



A journey through past and current contributions to the Nuclear market by TOSTO Group Companies, a Manufacturing network ready to meet the new Nuclear demand.

La Ricerca e l'industria per la Young Generation, San Pietro in Vincoli, 12 April 2019



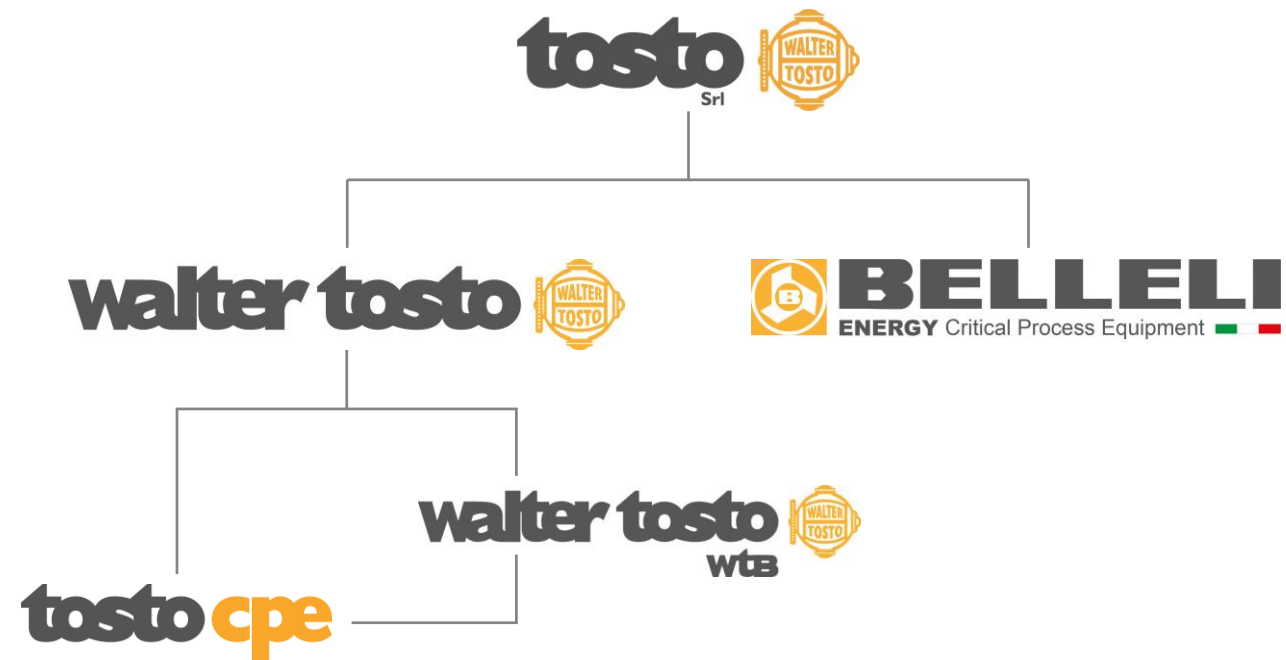
What's in a name?

TOSTO – Italian adjective meaning *tough, determined*

In line with the very meaning of the name, through hard work and dedication, the Tosto Group has become a worldwide leader in the design and construction of critical items.

