MAUS ITALIA

Quadrol MRP-EH

Hi-tech hydro-mechanically expansion system
for tube expanders with parallel rolls

Production

Tube rolling system

REV / ENG
01/24

A winning story since 1961

The Beginning

At the end of the 1950s, Domenico Franco Agostino became the Italian representative of Albert Otto, a German manufacturer of tube expanders. In 1961 Franco Agostino's Albert Otto Italiana was founded and in 1972, after purchasing an area of 10,000 square metres in the municipality of Bagnolo Cremasco, Maus Italia Sas was established.

The Growth

In 1976 his son Stefano, a mechanical engineer, joined the company. Together with his father, he studied products, introduced new machinery onto the market and filed the first patents by Maus Italia. Above all, Stefano was firmly convinced that people are the very heart of a company's success. Therefore, he invested in human capital by valuing people and roles, and he surrounded himself with skilled operators as well as technical, commercial and administrative collaborators. The result was a winning, competent and proactive team.
His daughter Anna - also a mechanical engineer - has been working in the company since 2016, giving new impetus and energy to the business her father and grandfather had built.
Father and daughter work together side by side every day to guarantee the excellence of Maus Italia and support all customers worldwide with competence and passion: the company's distinctive traits.

Stefano Agostino
CEO - Mechanical Engineer

Anna Agostino
COO - Mechanical and Management Engineer

In-house production of each component
Workshop 4.0 and 24/7 production control

The production of Maus Italia branded items is entirely carried out in Bagnolo Cremasco, in the heart of an Italian industrial area 30 km southeast of Milan.
The company boasts a 4.0 workshop equipped with state-of-the-art machinery, an in-house heat treatment room and a final inspection department that allow Maus Italia to independently manage every phase of the manufacturing process of its wide range of products whilst maintaining high quality standards.

Quality first.
Design and development

One of Maus Italia's strengths is its willingness to understand its customers' needs.

Our technical department is always ready to find operational solutions to the most complex applications, even via feasibility studies. We develop accurate work processes, draw with FEM analyses to verify our mechanical-structural performance and optimise the manufacturing process of each component.

Ready To Deliver

A well-stocked and complete warehouse of finished products enables Maus Italia ship quickly to customers all over the world according to a ready-to-deliver logic.
The warehouse is fully located within our premises in Bagnolo Cremasco at controlled temperatures and conditions to guarantee the maximum safety and quality of Maus Italia products for all our customers.

Quality, environment and safety policy

Research, quality and safety are the watchwords of Maus Italia Spa.

Maus Italia has several projects underway aimed at increasingly sustainable development and integrates environmental concerns into its business model. The company's actions, behaviour and development choices are focused not only on the short run but rather mainly on a medium and long-term horizon.

MANAGEMENT SYSTEM CERTIFICATION
DNV
ISO 9001 - ISO 14001
ISO 45001

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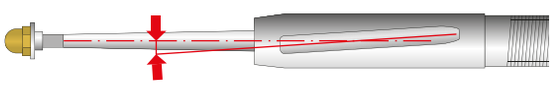
Tube rolling

Comparation between "parallel rolls" tube expansion and traditional "inclined rolls" tube expansion

Traditional tube expanders have a "feeding angle" which, due the friction between the tube and rolls, generates an "auto-feeding" of the conical part of mandrel with the consequent expansion of the tube.
The "auto-feeding" cannot be controlled, therefore it generates stress on the wall of the tube to be expanded.

Traditional tube expander



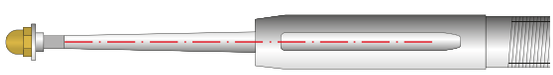
Feeding angle

On the contrary with "Parallels Rolls" tube expanders, the feeding of the mandrel is hydraulically controlled by a system , regulated by the equipment QUADROL MRP-EH.
Since the mandrel feeding speed is controlled (it can be reduced or increased independently from the rotation of the mandrel) the result is high reduction of the stress of the expanded tubes.

