Made in Italy
Since 1951

HEAT EXCHANGE MASTERY

BULK SOLID HEAT-EXCHANGER

BSHE

BULK SOLID HEAT EXCHANGER

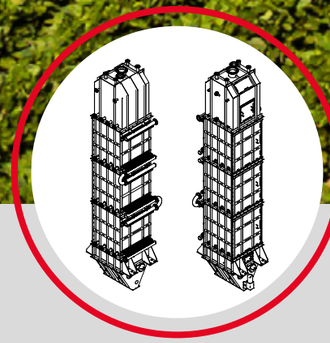
A COMPLEX PROCESS

Industrial heat-transfer processes for granulates are always and generally complex and energivorous, this due to the physical-chemical properties of the product to be thermally treated.

In some specific cases there are even additional issues to solve whom it needs peculiar solution and with traditional heat-transfer equipments this means high costs and problems for the process control, thus affecting the whole plant performances and efficiency.

EXPERIENCE

Thanks to its decades of experience in the indirect heat-transfer processes for several application and situations, FIC has finally optimised and made accessible to a wide range of users in various industrial sectors a technology able to provide convincing and decisive answers.

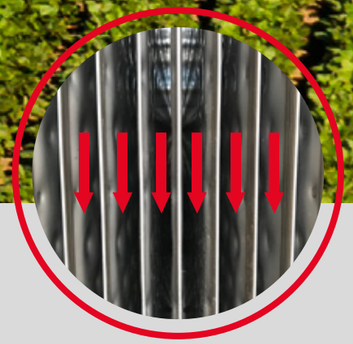


OWN DESIGN

With the Bulk Solid Heat-Exchangers (BSHE) conceived, designed and manufactured entirely by FIC it is possible to achieve optimal results to cool, heat and dry granular solid products of various nature and characteristics, being able to operate within a wide range of temperatures, with different construction materials and in different working conditions.

TRAPCOLD PILLOWPLATE

The BSHE by FIC use the Trapcold® pillow plate as the basic element for the heat transfer; the plates are assembled in bundles / batteries, in single modules and the vertical tower construction allows a modular and compact construction; the number of plates per module and their dimensions are determined according to the capacity that the heat-exchanger must guarantee. **Thanks to this concept, the single exchanger is 100% designed according to the specific needs of the individual process but can also be easily modified, integrating other modules in the event of an increase in the production capacity of the plant.**



INDIRECT HEAT TRANSFER

The BSHE by FIC combine in a highly efficient way the principles of granular product flow by gravity and the indirect thermal exchange. In this way optimum residence times of the product are achieved in the heat-exchanger but with relatively small dimensions, combined with the absence of impacts and stresses or contact with potentially polluting and harmful agents or components.

SEVERAL ADVANTAGES

Compared to traditional systems the BSHE by FIC allow considerable advantages in terms of:

- **energy efficiency**, with savings between 70% and 90%, thanks to indirect exchange

- **emissions reduced to almost zero**, thanks to the absence of air volumes to be mooved and treated

- **absence of contamination and deterioration of the product**, thanks to the constant flow of the product by gravity

- **thermal stability in the product**, thanks to indirect exchange and long residential times in the tower

- **possibility to recover energy from sources available in the plant** at low T that would be lost otherwise

- **reduced installation and operating costs**

BSHE FIC
APPLICATIONS

The FIC's BSHE can be used
for the heat treatment of any type of granular solid:

FIC supports the client to study together the best solution in individual cases and to support it with its own expertise and know-how;

the work-flow develops according to a series of consequential phases:

1

INITIAL AND FUNDAMENTAL PHASE

- Listening to the client, to his needs and his directions
- Data collection, eventual survey on the plant

2

DEVELOPPING STEP

- Identifying of the physical-chemical properties of the product, above all the thermal conductivity, through the data supplied by the customer, data available in the literature, or with laboratory test
- Thermal modeling thanks to FIC specific know-how;
- Possible field tests with pilot plant with a capacity of 0.5 - 2 tons / h of product;
- Collection of definitive data

