EXTRUDED FINS



### SG-Extruded Fin

(Bi-metallic Fin)

**Application:** High-efficiency fins for higher temperature applications giving complete and permanent atmospheric corrosion protection of the base tube. Using over 40% more aluminium than the equivalent applied fin the extended fin is very robust and resistant to mechanical damage, allowing the finned tubes to be cleaned without damage using either steam or high-pressure water

**Upper limiting temperature:** 300°C

**Manufacture:** A carefully degreased core tube is fitted into an aluminium primary tube. This assembly is then fed into the triple-spindle finning head of the fin-extruding machine. Three special multi-disc packs extrude the aluminium tube into helical high fins while reducing the inner diameter to give firm pressure contact with the core tube

**Fin materials:** Aluminium

**Base tube materials:**  
Any metallic material

Standard dimensions of extruded fin tubes:

**Base tube dia. (mm):** 25.0, 25.4, 31.8, 38.1

**Fin height (mm):** 15.88

**Fin pitch:** 354, 393, 433 fins/metre

# CHOOSING FANS, DRIVERS AND TRANSMISSIONS

**Fan blades** are made of either aluminium or G.R.P. The number of blades and tip speed depend on airflow and noise limitations. Fans are balanced according to code requirements.

**Belt and pulley** transmissions are used for up to 37kW. Pulleys are dynamically balanced. Belt types are:

- V belt
- Toothed belt (HTD)
- Chevron Belts

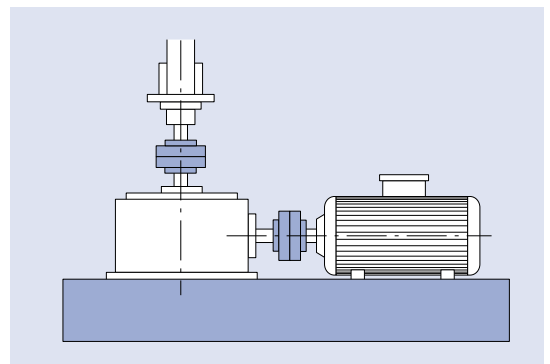
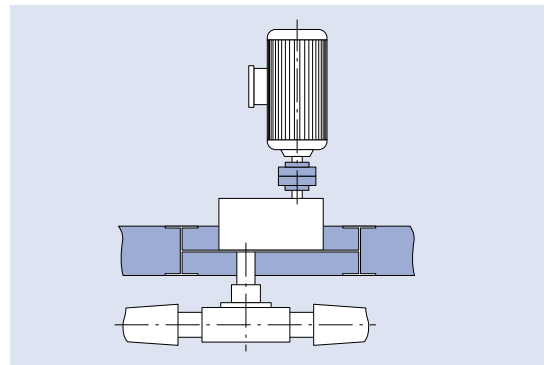
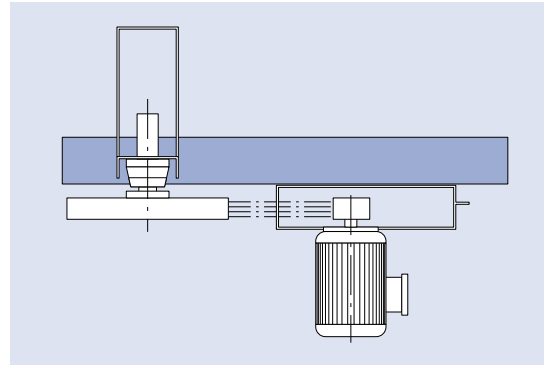
**Gear drives** are generally preferred for over 37kW and are:

- Parallel shaft
- Right-angle drive

**Electric motors** are generally used as drivers. However, steam turbines or hydraulic motors may also be used as well as low-speed direct-drive electric motors.