The working time is reduced: mandrel feeding speed can be increased during the first part of the expansion and reduced only during the final part of the expansion, once the tube wall thickness is effectively reduced.

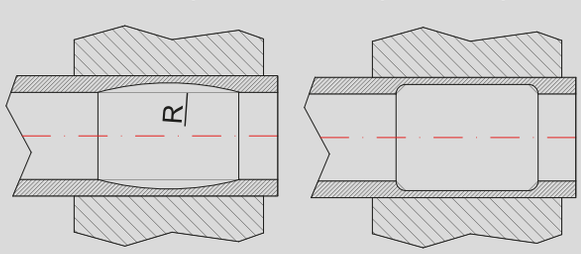
One more advantage of parallel rolls expansion is the reduction of tube elongation (particularly for thin tubes), so, in case of tubes welded to the tube-sheet, it protects the integrity of the weld.

Parallel roll tube expander



With the traditional expansion the expanded area takes the typical "barrel" shape, on the contrary with the parallel rolls, it takes the perfect "cylinder" shape.

"Barrel" shape **"Cylinder" shape**



Parallel rolls expansion advantages

- **High productivity**
- **Quality of the expanded product**
- **Reduction of the tubes elongation (particularly for thin tubes)**
- **Better quality of the contact between the tube and tubesheet by a perfect cylindrical expanded shape in the tube ID**
- **Reduction of residual internal stress**
- **Significant reduction of quantity of required tools**

Quadrol MRP-EH

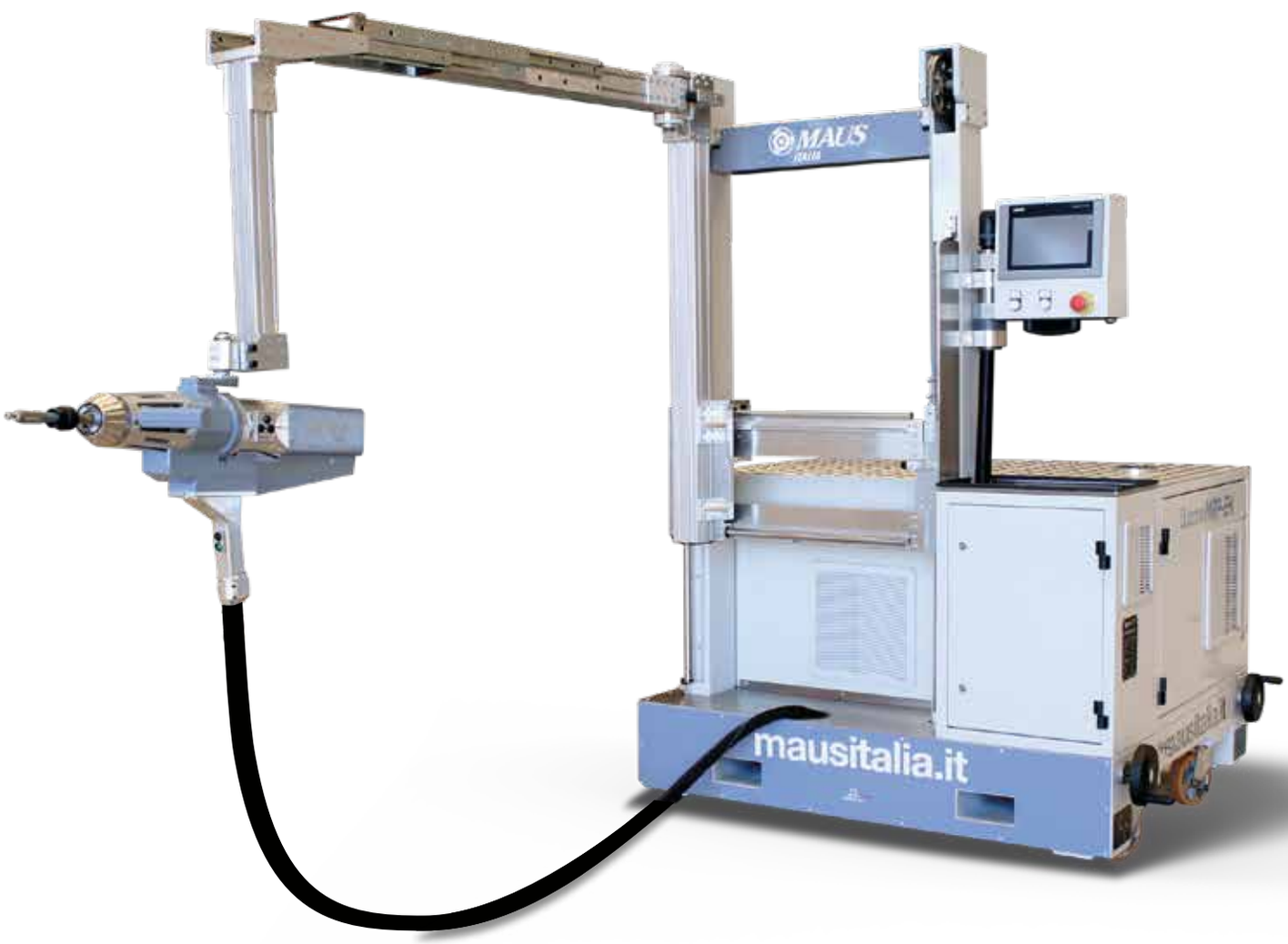
Hi-tech hydro-mechanically expansion system for tube expanders with parallel rolls

