



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under GA No 101004730.

Zanon Research & Innovation

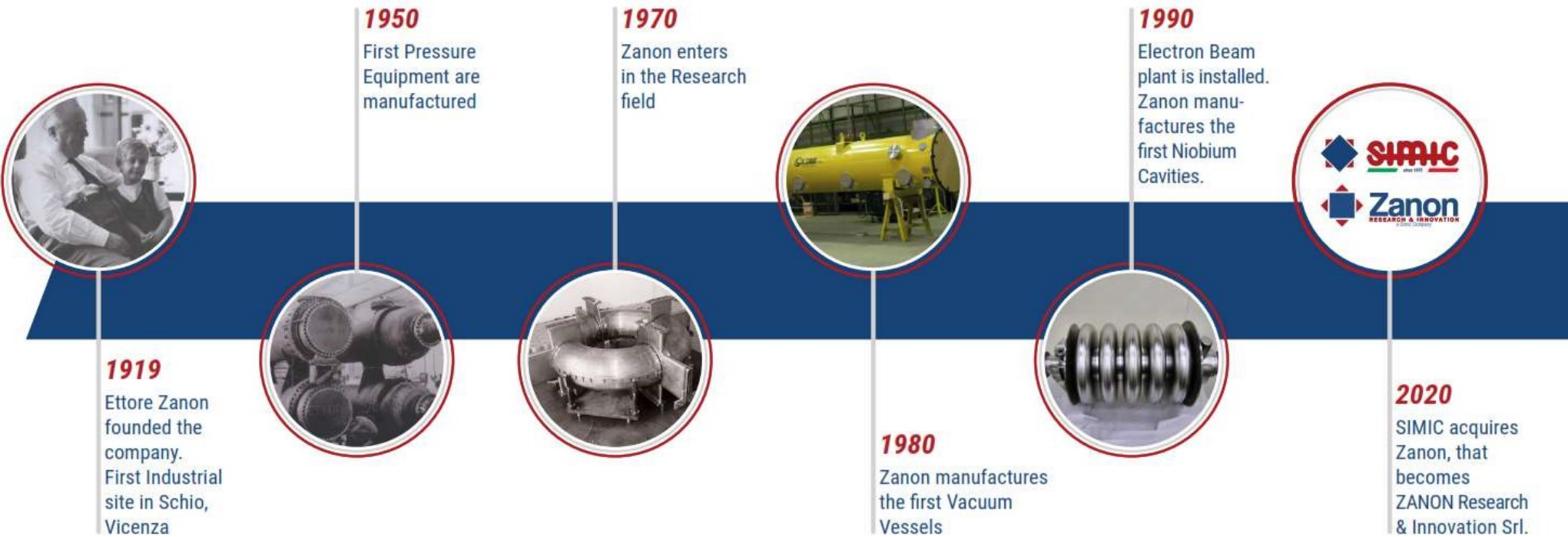
High technology products for research & industry

DESY 14-15 September 2022

Paolo Barbero – Zanon Operations Director



ZANON history



SIMIC GROUP overview



Since 1975, Simic is an Italian diversified company with a solid experience in **engineering**, **high-quality manufacturing** of critical process equipment, **assembly** and **maintenance** of industrial plants.



Simic can reliably provide clients with a whole range of high-pressure products: from heavy wall **Pressure Vessels, Reactors, Heat Exchangers, Vacuum Vessels, Cryogenic equipment** to **mechanical components with very strict tolerances**.



Main sectors:

Oil & Gas – Chemical & Petrochemical – Fertilizers – Nuclear Energy & Decommissioning
Fusion Energy – Power Generation – Aerospace – Scientific Research – Renewable Energy



Business size of the Group (average):

160 M€ year turnover

23 M€ EBIT

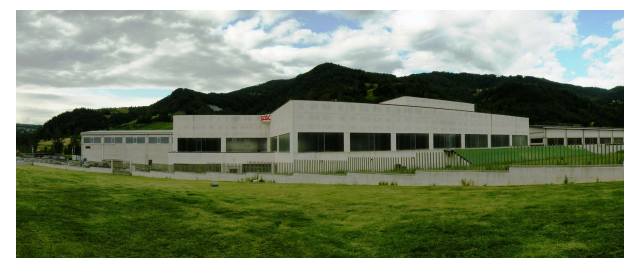
820 manpower units



Industrial sites:

- **Camerana** (Cuneo) IT – Simic Workshop & Headquarter
- **Marghera** (Venice) IT – SIMIC High capacity workshop with direct dock access
- **Schio** (Vicenza) IT - Zanon workshops

Present in Germany, France, Belgium, Romania, Turkey, USA, Mexico & Brazil with Offices and Facilities.