**Airflow** can be controlled in one of the following ways:

- Louvres (manual or automatic)
- Two-speed electric motors
- Automatic variable pitch fan
- Variable-speed electric motors (variable frequency)
- Steam turbine drivers



# DYNAMIC BALANCING

## Boosting the Efficiency of Fan Coolers – Ensuring Long Life For Your Equipment

To avoid the serious hazards of shortened machine life – or even catastrophic failure – we can arrange dynamic balancing using state-of-the-art equipment.

This specialist service is one of the valuable ways we can help you anticipate problems before a breakdown actually occurs.

Dynamic balancing can be provided at your site for a wide range of rotating machinery – in particular fans, pumps, blowers and similar equipment. Our specially trained field staff are experts in the use of the latest portable microprocessor analyser-balancer machines from I.R.D.

## Dangers of Imbalance

Imbalance has been found to be one of the commonest causes of vibration generating powerful forces which may prove dangerous for the lifespan of the equipment. Imbalance can be defined as the unequal distribution of the weight or mass of a rotor about its rotating centreline. Although analysis of vibration data can highlight the presence of rotor mass imbalance the problem can only be corrected through the specialised technique of dynamic balancing.

## What is the Cause?

Assuming a good state of balance has been achieved during manufacture the likeliest causes of imbalance developing during service are:

- Build-up of material deposits on rotor blades
- Erosion of rotor due to abrasive dust burden
- Uneven wear due to corrosion
- Distortion due to excessive heat
- Impact damage from a foreign body
- Bent shaft
- On-site repairs to any – or all – of these problems

## If you think you have a Problem...

If you have any doubts about your equipment, please call us – we can offer rapid, expert diagnosis.

It is **dangerous** to ignore the warning signs!

Remember that the centrifugal force created by imbalance actually increases by the square of the rotor rpm. This means that, at speed, a small amount of unbalanced mass can be transformed into a huge – and potentially disastrous – weight.

# REFURBISHMENT/RE-TUBING

Many repairs – including the complete re-tubing of tube bundles are offered. Our preference is to re-tube/refurbish in our own workshop where the work can be carried out under factory conditions. Where this is not possible in-situ repairs can be arranged.



# UPGRADING

Spiro-Gills Thermal Products Limited offers valuable expertise to operators who are considering an upgrade. This can often be the solution when process demands have outstripped the original specification and the space or funds are not available for a new installation.

Our thermal and mechanical assessment will establish the best and most cost-effective upgrade within the limitations of your budget – our vast experience with fans, drives and other aspects of air-cooled heat exchanger technology can make this a surprisingly successful option.

Existing fans are often old, noisy or obsolete. By applying the correct engineering solution and using an updated drive with increased power electric motors an outdated cooler can be modified to cope with a higher heat load while still meeting the ever more stringent industry standards for noise and vibration levels.





# COOLING SYSTEMS

Spiro-Gills Thermal Products Limited has a wealth of experience in designing and manufacturing air cooled heat exchangers for a multitude of cooling applications. Our extensive experience includes, but is not limited to, Process Coolers, Power Generation Cooling, Transformers, Condensers and many more.

Our coolers are designed to meet the most onerous worldwide environments on sites from the Arctic to the Equator. Design and construction incorporate materials that ensure long and trouble-free service with a minimum of maintenance. The heat transfer surfaces are selected from Spiro-Gills' extensive range of finned tube systems and are optimised to suit the application in the most cost-effective manner.

We employ a team of thermal engineers with extensive experience in solving the kind of problems likely to arise in this area of operations.