This systems is dedicated to expand the tubes wherever it is necessary to minimize tube elongation and its related stress for obtaining a perfect homogeneous contact between tube and tube-sheet along the entire expansion length.

The Quadrol MRP-EH is available in two models:

- ***Quadrol MRP-EH-35*** For external tubes diameter range up to 31,8 mm (1.1/4")
- ***Quadrol MRP-EH-100*** For external tubes diameter range up to 57,1 mm (2.1/4")

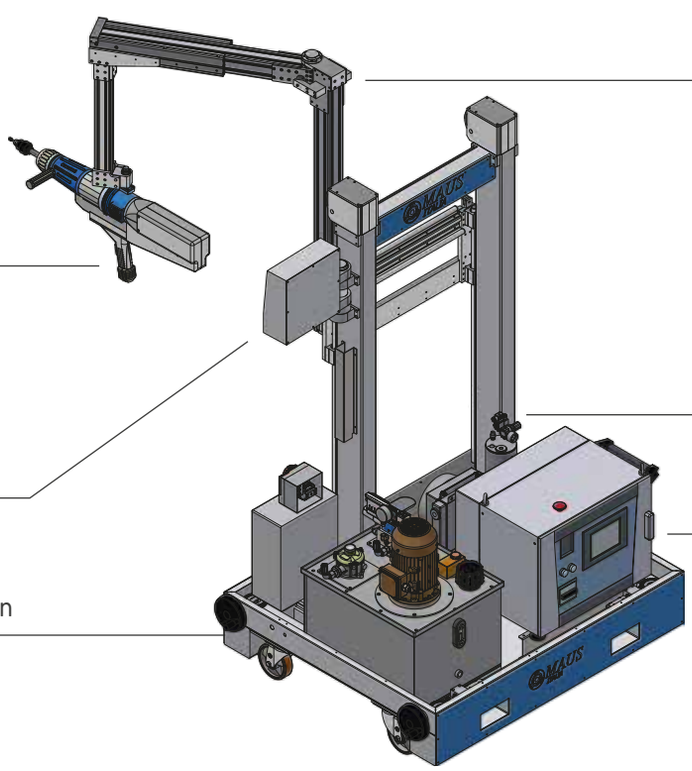
Parallel rolls



Quadrol MRP-EH exclusive features

The ***Quadrol MRP-EH*** system is for tube rolling where a very high precision is needed, the parallel rolls technology also prevent the tube elongation caused during the wall reduction and the relative stress in the tube.

