

2023
Aviation & Power
Capability & Technology

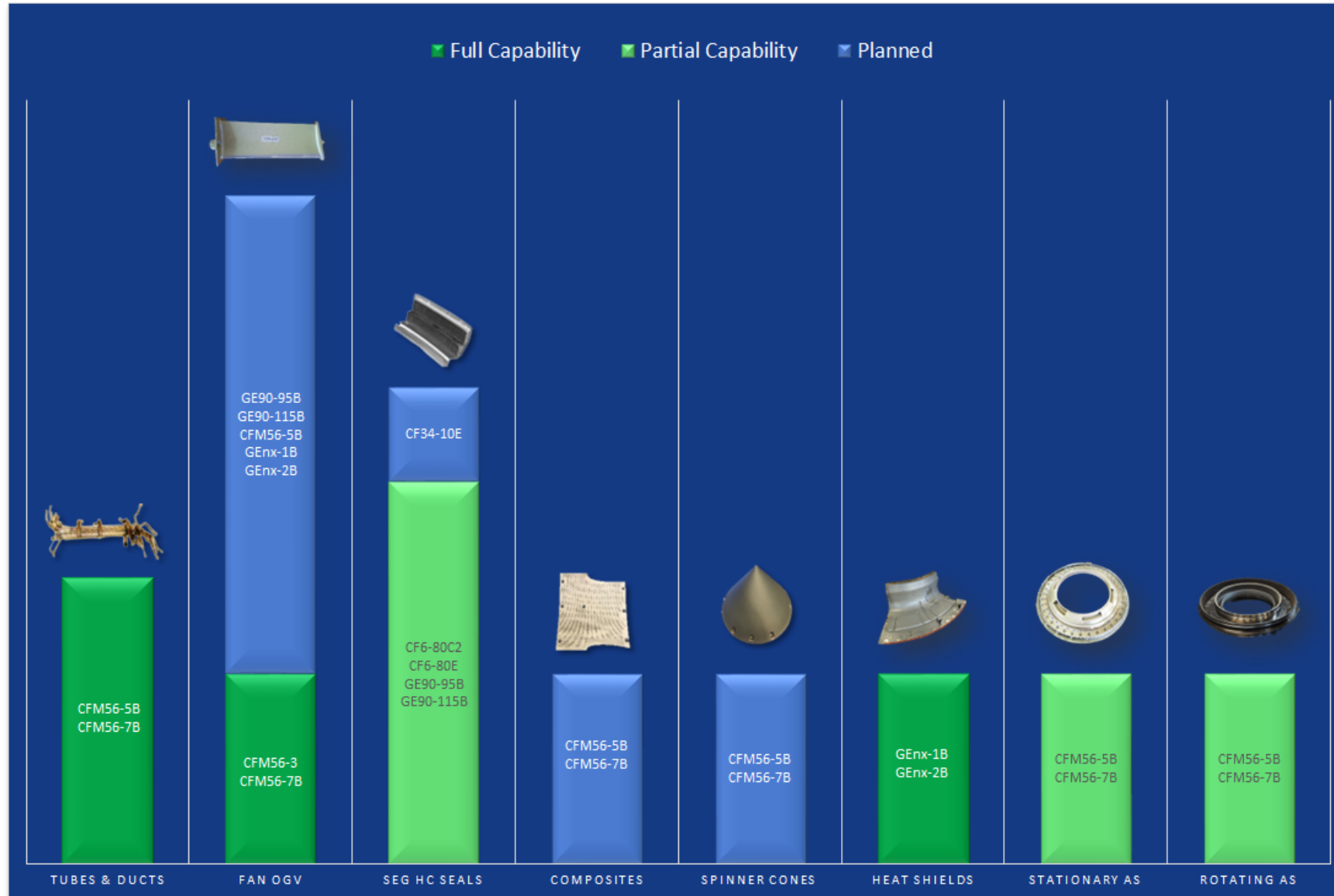


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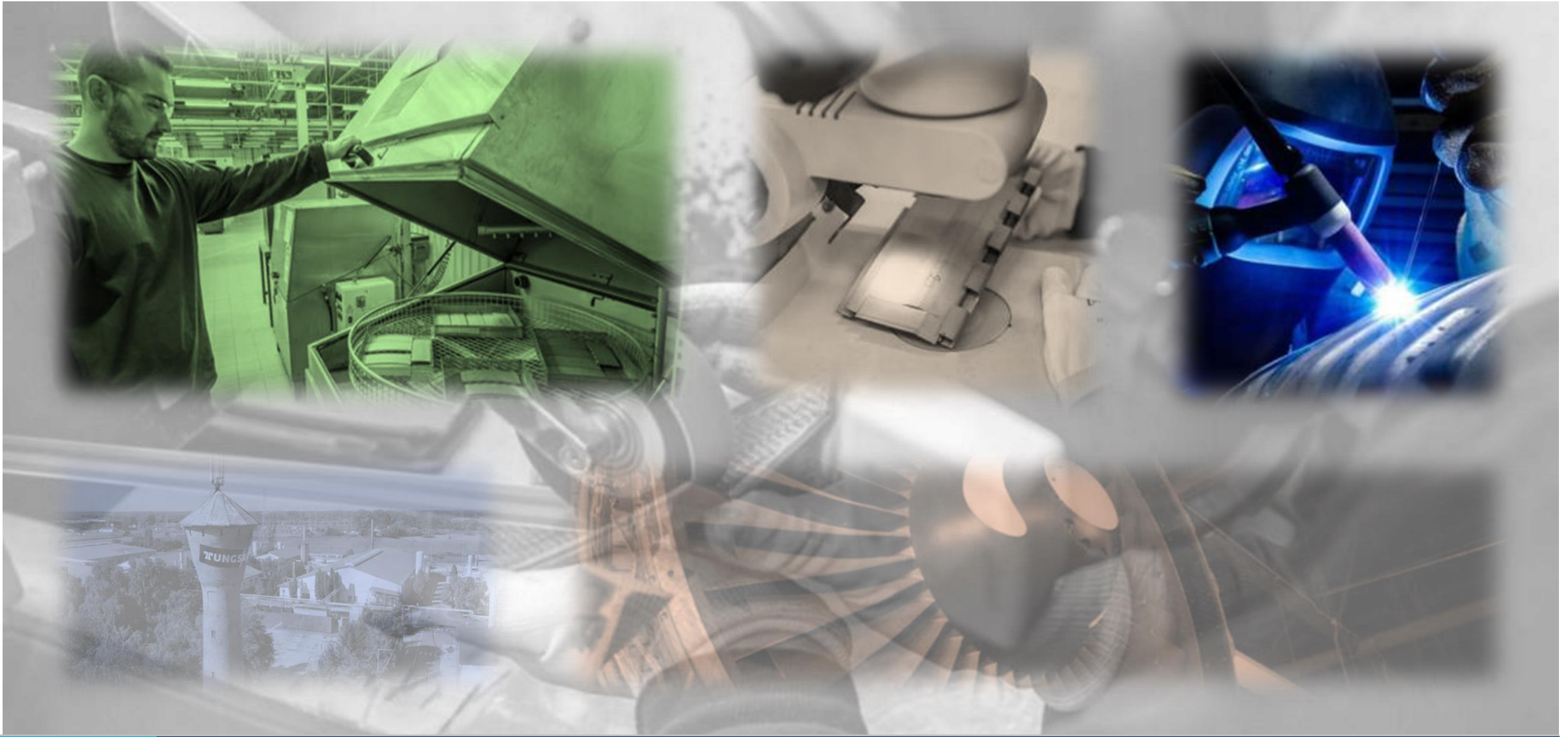
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Aero Space Power Current Capabilities and Plans



Service Technologies



Inspection and Certifying Area

Fenced area for handling incoming goods and a properly equipped area for incoming inspection and certifying parts



Heavy-Light Duty Alkaline Cleaner

- Chemical cleaning of metal and rubber parts
- Ardrox 185L / Ardrox 6367