## Quality Control

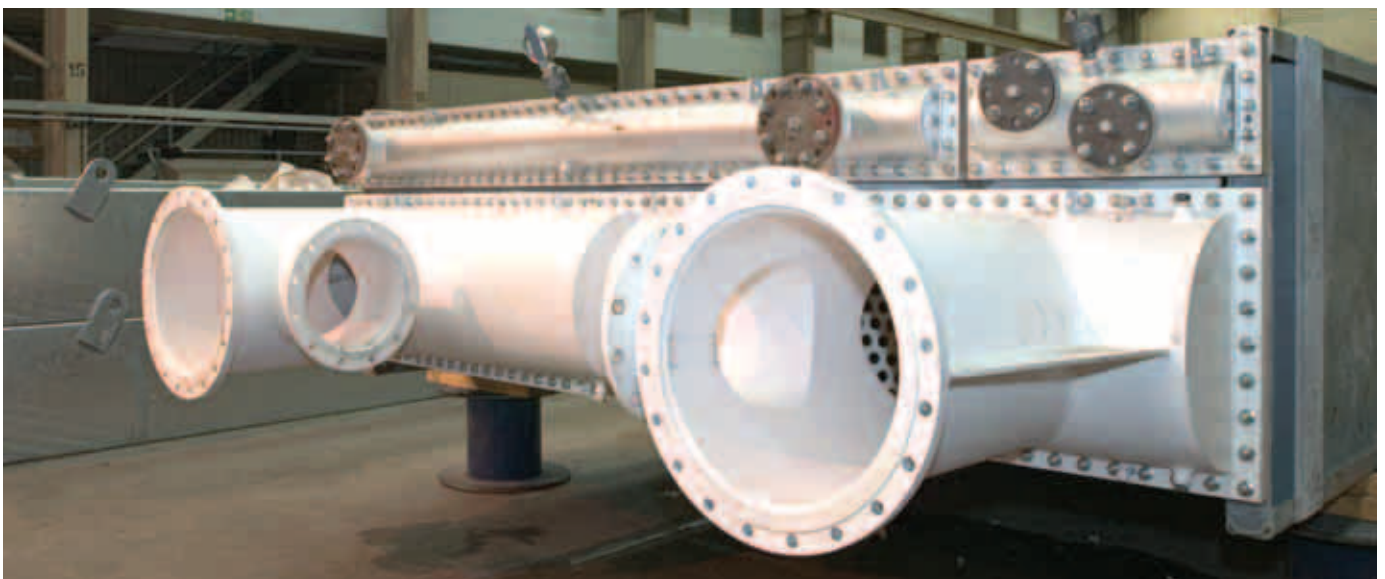
We have achieved full qualification to ISO 9001: 2000 in all stages of design and manufacture.

## Rigorous Testing

We ensure all tube bundles are subject to thorough hydraulic tests appropriate to the cooling medium employed. We also have individual test rigs for transformer oil, turbine lubricating oil and water. These rigs incorporate flushing, filtration, flow and pressure loss measurement.

Every fan supplied as an integral part of our equipment is tested to ensure there are no inherent vibration problems, and that it complies with the appropriate specifications. In addition, noise levels can be measured if required.

Comprehensive certification is issued covering all stages of inspection and test.



## FINNED TUBES

---

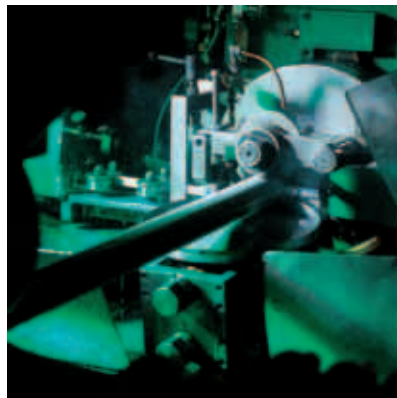
Spiro-Gills Thermal Products Limited is the only UK company to manufacture Welded, Applied and Extruded Finned Tubes, Spiro-Gills has the ability to manufacture high-specification tube from 25mm to 219mm diameter for uses in Process/Engine Coolers, Boilers and Furnaces.

Using Spiro-Gills to manufacture your finned tubes will guarantee that you receive a high-quality product, delivered on time at a highly-competitive price.

Welded Finning Machine



Applied Finning Machine



Extruded Finning machine