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SIMIC GROUP workshops



Workshops: 2.500 m²
Office: 1.000 m²
Outdoor Area: 5000 m²

SCHIO – Vicenza
Zanon workshop

Workshops: 18.000 m²
Office: 1.500 m²
Outdoor Area: 45.500 m²

CAMERANA – Cuneo
SIMIC workshop & Headquarters



MARGHERA – Venice
SIMIC high capacity workshop, direct dock access
Capacity up to 3.000 tons
Building height: 30 meters
Lifting capacity: 400 tons by building crane
Workshops: 6.000 m²
Office: 500 m²
Outdoor Area: 25.000 m²

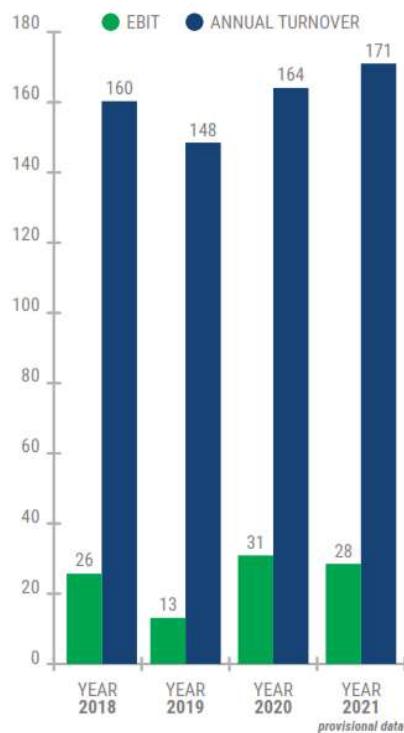


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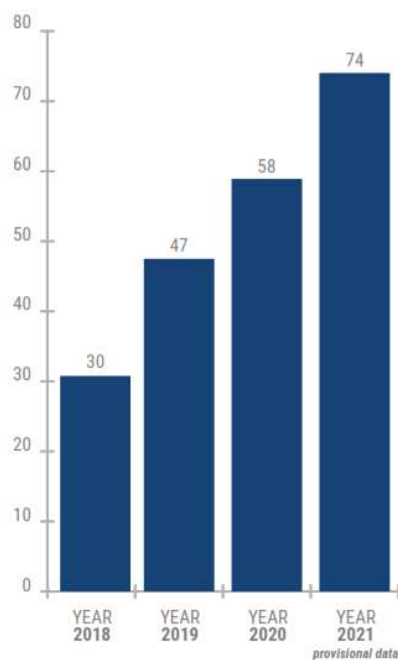


SIMIC GROUP Financial and Operating highlights

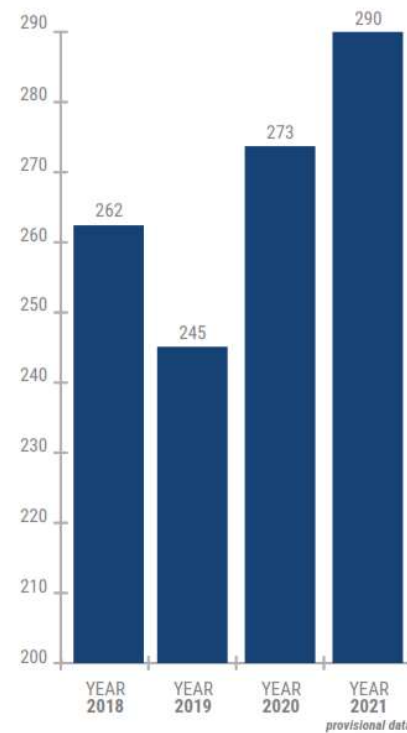
TURNOVER & EBIT
(€ - Millions)