- Tank size: 1500x1500x1500 mm
- 4 heated tanks + 2 cold rinse tanks
- Operation temperature: RT – 98 °C



Rotating Basket Washer

2 pcs rotating basket for washing metal parts with detergent and rinsing with water

- Washing Capacity (Ø X H) Ø 98 H 54 cm

- Basket Load Capacity 200 kg

- Tank 270 lt



Pressure Tester

Medium: water and air

Water tester:

- Low pressure: 18-800 PSI
- High pressure: 800-6000 PSI
- Size: 700 x 1800 x 790 mm

Air tester:

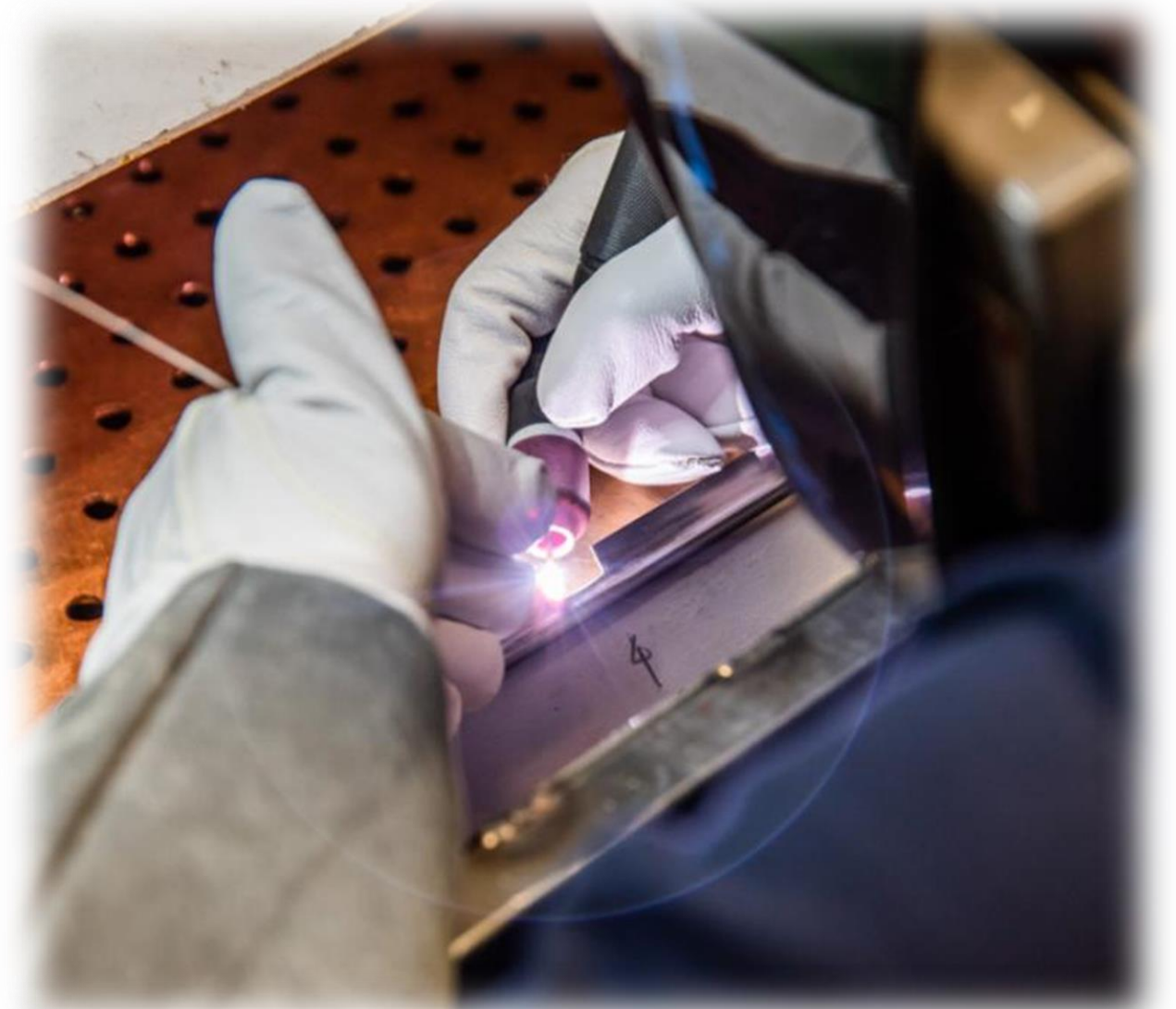
- Pressure: 0-87 PSI
- Size: 600 x 1910 x 490 mm