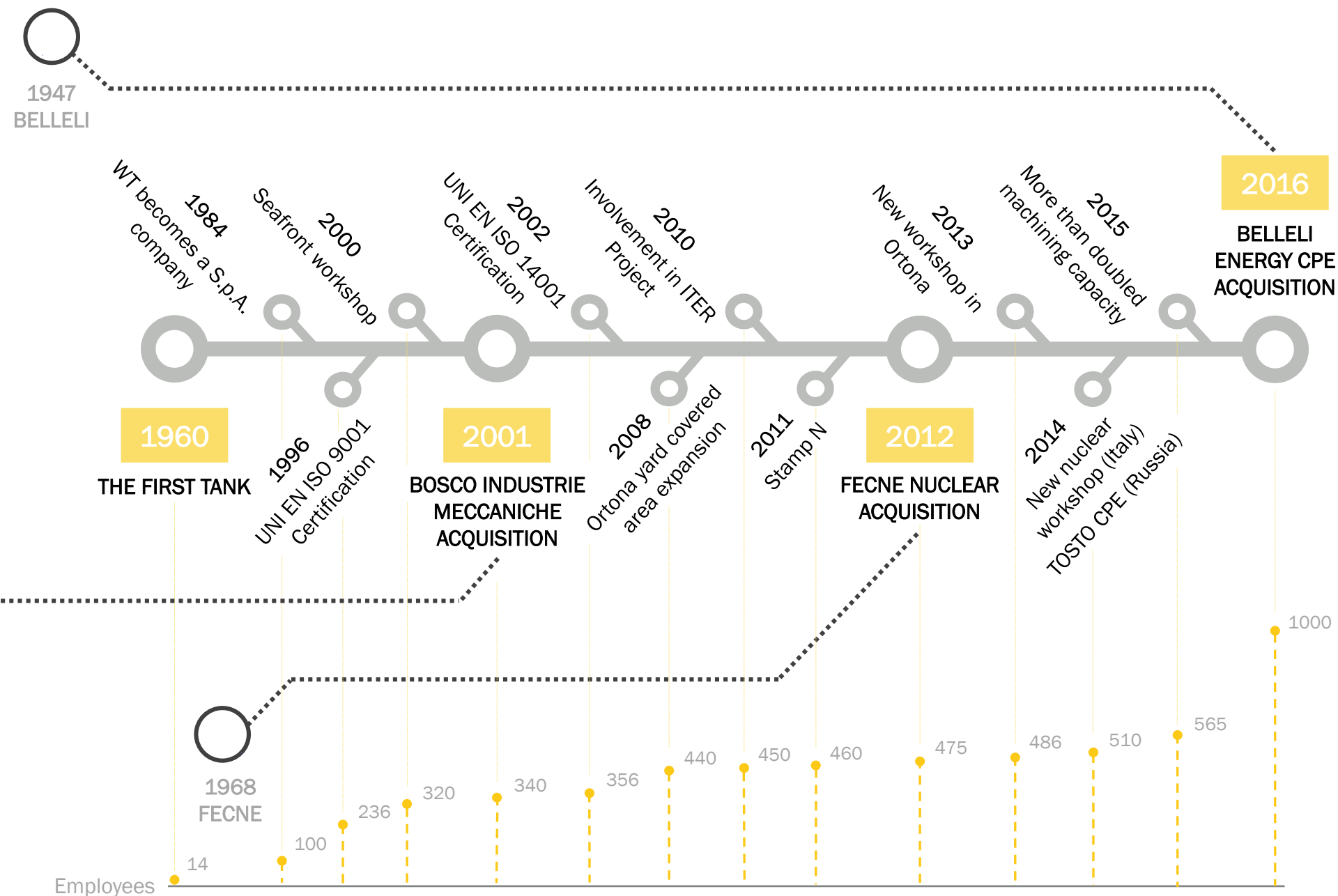


Walter and Luca Tosto

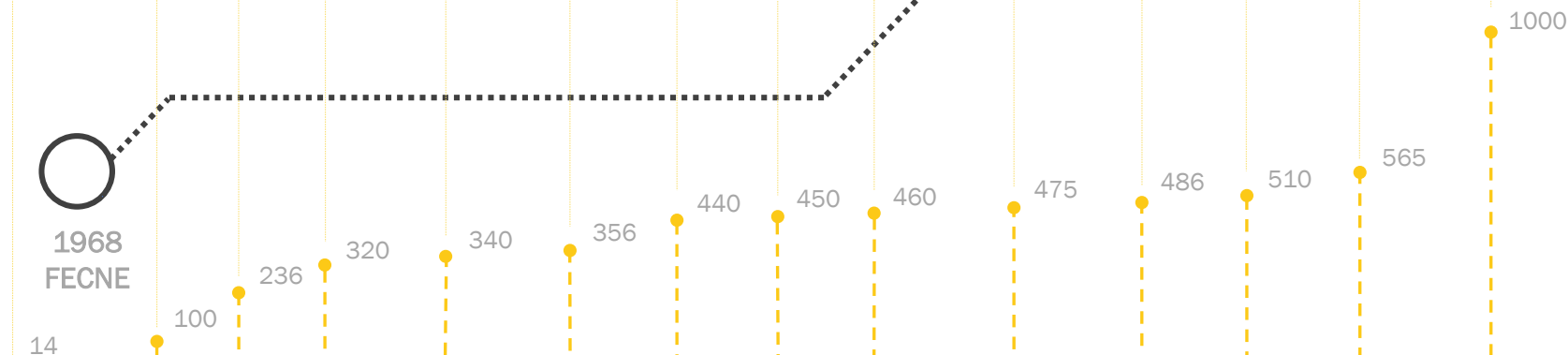


Today, driven by a commitment to produce safe, reliable, high-quality equipment on a global scale, the Tosto Group manufacturing network is ready to meet the new Nuclear demand of the 21st century.

The Tosto Group at a Glance



Employees



210.000.000 €
Turnover in 2017



110.000.000 €
Assets



100.000.000 €
Equity and Reserves



60.000.000 €
Investments in 3 years



380.000.000 €
Order Portfolio



1000 +
Employees in 2017



1.000.000 +
Manufacturing
Manhours/year



650.000 sqm
Workshop Area



3 Sea/River Front
Workshops



BELLELI
ENERGY Critical Process Equipment 



60.000 sqm covered, 280.000 sqm uncovered

walter tosto
wtb 



25.500 sqm covered, 14.500 sqm uncovered

walter tosto
wtb 



River-front workshop under construction

walter tosto 



91.000 sqm covered, 340.000 sqm uncovered

walter tosto 



9.000 sqm covered, 20.000 sqm uncovered

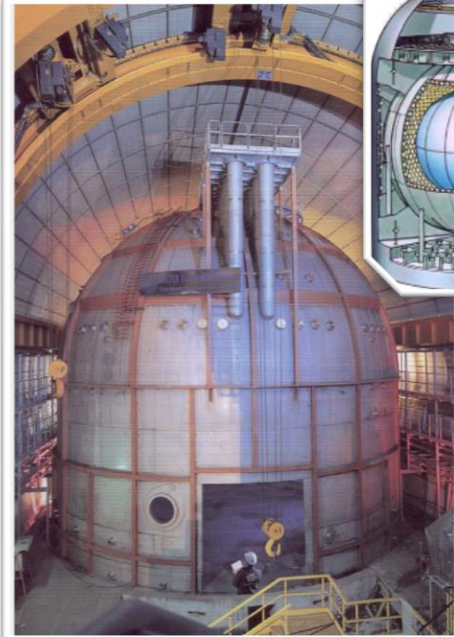




In its workshops located in Central Italy, Walter Tosto has actively taken part in a number of Big Science projects. Such projects are characterized by high funding, long durations, coordinated groups of scientists and technicians as well as large laboratories equipped with tools and machines specifically manufactured for the project.



100.000 sqm covered, 360.000 sqm uncovered



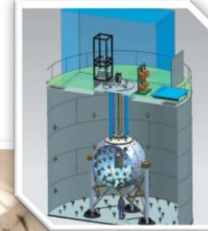
Produced in the Big Bang, and now in stars and nuclear reactors, neutrinos are everywhere, but are not easily detected.

The Ø18m Borexino detector lies in a limited access facility over 1km underground, making the installation of the large steel structure a challenge. The supply also included a Ø13.7m Stainless Steel Sphere.

Borexino Project – Detection of low-energy neutrinos



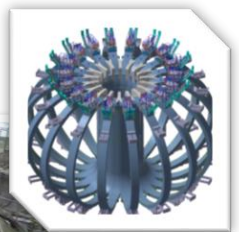
Deployed within a Ø4m Stainless Steel Sphere, the DS-50 TPC acts as Liquid Scintillator Veto in direct-detection dark matter experiments.