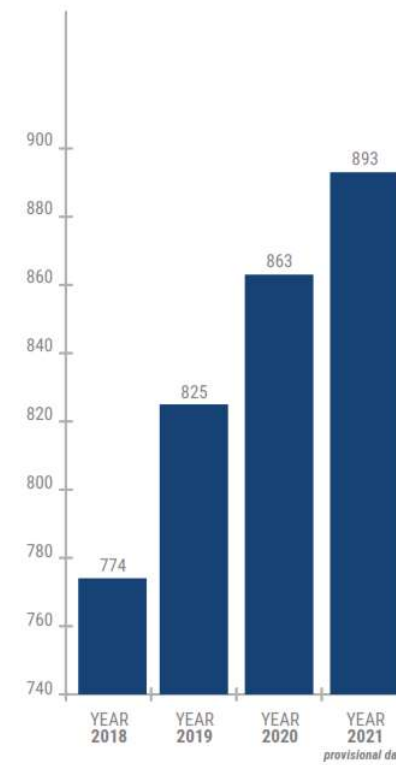
NET FINANCIAL STANDING
(€ - Millions)



TOTAL ASSETS
(€ - Millions)



MANPOWER
(Units at year-end)



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SIMIC GROUP BUSINESS UNITS



CRITICAL PROCESS EQUIPMENT

Design & Manufacturing of Process Equipment for:

- Oil & Gas
- Chemical & Petrochemical
- Fertilizer
- Power Generation
- Nuclear Energy



HIGH TECHNOLOGY COMPONENTS

Design & Manufacturing for:

- Fusion Energy
- Scientific Research
- Aerospace

Products:

- Cryostats
- High Vacuum Equipment
- Mechanical components



HIGH TECHNOLOGY PRODUCTS

For scientific research & industry:

- RF Cavities
- Cryostats & Cryomodules
- Ultra High Vacuum Chambers
- Special mechanical parts



SITE ERECTIONS & MAINTENANCE

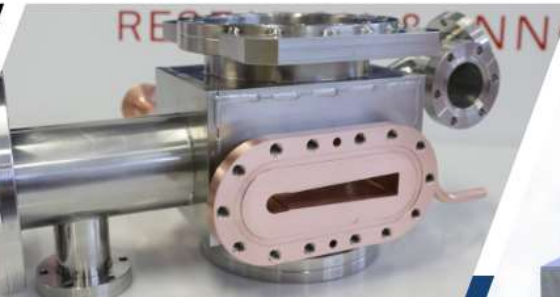
Turn key projects for the following industrial sectors:

- Pharmaceutical
- Food
- Power Generation
- Tobacco
- Naval
- Renewable Energy
- Chemical & Petrochemical



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ZANON - Working for +30 years with the most important Physics Research Institutes in the world, from prototyping to series production.



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ZANON ASSETS



Nr.2 EBW Electron Beam Welding Stations
+30 years experience in EBW welding

3D METROLOGY

Equipped with the state of the art 3D measuring devices
Large know-how on reverse engineering

RADIOFREQUENCY TEST & TUNING

Dedicated RF tests equipment including DESY machine
for cavities final tuning



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ZANON ASSETS



SPECIAL MILLING & TURNING MACHINES

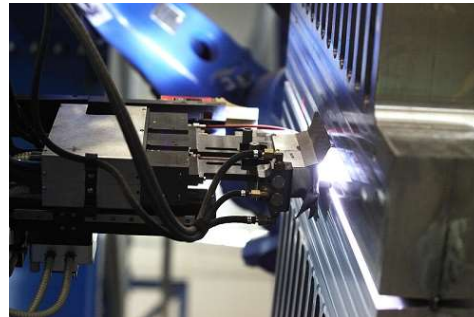
3 and 5 axis milling and turning machines
EDM and super finishing machines
Dedicated machines for Niobium machining

FORMING MACHINES

Deep drawing, spinning, bending, rolling

ROBOTIZED TIG WELDING MACHINES

Hot Wire Narrow Gap robotized Tig welding
Orbital welding machines



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ZANON ASSETS



ISO 7 and ISO 4 Clean Rooms 450 m²

For clean assembly, final surface treatments, assembly
For RF cold test. High Pressure Rinsing with Ultra Pure
Water.