Welding Capacity

Each welding position fillet weld, butt weld

- Welding qualification: AWS D17.1
- II.A - Austenitic stainless steel
- III.A - Nickel base alloys
- III.B - Precipitated hardened nickel base alloys
- IV. - Aluminum alloys
- VI. - Titanium alloys
- VII. - Cobalt alloys



Grit Blasting

Size: 1280 x 980 x 950 mm

Blasting cabin type: pressure sand blaster

Blasting agent:

P220 aluminium-oxide

Plastic mesh 20-30

Glass bead fraction: 70-110



Chiseling, Grinding Booth

Welding preparation, finishing and removal of residual honeycomb and brazing material from seal segments and ring parts with abrasive grinding wheels

- Pneumatic Air grinders
- Air belt Sanders
- Belt Grinder Booths
- Air chisel tools



Blending Area

Area with extraction equipment dedicated to incoming damage or in-process grinding, equipped with different types of grinding tools



Conturing Area

- Recovering original geometry of shroud parts
- Dimensional inspection with contour gages
- On-site design and manufacturing of the desired tools and fixtures



Drying Oven

Oven used for drying operations with different low heating temperatures, heating for shrink joints

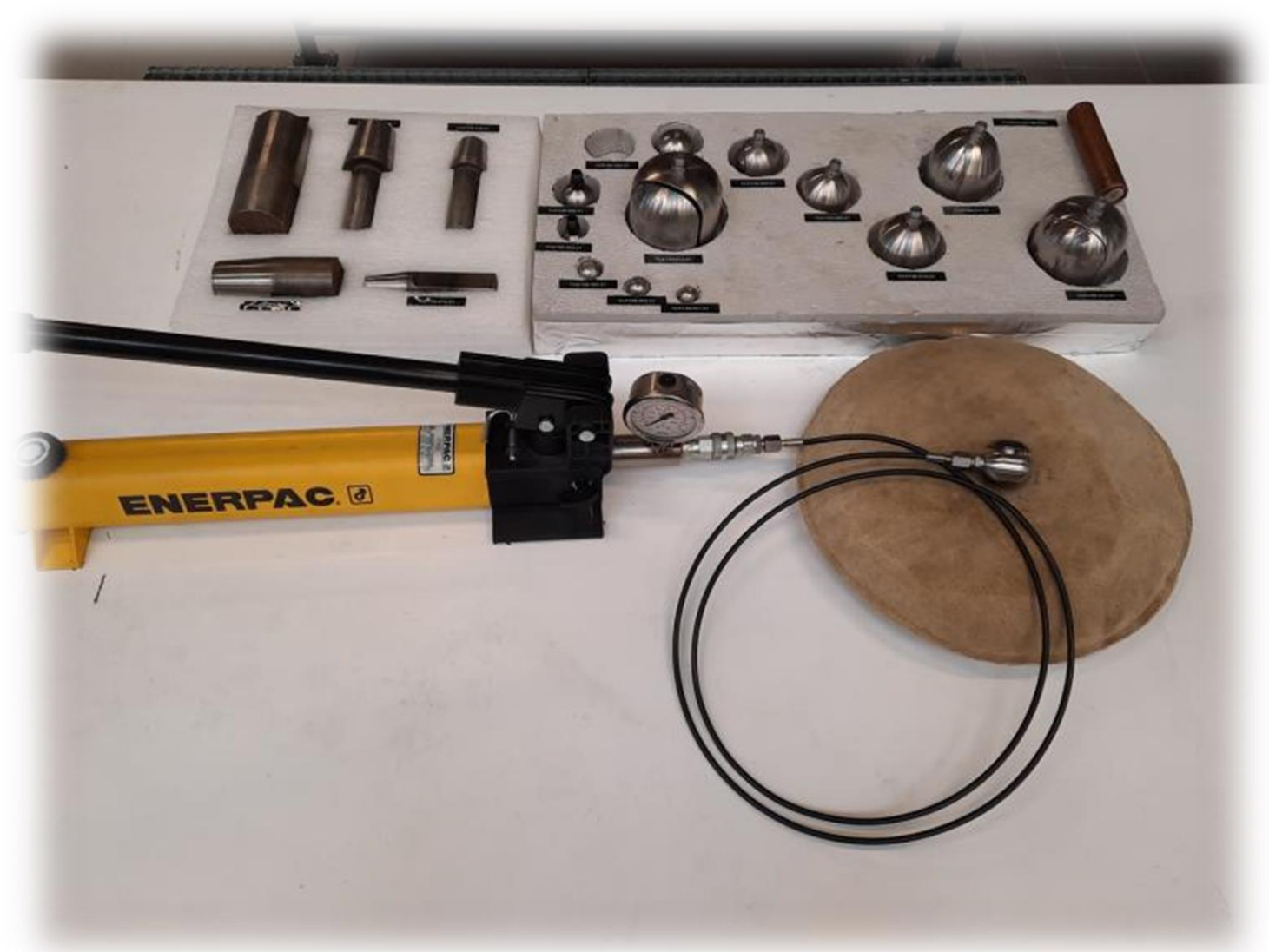
- Capacity (Liters) 400Max
- Temperature (°F) 527Max
- Temperature (°C) 275