Dark Side Project



Supply of 18+2 Toroidal Field Coil Casings for JT-60SA, a fusion experimental project designed to investigate how best to optimise the operation of future power plants.



JT-60SA Toroidal Field Coil Casings



Manufactured equipment for Nuclear power plants in Italy, Canada and France from the 1960's, including Heat Exchangers, Top Closure for Primary Containment Vessel and Steam Suppression Tanks



Heat Exchangers for LaPrade Heavy Water Plant



Over 40 Items delivered for CERNAVODA 1 & 2, including Reactor Vessel, Feedwater Heaters, Steam Generators Subcomponents, Pressurizer and Fuel Channel Bars



Cernavoda 3 Airlock Channel & Calandria



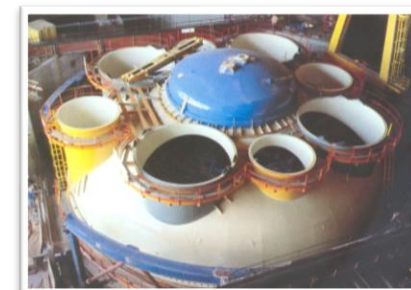
Nuclear components manufactured since the early '70s for Italian/European/USA plants include Heat Exchangers, Pressure Vessels, Pump Casing, Main Containment and Air Locks and R&D with prototypes



Caorso (Italy) BWR Plant Reheaters



Cirene (Italy) HWR Main Steel Containment (38mm thk., ID over 33m)



Superphénix (France) Metal Containment System



Montalto Di Castro (Italy) Heat Recovery Steam Generators

Supply of 18+2 Toroidal Field Coil Casings for JT-60SA, a fusion experimental project designed to investigate how best to optimise the operation of future power plants.

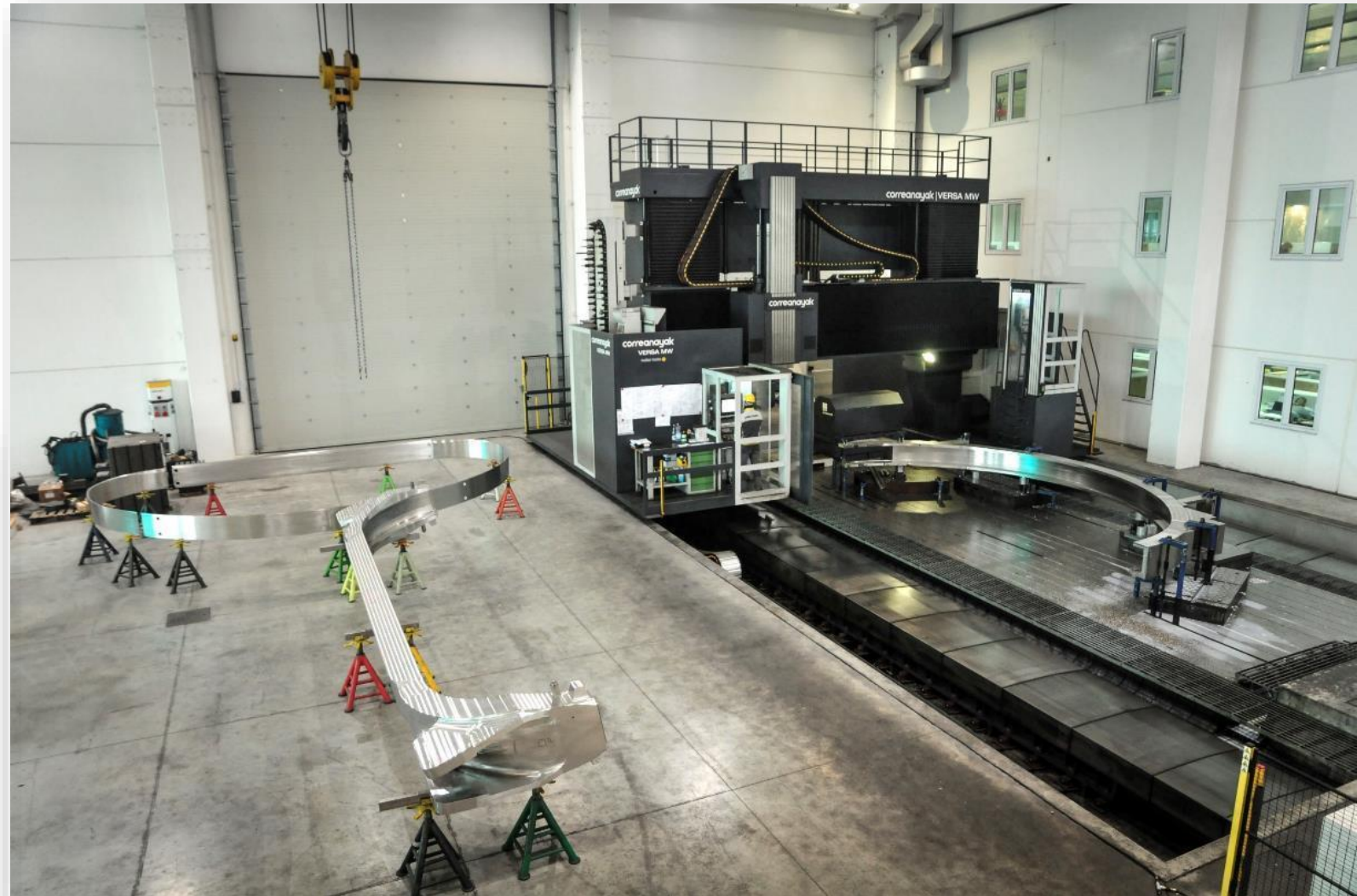
Each D-shaped casing measures:

Height: 7.5 m

Depth: 4.5 m

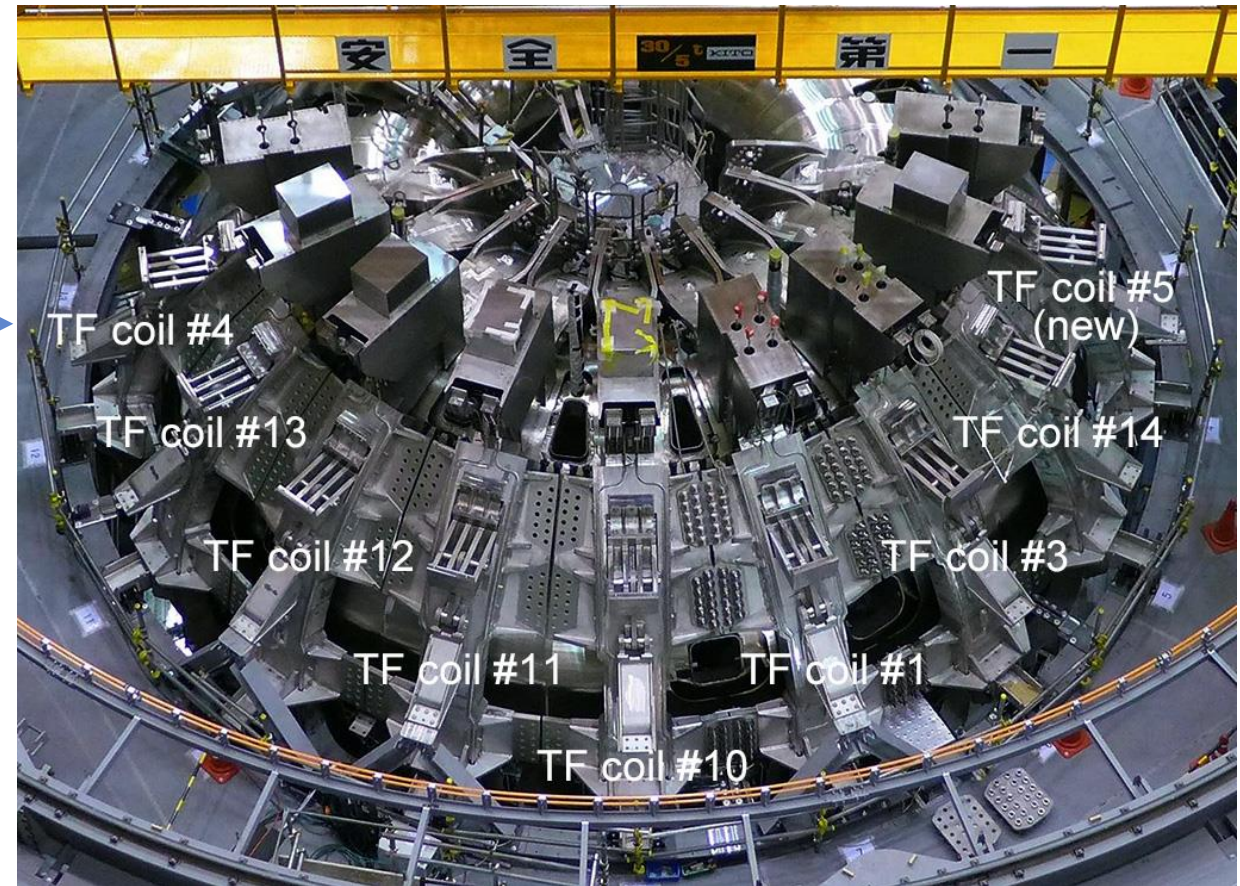
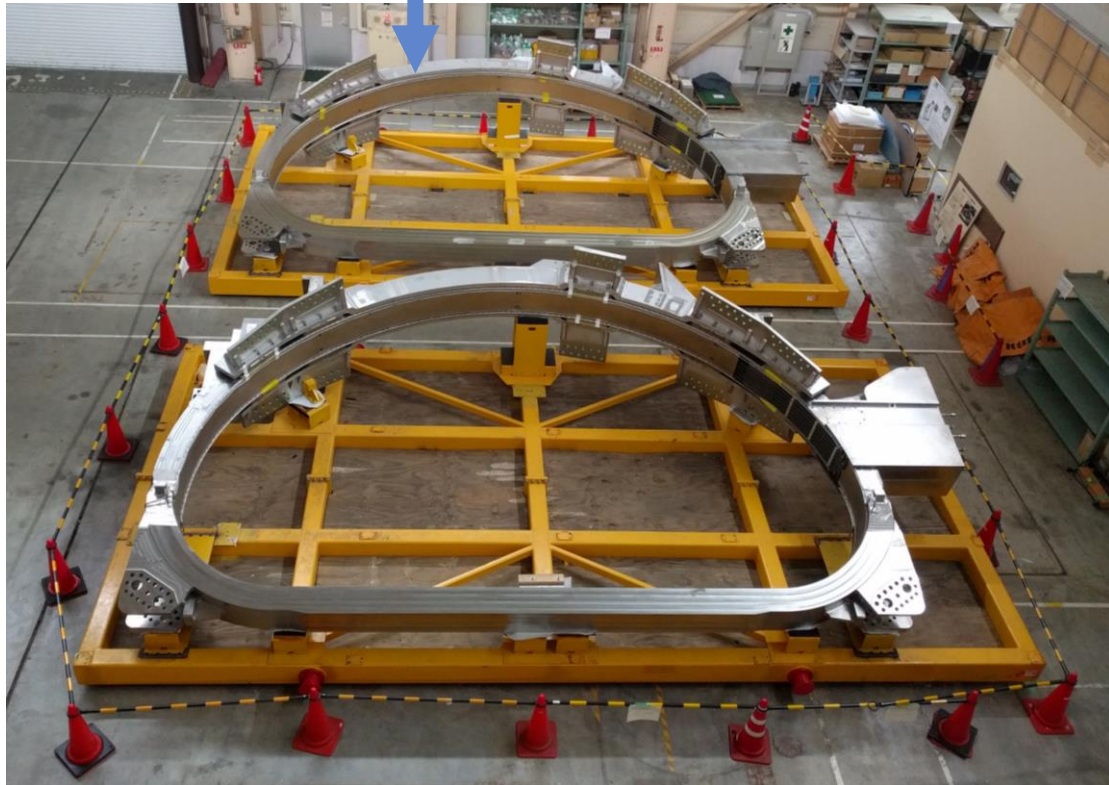
Width: 0.6 m

The high-precision manufacturing required a form error of 0.4 mm per metre.



