Rotary heat exchanger elements are frequently exposed to very severe fouling and corrosive conditions. High quality acid-resistant vitreous enamelling provides effective resistance to these hazards and Howden works closely with specialist suppliers to offer coatings of the highest quality.

Air preheater elements, particularly those in gas-gas heaters for flue gas desulphurisation applications and on boilers firing high sulphur fuels, oil or coal, are subject to extreme attack from fouling and corrosion. Under such conditions, the absence of protection, or enamelling of a poor quality, can lead to serious corrosion or failure.

Even when used in less hostile situations, the use of enamelled elements has become preferred because of the low adhesion properties they offer, making them easier to clean. The cleanability advantages are clearly seen in applications downstream of a Selective Catalytic Reduction process to reduce NOx emissions. Excess ammonium injection results in ammonium bisulphate condensation at higher temperatures in the heater. In this case the enamelled cold end elements can be very deep.

Howden use only the most advanced dry electrostatic coating methods, using a range of specially-developed enamel frits to match the properties of the coating to the requirements of the application, using decarbonized steel, Mild Steel or LACR (Low alloy corrosion resistant steel) as a substrate. The frit powder is robotically applied by electrostatic spray and then the elements are subjected to a computer-controlled baking process in which the frit is vitrified to create an extremely hard smooth surface.

We conform to all appropriate quality assurance standards and the finished product meets, and in many aspects, exceeds EN28763:2011 for enamelled elements.
Key features
Electrostatic coating produces uniform coating thickness.
Exceptionally good coverage of plate, including edges.
Low porosity.
Very high corrosion resistance.
Excellent bonding between steel substrate and enamel coating.
High resistance to mechanical and thermal shock.
Excellent resistance to erosion and wear.
Smooth surface minimises adhesion of solid particles, greatly improving cleanability.
Environmentally friendly production process in state-of-the-art purpose built factory.
Suitable for high-pressure packing.

Enamelled surfaces and high-pressure packing
Where the basic element profile is not optimised for high-pressure packing, the packing process and the forces involved can cause local damage to enamel coatings. On the other hand, low packing pressures lead to vibration and fatigue during steam sootblowing, shortening service life.

The Howden developed SurePack Elements™ involve the use of computer controlled presses to ensure that the specified packing pressures for all elements are achieved before the basket is welded. As part of the QA system, packing details are recorded for every basket produced.

This SurePack technique is even more critical for enamelled elements to ensure that the optimum ‘tight pack’ compression is achieved without damage to the enamel and goes beyond conformance with the packing requirements of EN28763:2011.

The use of SurePack Elements™ baskets maximises the service life of Howden enamelled elements.