Ball Mandrell

Hydraulic expansion repair of damaged and dented pipe sections and pipe ends

Mandrel diameters: 17, 20, 22, 24, 34, 37, 41, 47, 52, 58, 70, 80 mm



Tube Bending

Jutec 4800 mandrel bending device

- Bending capacity \varnothing 6 to 50 mm
- Max. tube length: 2840mm
- multi functional machine control setting of bending angle (0.1°)



Etching Area

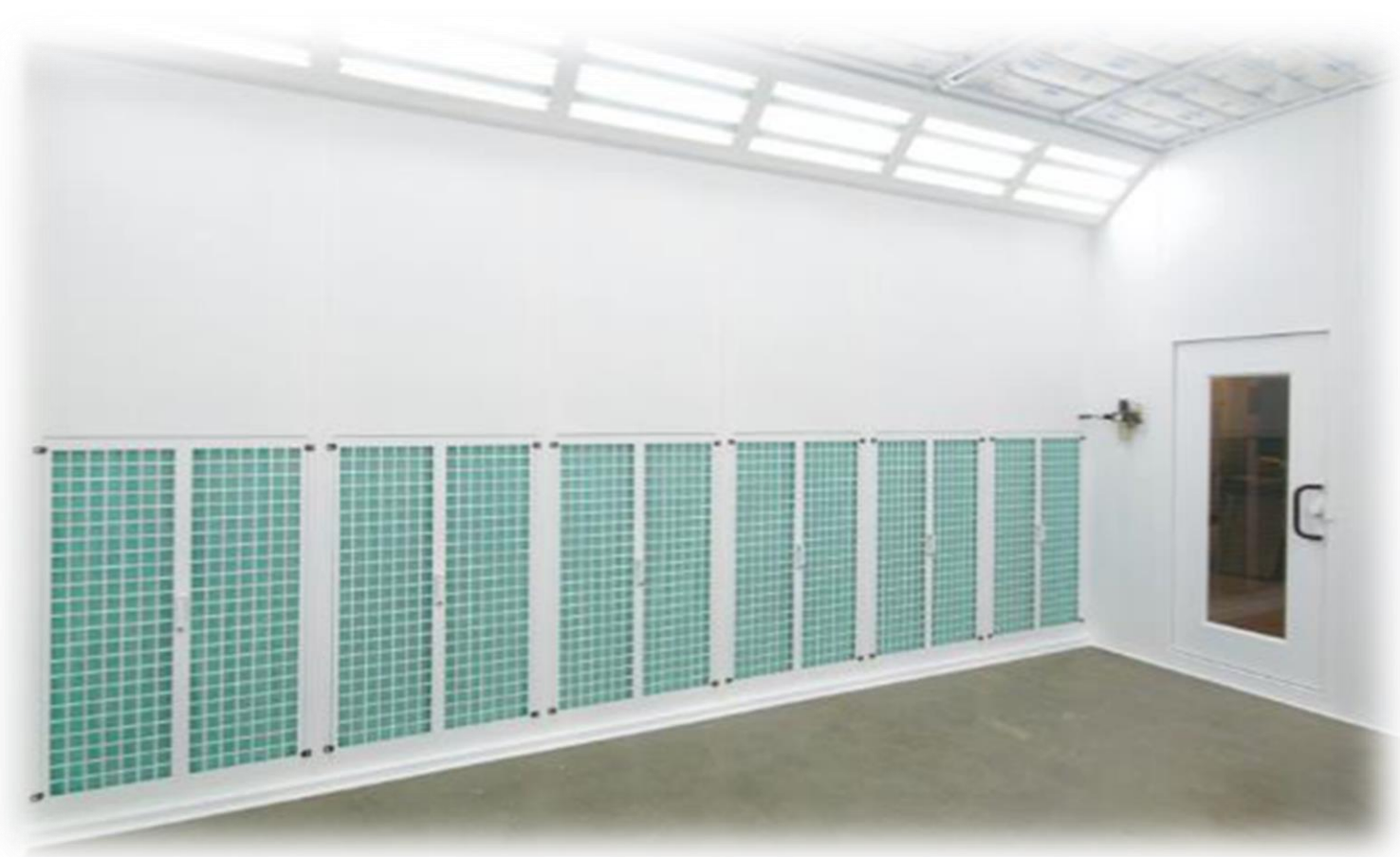
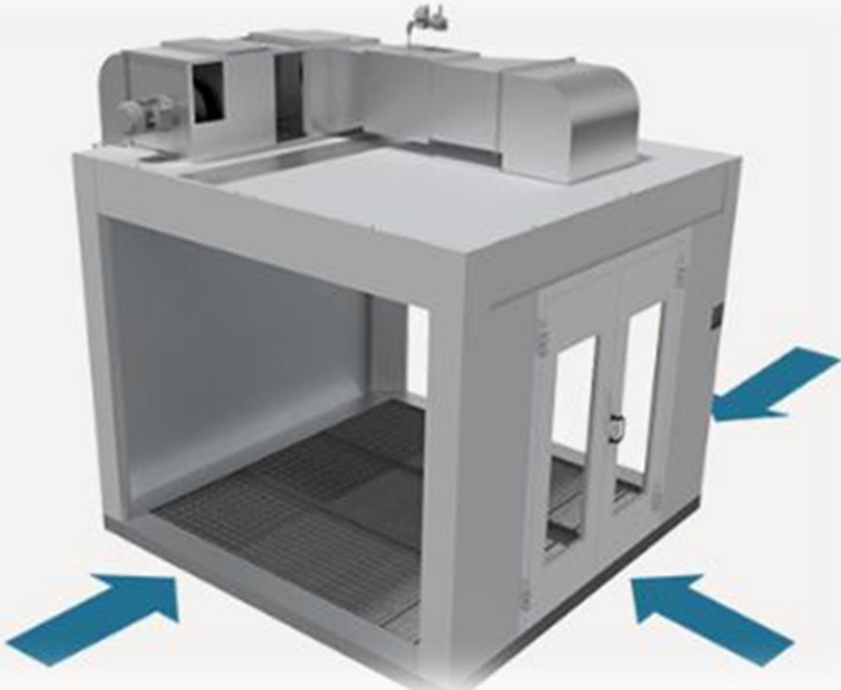
- Swab etching booth for preliminary step before fluorescent-penetrant inspection that is used to permit revealing local indications in the metal surface
- Workbench size 1500 x 900