SOFIA

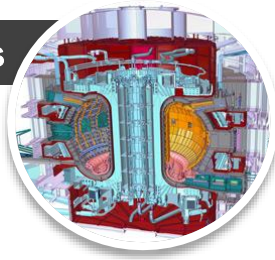
TFC - 4



23.000 T

3 x Eiffel
Tower

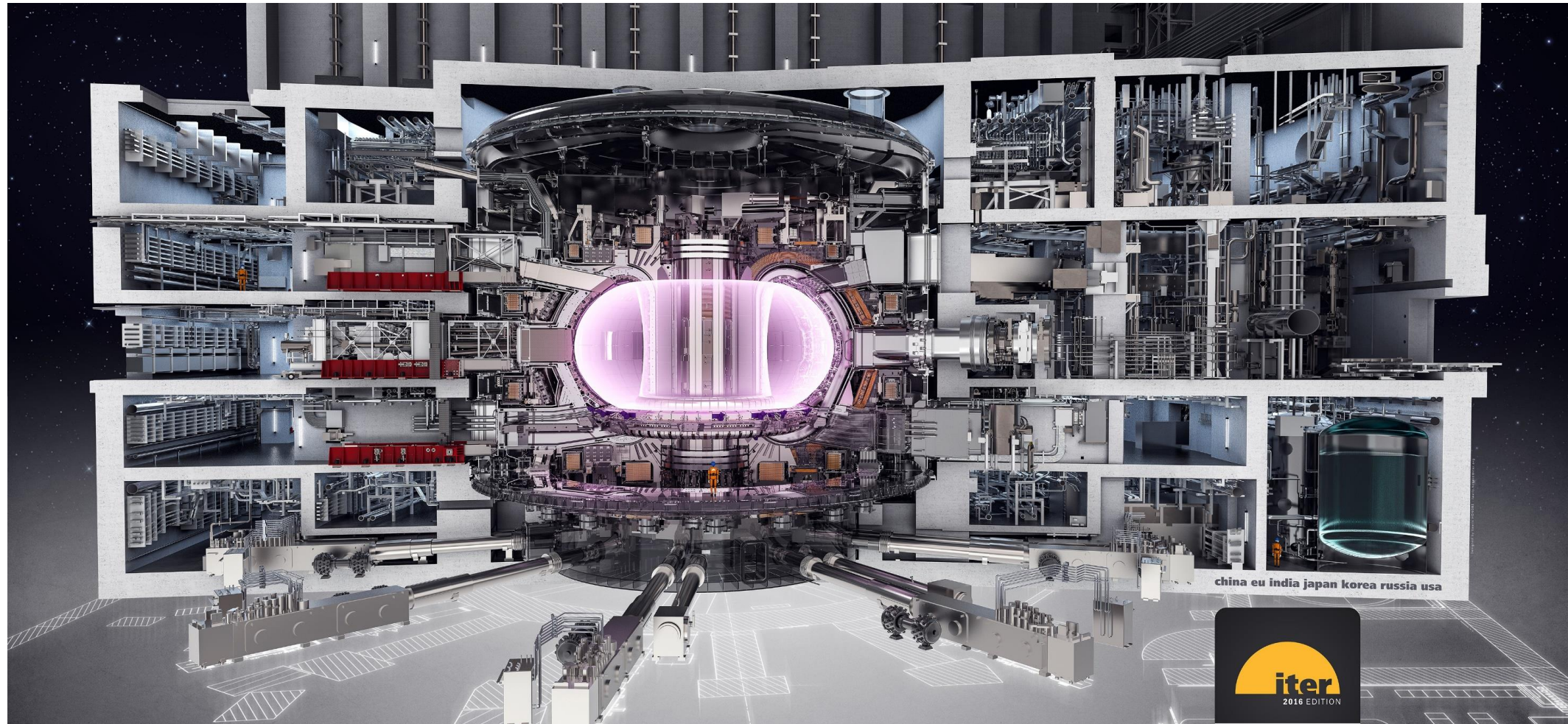
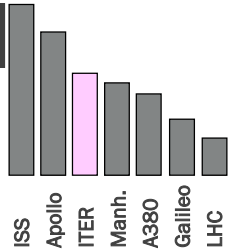
10 million components