ISO7 area 220 m²

ISO4 area 200 m²

THERMAL TREATMENTS

Vacuum Oven up to 1200°C, cryopumps, RGA
Molibdenum Hot Chamber
RF cavities Nitrogen doping

CHEMICAL SURFACE TREATMENTS

Electropolishing plant
New Horizontal Rotating BCP machine



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SRF CAVITIES REFERENCES



SUPERCONDUCTING RF CAVITIES

- SC Quadrupole for ALPI Linac
- SC Quarter Wave cavities for ALPI Linac, ISAC-II, SPIRAL-II, FRIB
- SC Half Wave cavities for COSY-SCL, TRASCO, IFMIF, DONES
- 1 or 2 Spoke SC cavities for LANL, FNAL, ESS, MYRRHA
- SC Crab Cavities for HI LUMI
- SC Elliptical cavities from 600 MHz to 3.9 GHz for TRASCO, EUCARD, XFEL, ESS, LCLS-II, PIP-II

SCOPE OF WORK:

- Manufacture of Nb cavities and Ti tanks
- Cavities integration into He tanks
- Special treatments and surface cleaning
- RF checks and tuning
- NDE and final checks
- Components certification as per PED or ASME



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CRYOSTATS, CRYOMODULE & VACUUM CHAMBER REFERENCES

CRYOSTATS & CRYOMODULES

Zanon working with Research Institutes from early '80.
R&D phase and production of Cryomodules for TESLA, XFEL and PIP-II.



ULTRA HIGH VACUUM CHAMBERS:

Manufacturing of all types of High Vacuum Chambers followed by others various type of complex construction.



VACUUM VESSEL FOR SPIDER PROJECT, NBTF, RFX Padova IT:

Manufacturing of the Ion Source prototype for ITER beam injectors:

- Vacuum Vessel
- Beam Source support frame
- Beam Source electrostatic shields
- Beam Source handling tool



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SPECIAL MECHANICAL PARTS REFERENCES

RF CAVITIES TUNERS

Production of prototypes and series of tuner mounted into SRF cavities.

ANTENNAS FOR JET:

Manufacturing of components for JET fusion machine and for ITER. Inconel 600 and 718 material. Ni electroplated and Al-Ag plated components. Copper galvanic deposition.

DIVERTOR PARTS FOR JET:

316L modules for Divertor MK1 (series production).



ZANON INVOLVEMENT in EXFEL Project



A) Manufacture and final treatment of 420 units of the 9 cells , 1,3GHz SC cavities

ZANON scope of work:

- Manufacture of the 1,3GHz cavities and their Titanium Helium tanks
- Integration of the cavities into their tank /Treatments and Surface cleaning treatments
- Components manufacture and certification according to PED (Pressure Equipment Directive)
- Delivery production rate 4 units/week

B) Manufacture and testing of 146 units of Titanium Helium tanks

ZANON scope of work:

- Tank prefabrication and He leak check
- Delivery to DESY

C) Manufacture and testing of 45 units of XFEL Cryomodules

ZANON scope of work:

- Vacuum vessel and cold-mass prefabrication and testing
- Delivery to the assembly site (CEA-France)



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ZANON USE OF DESY VT FACILITY

ZANON RESEARCH & INNOVATION				
Pending Projects				
Project name	Frequency	Amount of cavities	Operating temperature	Comment
EXFEL	4 a week	Nr.420 1.3GHz	2K	naked and with tank
LCLS-II	On demand	Nr.4 1.3GHz	2K	naked
China	On demand	Nr.4 1.3GHz	2K	naked
Foreseen Projects				
Project name	Frequency	Amount of cavities	Operating temperature	Comment
China	tbd	>100 1.3GHz	2K	naked and with tank

CONCLUSIONS



We do not need to remind that **DESY** is one of the **key players** for the SRF community.

For ZANON, **DESY** is not only an important **Customer** but, it is a **strategic technical partner** in our continuous improving process to increase SRF performance by:

- developing and manufacturing new SC design
- developing new technologies and special treatments
- sharing the experiences gained for further Projects
- providing specific services (eddy current testing of Nb sheets, etc...)
- performing VT of all our SRF Projects
- providing DESY high level supports in the interpretation of VT results

The **opportunity to make use of DESY VT facility** it is really important for our Company, in particular looking at the SRF upcoming SRF Projects in which we are involved.

It is **mandatory to have a reliable testing facility**, close to our workshop and managed by skilled technicians with long experience on SRF cavities.



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www.zanonresearch.com

www.simic.it

Thanks for your attention!

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