Painting Booth

Application of a high-strength precision paint coating to various parts exposed to high stress during operation. Equipped with a separated filter surface and side suction to achieve the perfect coating.

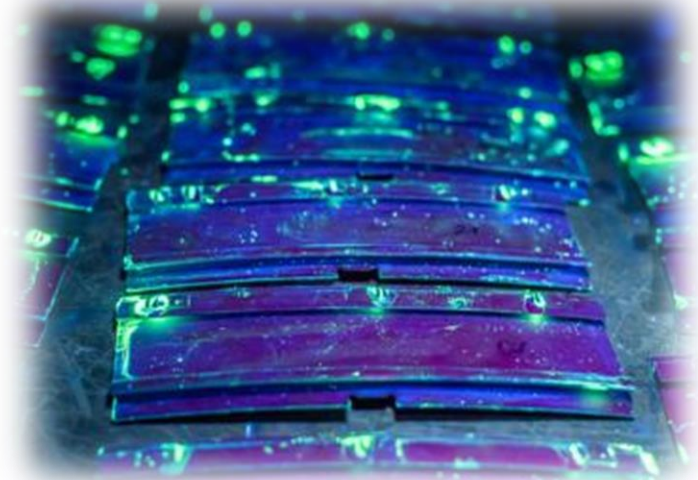
Useful internal dimensions: 3420x3420x2800 mm