ITER: 10^7
Airbus 380: 10^6 

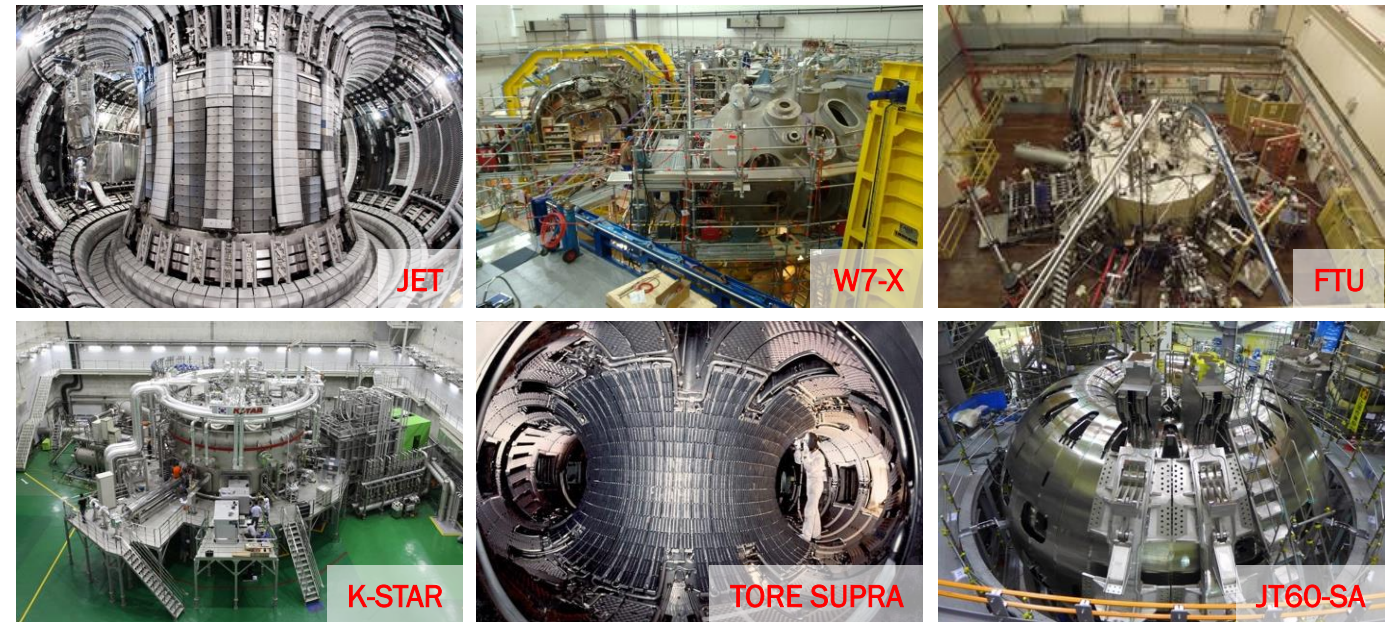
360 T

Every main magnet
weighs 360 T like fully
loaded Boeing 747-300

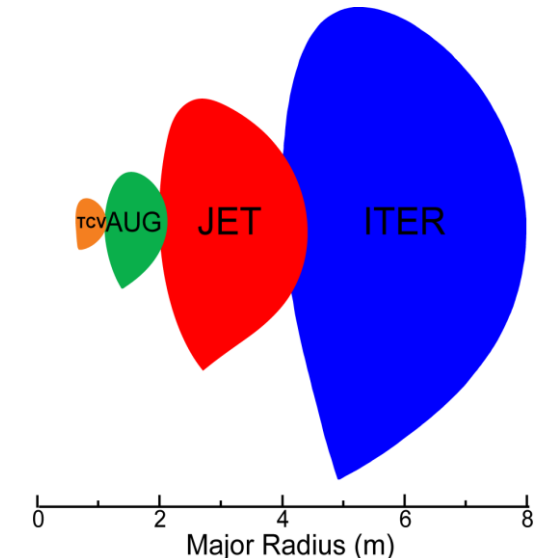
16+ Billion €

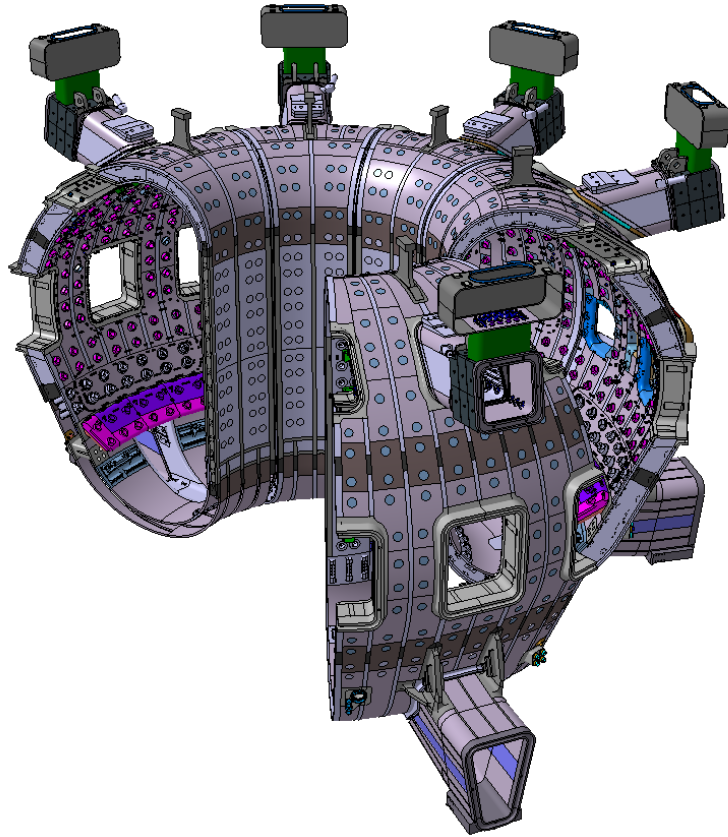
3rd most
expensive
project in history



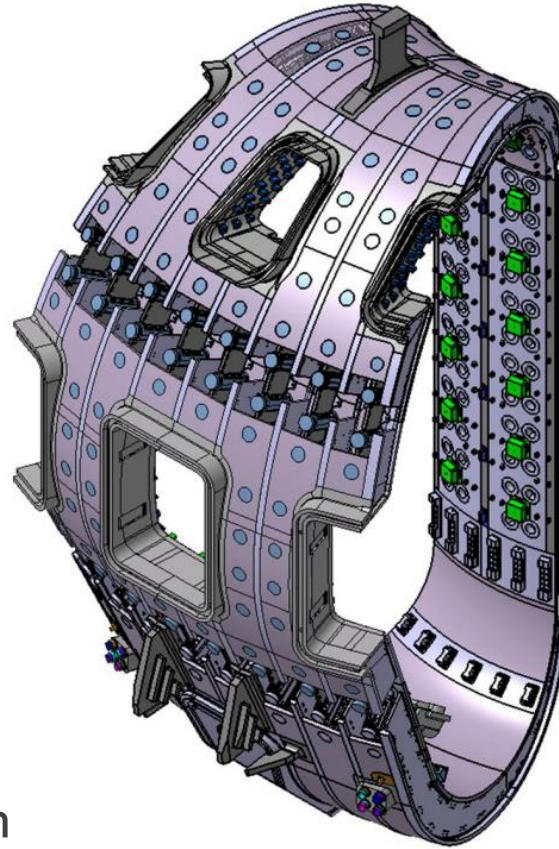


Work has already started in Europe for DEMO, in South Korea for K-DEMO, in China for CFR (China Fusion Engineering Test Reactor)