3

EXECUTIVE PHASE

- Construction of the tower based on the results of the development phase;
- Mechanical tests and inspections
- Delivery of the BSHE

4

FINAL STEP

- Installation of the BSHE on site with the supervision at the erection phase
- Start-up and commissioning
- Training of customers's staff on site

5

OPERATIVE PHASE

- Spare parts availability
- Technical Assistance
- Possibility of remote access

OWN DESIGN & MANUFACTURING

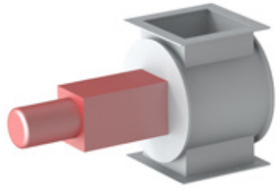
40.000m² Square meters of industrial facilities	**1.500 Tons** Stainless steel processed per year
130 Workers	**> 35 Tons** Lifting capacity
3 Laser Welding Lines	**1** Multispot Resistance Welding Line

The BSHE are entirely manufactured in the FIC workshop to ensure full quality control of the supply, **without delegating to other parties any construction phase and having the continuous and total control of the production process of the exchanger**.

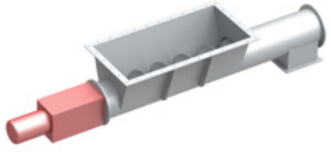
The BSHE can be manufactured in stainless steel AISI 304, 316L, SMO 254, duplex steel and any other steel with higher Ni, Cr, Mo, Ti content.

FEEDING SOLUTIONS

Vibratory Feeder



Rotary Feeder



Screw Feeder

SOME DETAILS MAKE THE BSHE FIC UNIQUE IN THEIR KIND

■ **The flexible connections/ hoses to the plates allow thermal expansion**; they make easier also maintenance activities and the eventual replacement of individual plates. The manifold construction is anyway done to avoid the possibility of ambient air intake in the tower;

■ The welding technology and facility owned straight by FIC, both laser and resistance spot makes it **possible to select the best construction process on a case-by-case basis**;

■ In addition to the BSHE Tower, the scope of supply of FIC **includes ancillary services such as the skids for refrigerant (water) or heating fluids (water, steam, diathermic oil) complete with pumps**, heat-exchangers and control systems or skids for purge air to be fed to the Tower.

■ FIC's BSHEs are also **equipped with temperature and level measuring instruments**, PLC and data logging systems for the complete control of the equipment in each phase of its use.

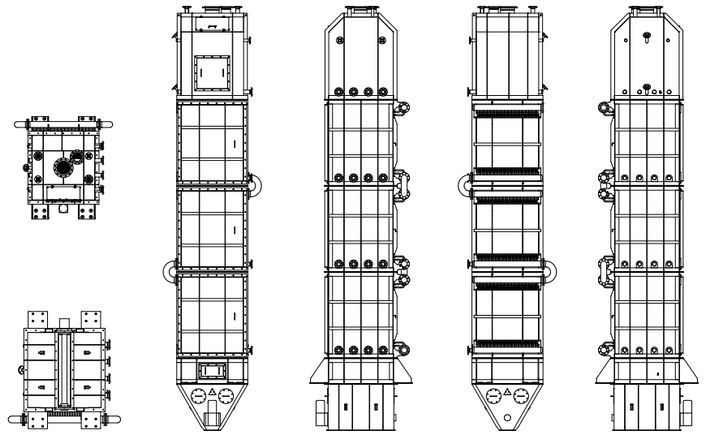
■ **Complete and full access to the individual modules**, thanks to hatches and manways;

■ **Total absence of horizontal surfaces inside the tower**, to avoid the formation of segregation zones of the solid or slump areas that would decrease dramatically the heat exchange;

■ **The choice of feeder to be installed at the bottom section of the tower** according to the process optimization;

■ **The mechanilcal design** that always foresees the F.E.M.

■ **FIC works with a certified ISO 9001 system and designs and manufactures the BSHE according to the ASME and AD2000 codes**, in compliance with the PED / 2014/68 / EU regulations.



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