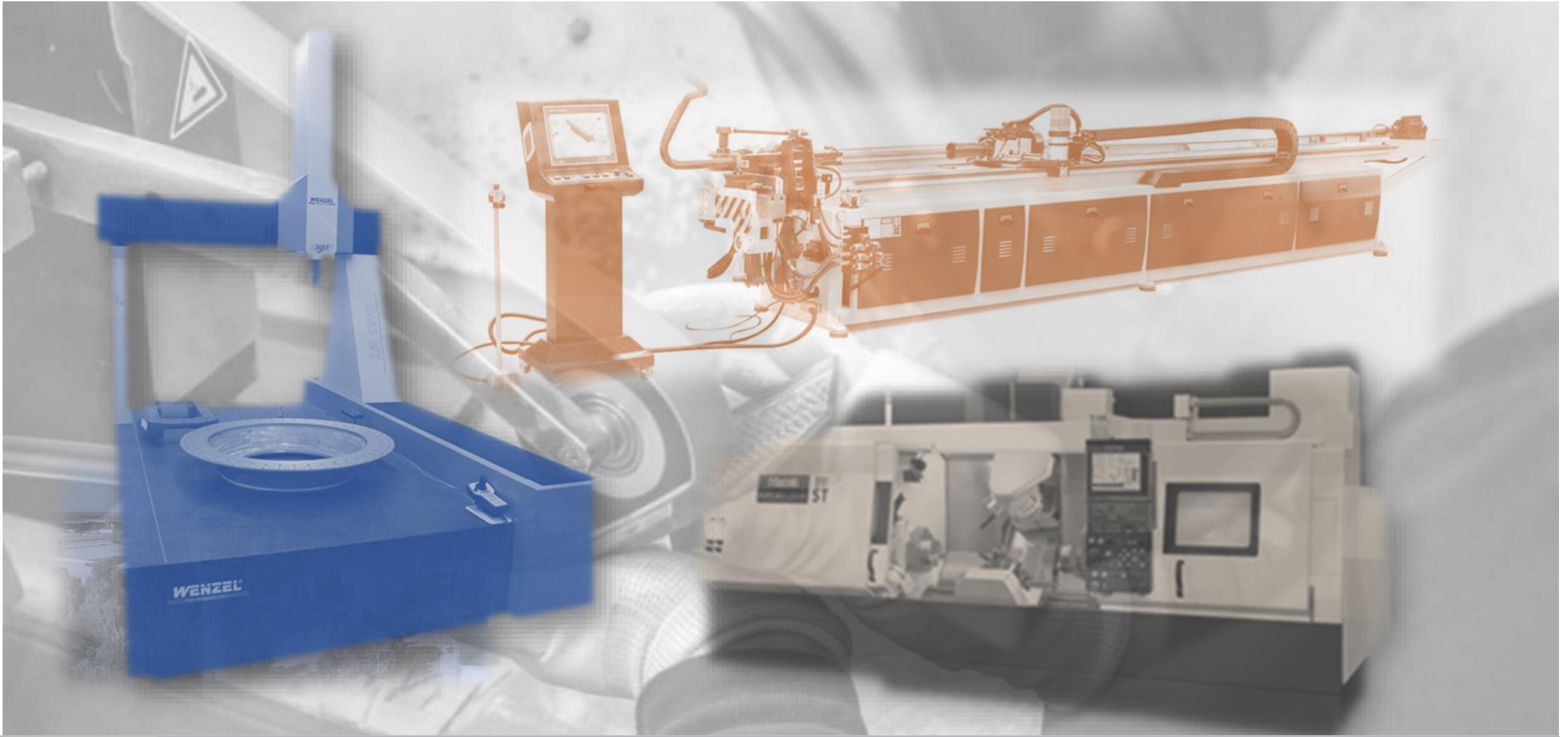
Max product size: 850x850x500mm

Consist of 8 main elements

- 1. immersion tank (Ardrox 970P25E level 3 sensitivity penetrant liquid)
- 2. immersion tank (Ardrox 9814 level 4 sensitivity peneration liquid)
- Darkened examination station
 - 2 washing \ rinsing tanks
 - Emulsification tank (Ardrox 9881 emulsifier)
- Air dryer station
- Developer station (Ardrox 9D4A)
- Spot FPI station (Ardrox 9814 and Ardrox 9D1B)
- Staff qualifications per OEM SPM, AMS2644, ISO9712



Machining Technologies



CNC Turning Integrex 300 ST, QTN 200

Max mfg size (mm)

Accuracy (mm)

X: 200-760

0,005-0,02

Z: 300-1530



CNC Milling VCN 510 C, NCT MM-850

Max mfg size (mm)

Accuracy (mm)

X: 400-1050

0,01 - 0,05

Y: 300-500

Z: 200-600



MAZAK QTC 100 / MAZAK VTC 800 / Citizen L20

Max mfg size (mm)

X: 2000

X: 25

X: 340

Y: 800

Y: 300

Y: 500

Z: 720



ABM 76 CNC I

Max mfg size (mm)

Dia.: 76

Len.: 6000



High Pressure Water Jet Cutting

PTV WJ3020B-1Z-D (X-Y CNC TABLE)

X, Y Travel	3050 x 2050 mm
Accuracy of positioning	+/- 0,05 mm
Precision [mm]	+/- 0,05 mm
Max. of depth (calibrated)	100 mm
Best surface roughness	Ra 3,2
Width over set (jet stream)	1,2 mm
Max. bleed (booster made in USA)	4100 bar
Maximum working speed	12 mm/min