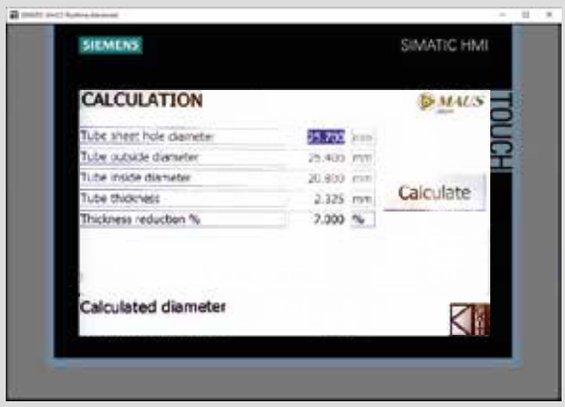
- **Variable speed brushless low voltage motor is installed on the rolling head**
- **Revolutionary dedicated sensor to control the expanded diameter**
- **Possibility to control the mandrel feeding speed directly on the main controller**
- **Articulated arm equipped with "zero gravity system"**
- **Possibility to save the machine setting program on external memory support**
- **Possibility to save expansion data report**



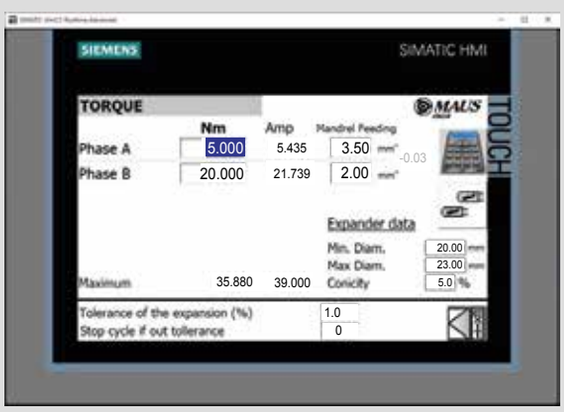
PLC digital control system

The PLC program measures the tube diameter after expansion to achieve an absolute precision of reached tube diameter and the end of rolling process.

Expansion torque value in Nm
Confirmation of reached the torque value
Tube inside diameter reached after expansion in mm

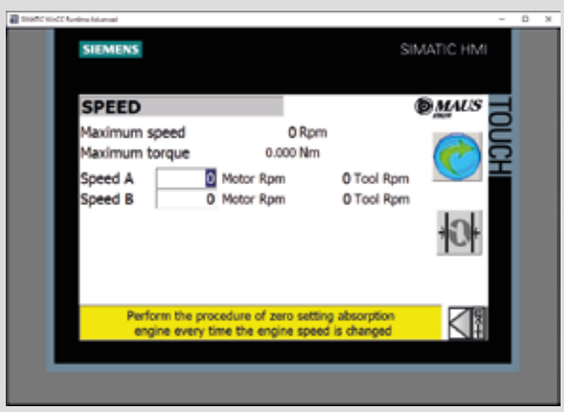


Digital calculation of nominal tube inside diameter after expansion considering the % of tube wall thikcness reduction



Torque values settings:

Expansion torque phase “a”
Mandrel feeding during phase “a”
Expansion torque phase “b”
Mandrel feeding during phase “b”



Speed values setting:

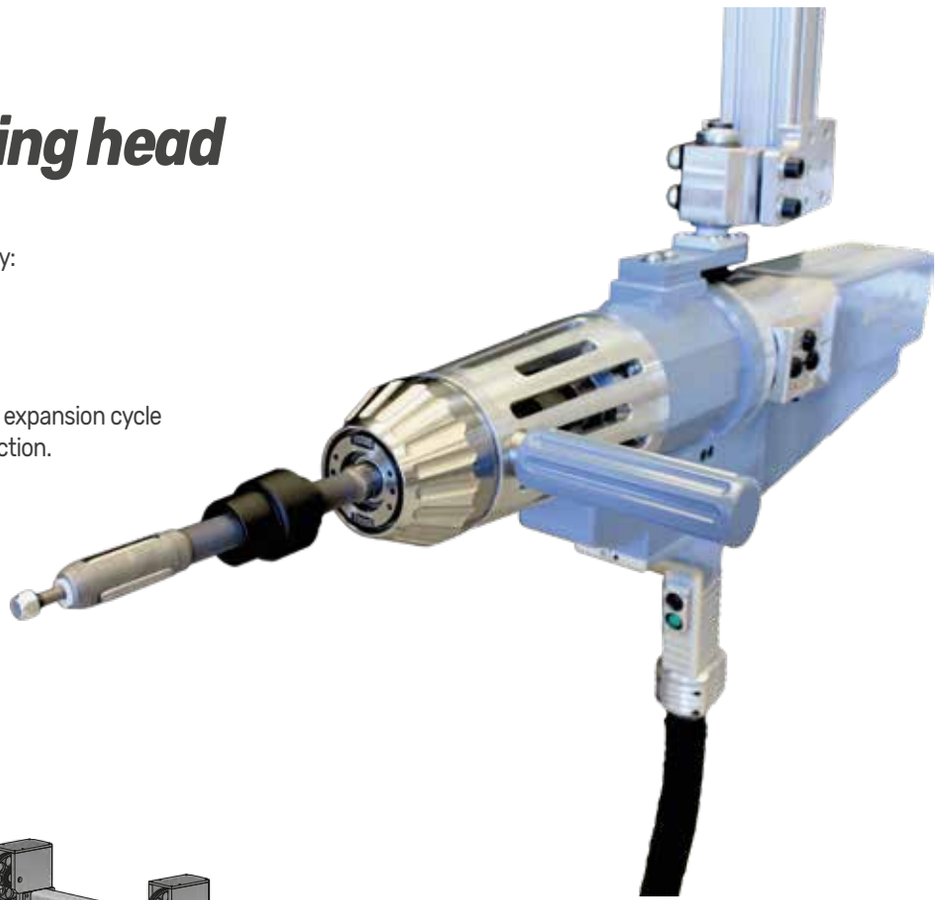
Speed value phase “a”
Speed value phase “b”

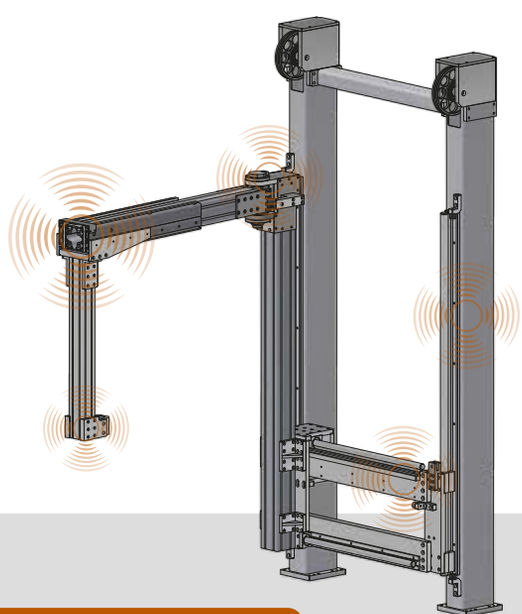
Usefull USB port for data export and saving

Innovative rolling head

The new MRP-EH rolling head is composed by:

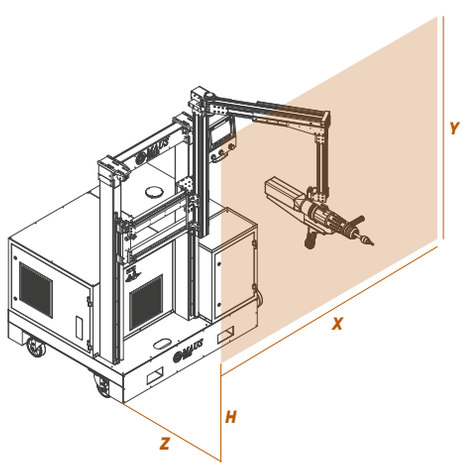
- **brushless rolling motor**
- **hydraulic cylinder**
- linear detector of mandrel position
- **remoted control buttons** for start/stop expansion cycle
- **quick adapter** for tube expander connection.





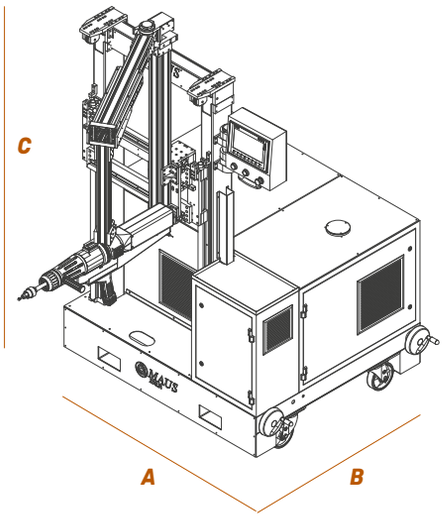
Zero gravity system

The articulated arm supports the weight of the rolling head and absorbs the torque generated during expansion, removing completely the operator effort and increasing the productivity.



Articulate arm working area

X Range	*mm / inches*	1750 / 68.90
Y Range	*mm / inches*	820 / 32.28
H Minimum height	*mm / inches*	780 / 30.71
Z Stroke	*mm / inches*	500 / 19.69



Technical details

		Quadrol MRP-EH-35	Quadrol MRP-EH-100
Voltage	*Volt - Ph*	400-3 phases	400-3 phases
Frequency	*Hz*	50/60	50/60
Installed power	*kW*	5	5
IP		55	55
Rolling head			
Maximum torque	*Nm (Ft.Lb)*	35 (25.8)	100 (73.8)
Max tube outside diameter OD - Ferrous	*mm (inches)*	up to 31,8 (1.1/4")	up to 57,1 (2.1/4")
Motor voltage	*V*	48	48
Rotation speed	*Rpm*	up to 600	up to 600
Maximum mandrel feeding speed	*mm/sec (inches/sec)*	8,0 (0.31)	8,0 (0.31)
Mandrel square drive	*mm (inches)*	9,5 (3/8")	9,5 (3/8")
Hydraulic unit			
Motor power	*kW*	1,5	1,5
Max pressure	*bar (psi)*	120	120
Air connection			
Air pressure	*bar (psi)*	6,3 (92)	6,3 (92)
Air supply connection		Male quick adapter 1/4"	Male quick adapter 1/4"
Dimensions			
Lenght **A**	*mm / inches*	1450 / 57.1	1450 / 57.1
Width **B**	*mm / inches*	1350 / 53.2	1350 / 53.2
Height **C**	*mm / inches*	2100 / 82.7	2100 / 82.7
Weight	*Kg / Lbs*	700 / 1543	700 / 1543
Shipping dimension of the crate			
Lenght **A**	*mm / inches*	1570 / 61.8	1570 / 61.8
Width **B**	*mm / inches*	1480 / 58.0	1480 / 58.0
Height **C**	*mm / inches*	2340 / 92.0	2340 / 92.0
Shipping weight	*Kg / Lbs*	1100 Kgs / 2425	1100 Kgs / 2425