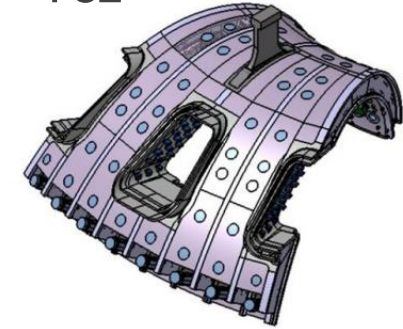


TYPICAL SECTOR

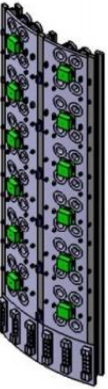


SEGMENTATION

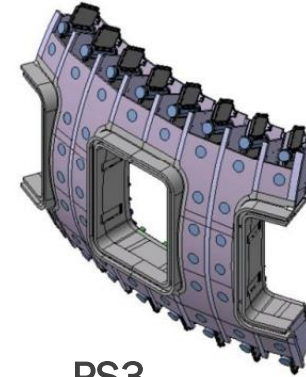
PS2



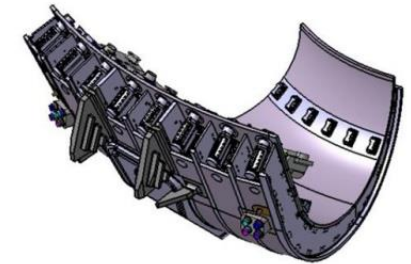
PS1



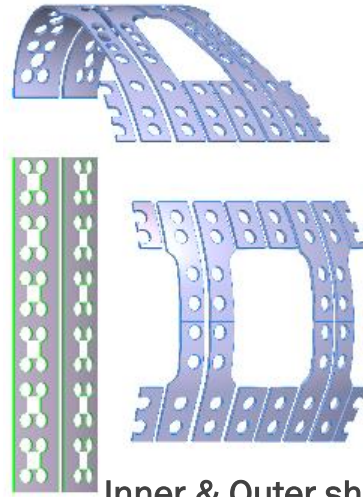
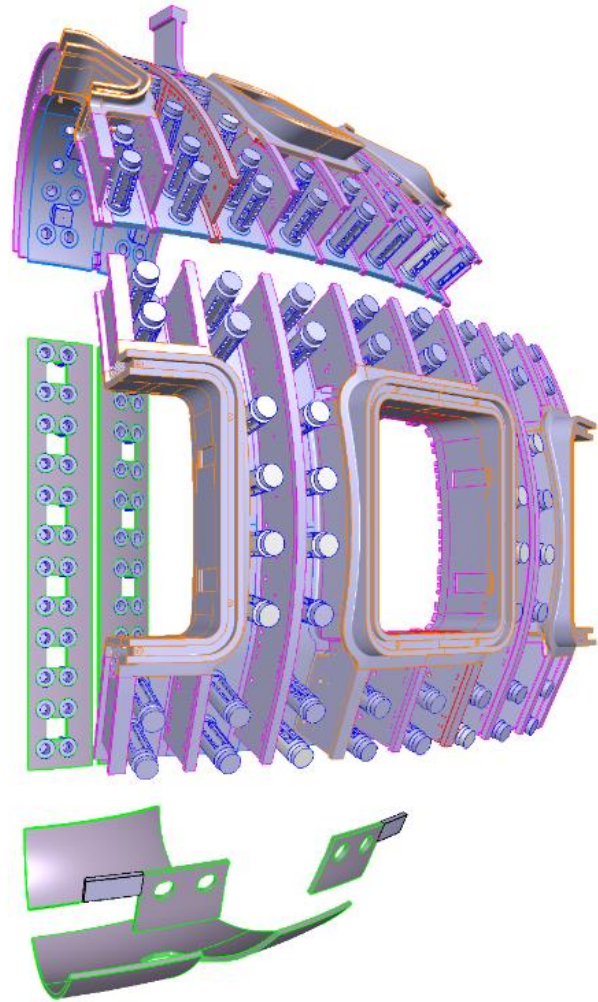
PS3



PS4



- ✦ The EU will supply 5 of the 9 ITER Vacuum Vessel sectors
- ✦ A class 2 nuclear component according to RCC-MR