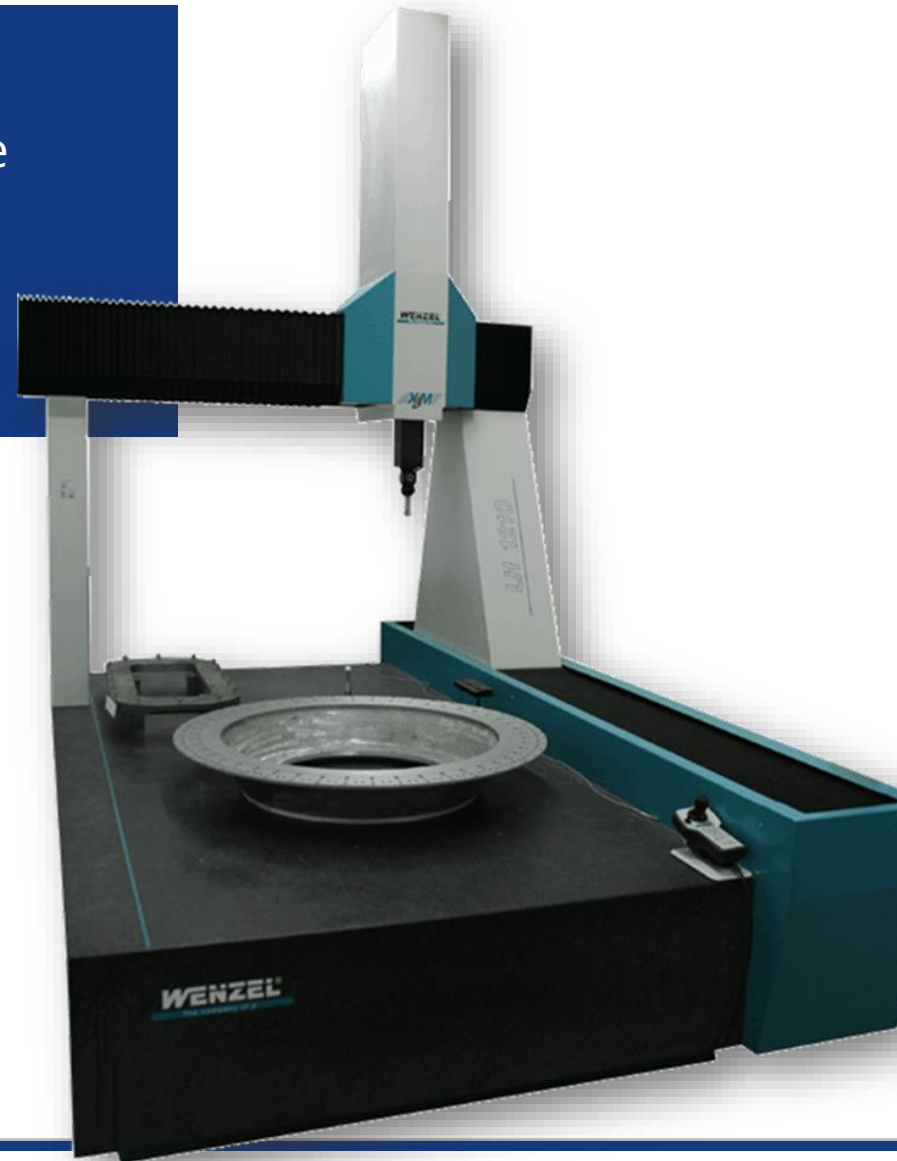


CNC 3D-Measuring Equipment

WENZEL LH 1210

CNC Portal Design Coordinate Measuring Machine

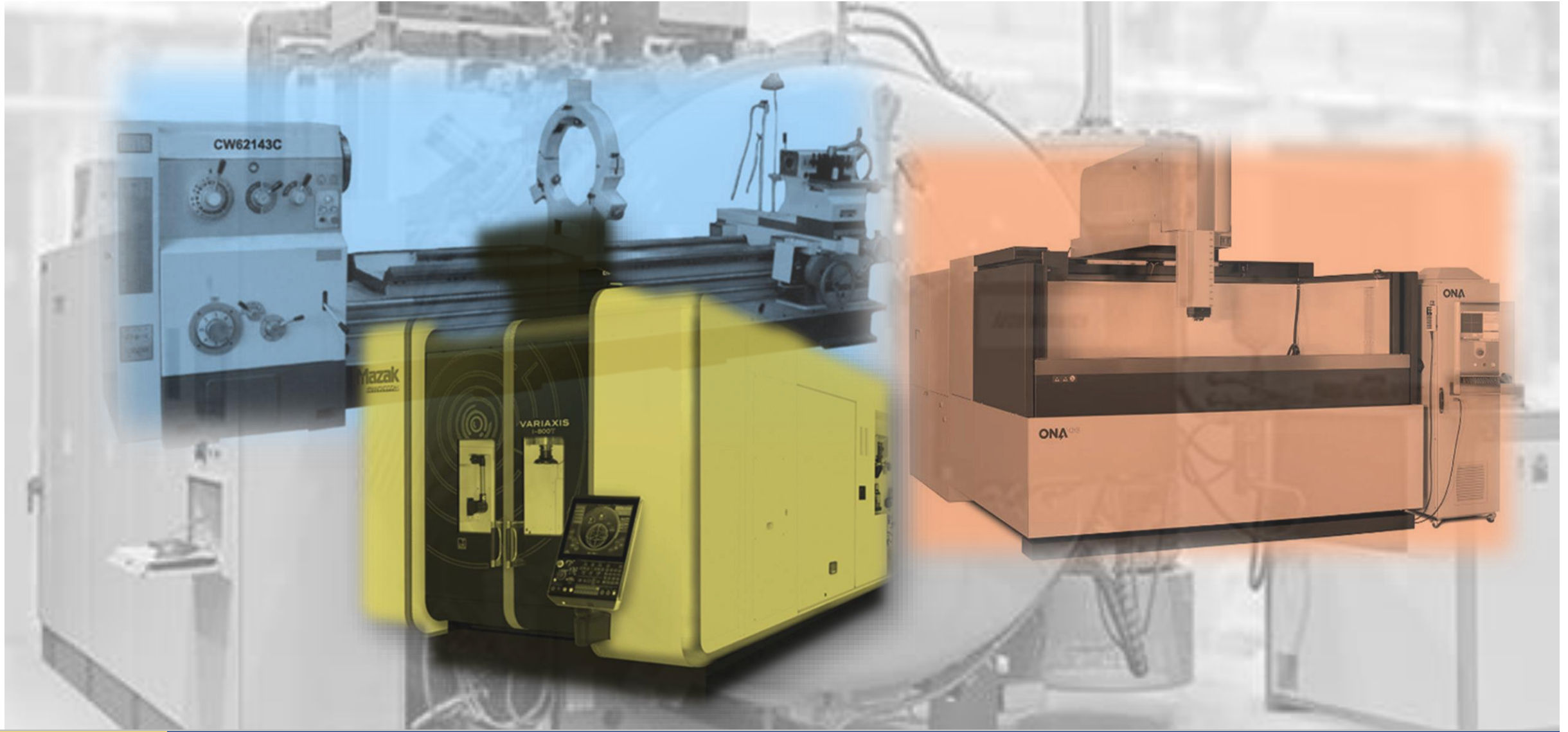
- 1200 mm x 2000 mm x 1000 mm
- 0,0026 mm + (L/300mm) mm



Hajdúböszörmény Plant

Aero Space Power 2023

New Investments



SECO WARWICK Horizontal Vacuum Furnace

Furnace meets requirements of the norm AMS 2750F, class 2, type B.

- Working zone: 1300x1500x1000 mm
- Max load gross weight: 2000 kg
- Max temperature: 1300 °C
- Temperature uniformity: ± 5 °C
- Operating vacuum: 1×10^{-4} Torr
- Quenching gas: Nitrogen, Argon
- Max quenching pressure: 1,5 bar abs.