Heat exchanger's world

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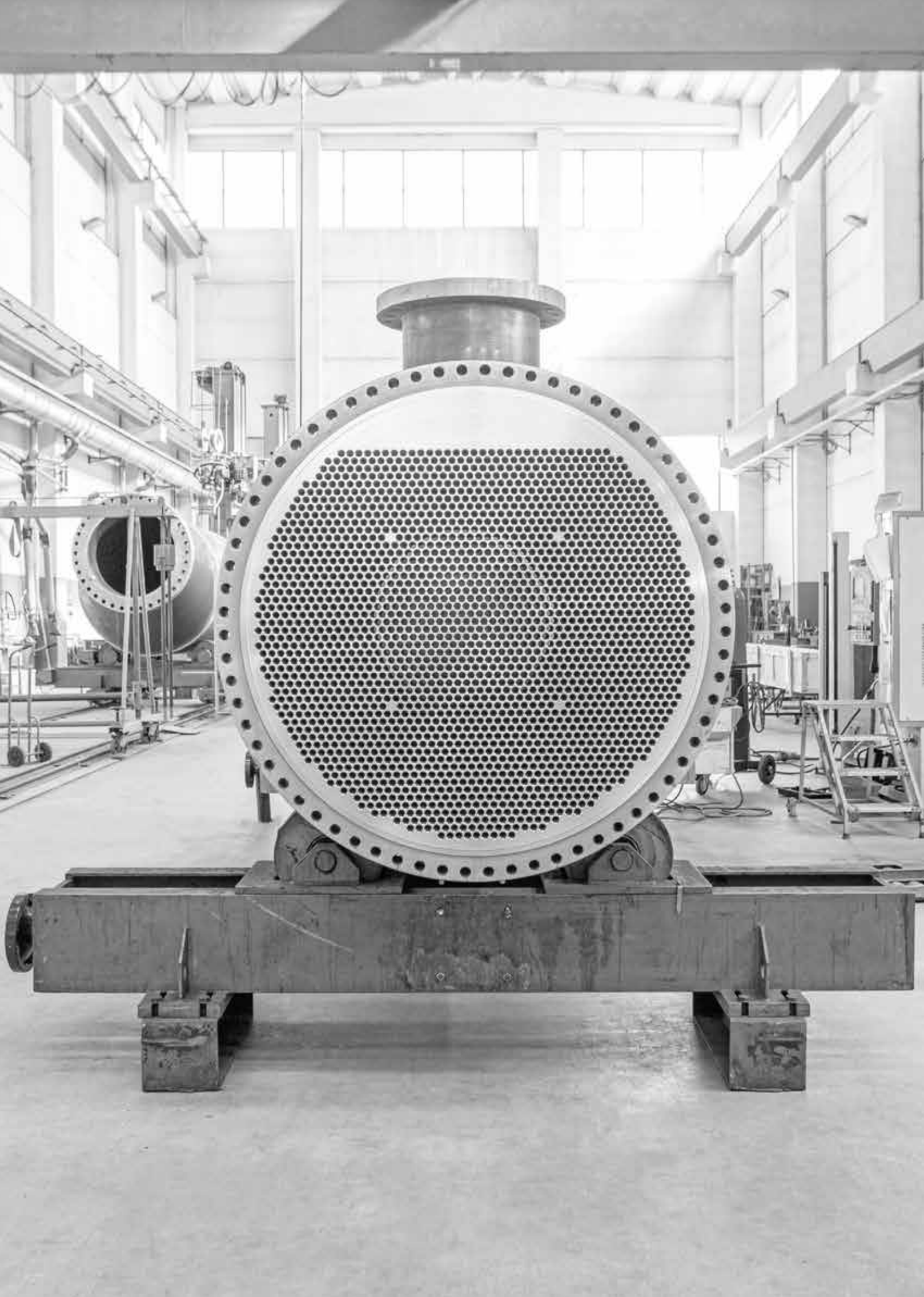

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