2023 Q3 Realization

MAZAK Variaxis I-800 Vertical Machining Center

- Handles parts up to 1000 mm diameter and 375mm high / 800 mm diameter and 500 mm high
- XYZ axis travel: 730 x 850 x 650 mm
- Max. load parts weight: 1000 kg
- 5-axis capabilities



2023 Q4 Realization

ONA IRIS6+ EDM

- XYZ axis travel: 1000x750x500 mm
- XYZ Positioning resolution: 0,0001 mm
- Max. product weight: 4000 kg



2023 Q4 Realization

CW62143C, Lathe

- Max. swing over bed: dia. 1400 mm
- Max. swing over cross side: dia. 1060 mm
- Distance between centers: 2000 mm
- Tolerance grade: IT6



2023 Q4 Realization

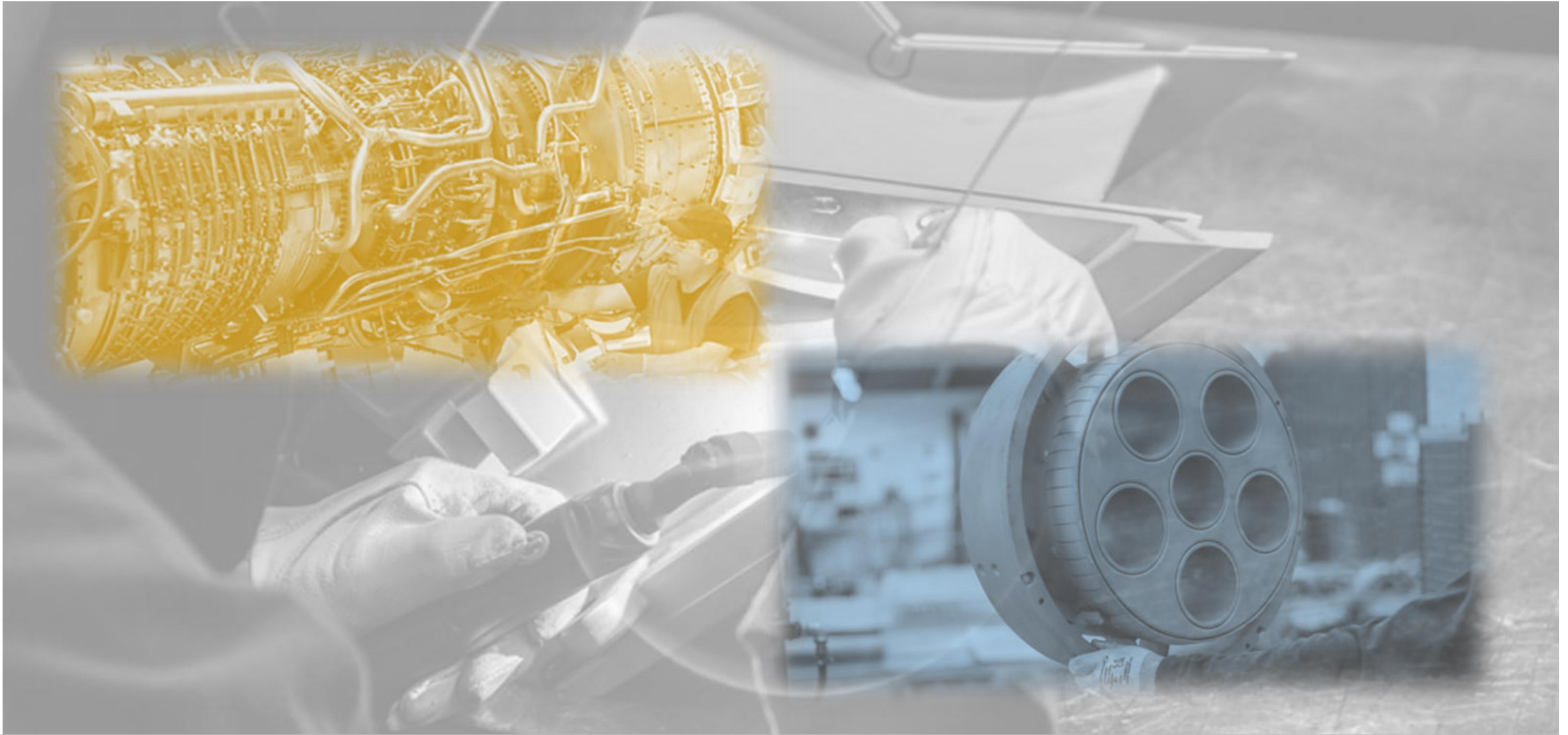
OERLIKON METCO Multicoat System

- Atmospheric Plasma Spray Process
- Combustion Powder Flame Process
- HVOF-GF Process
- Max work-piece diameter: 1500mm
- Max loading capacity: 1000kg
- Gravimetric powder feeding



2024 Realization

Gas Turbine Technologies



Transition Piece Maintenance

Thorough grinding or grit blast cleaning is essential before the maintenance process for both visual and red dye penetrant inspection to clearly map the damaged areas. Beyond the cleaning and inspection processes, Tungsram performs TIG weld repair on certain areas. Due to the high heat effect of welding, the geometric control of the pieces and the performance of other measurements require great expertise and practice.



Power Nozzle Maintenance

- Based on the volume of the damage, medium or heavy work scope is determined during the inspection process.
- Usually, heavily cracked and oxidized zones require weld repair. The number of welded areas will determine the scope of work as medium or heavy.
- The majority of cracks, detected by red dye penetrant inspection, can be repaired by TIG welding. Due to the special geometry of the parts, welding and machining require exceptional attention and expertise.



CAP & LINER Maintenance

- As a non-standard test method, Eddy current is used to identify discontinuities in certain interfaces.
- The documentation of repair characteristics shall be managed in a well-structured manner with high-resolution photos attached.
- During the maintenance workshop visit, the parts must be thoroughly cleaned, and TBC coating removed by grit blasting before inspection so that the scope of repair work can be clearly identified. Disassembly, red paint penetration, sizing, and visual inspection are also performed as part of the service / repair inspection.



Thank You For
Your Attention!



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