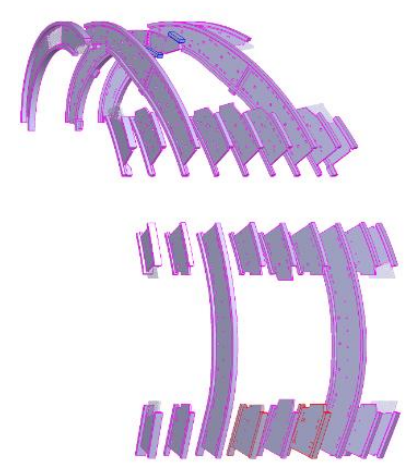
Inner & Outer shell



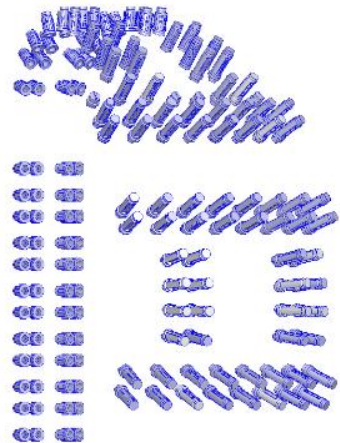
T-adaptors



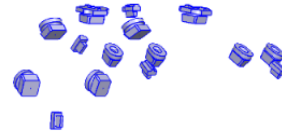
Webs



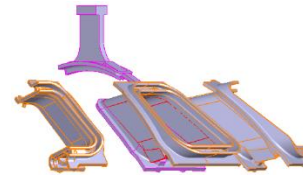
T-ribs



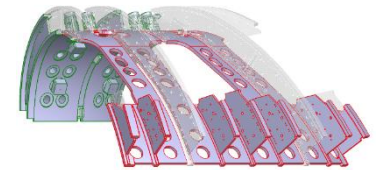
Flexible Housings



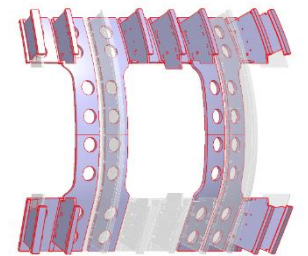
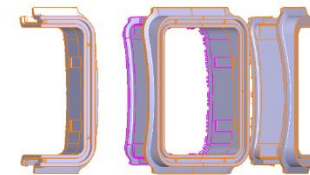
Keys

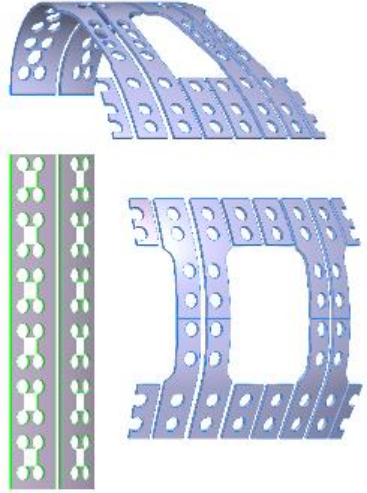


Ports

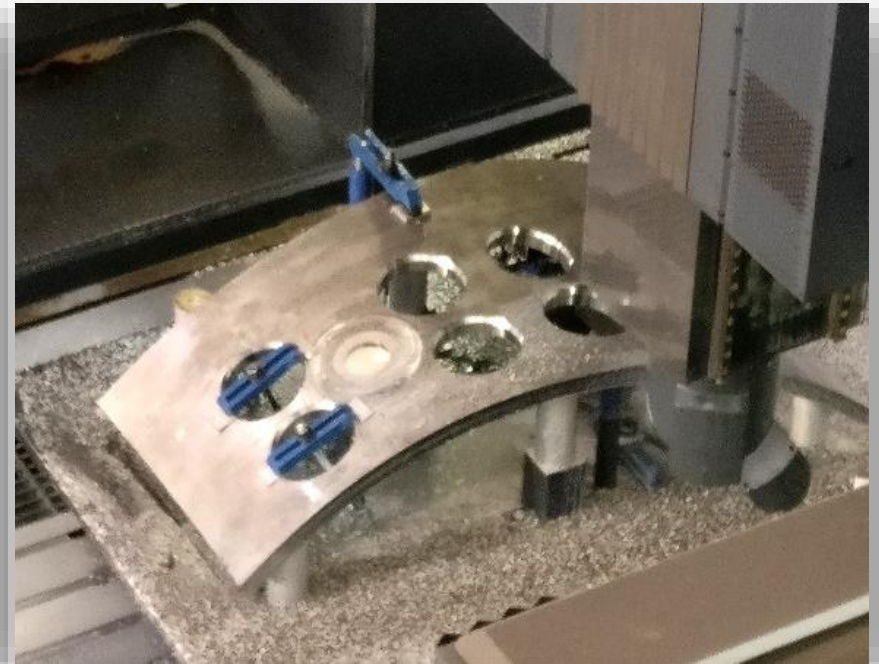


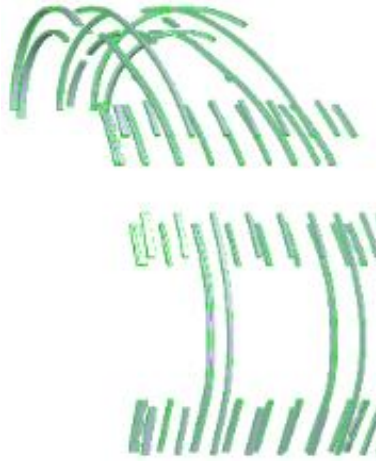
Sub-assembly



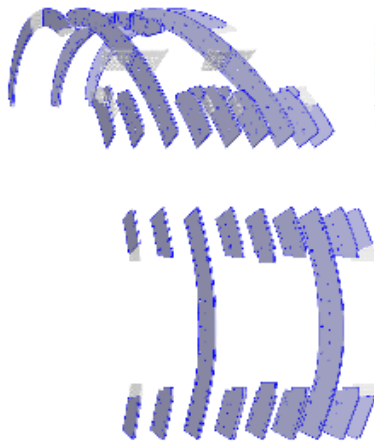


Inner shell

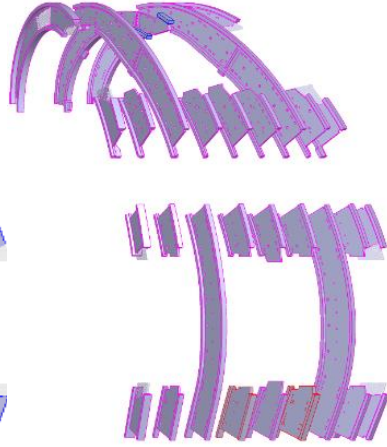




T-adaptors

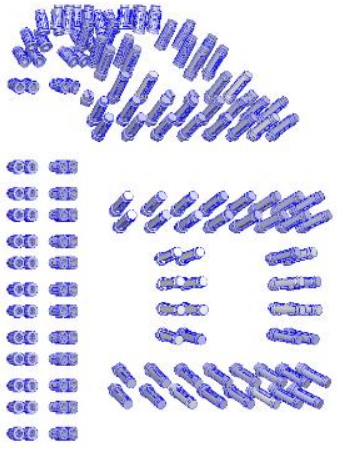


Webs

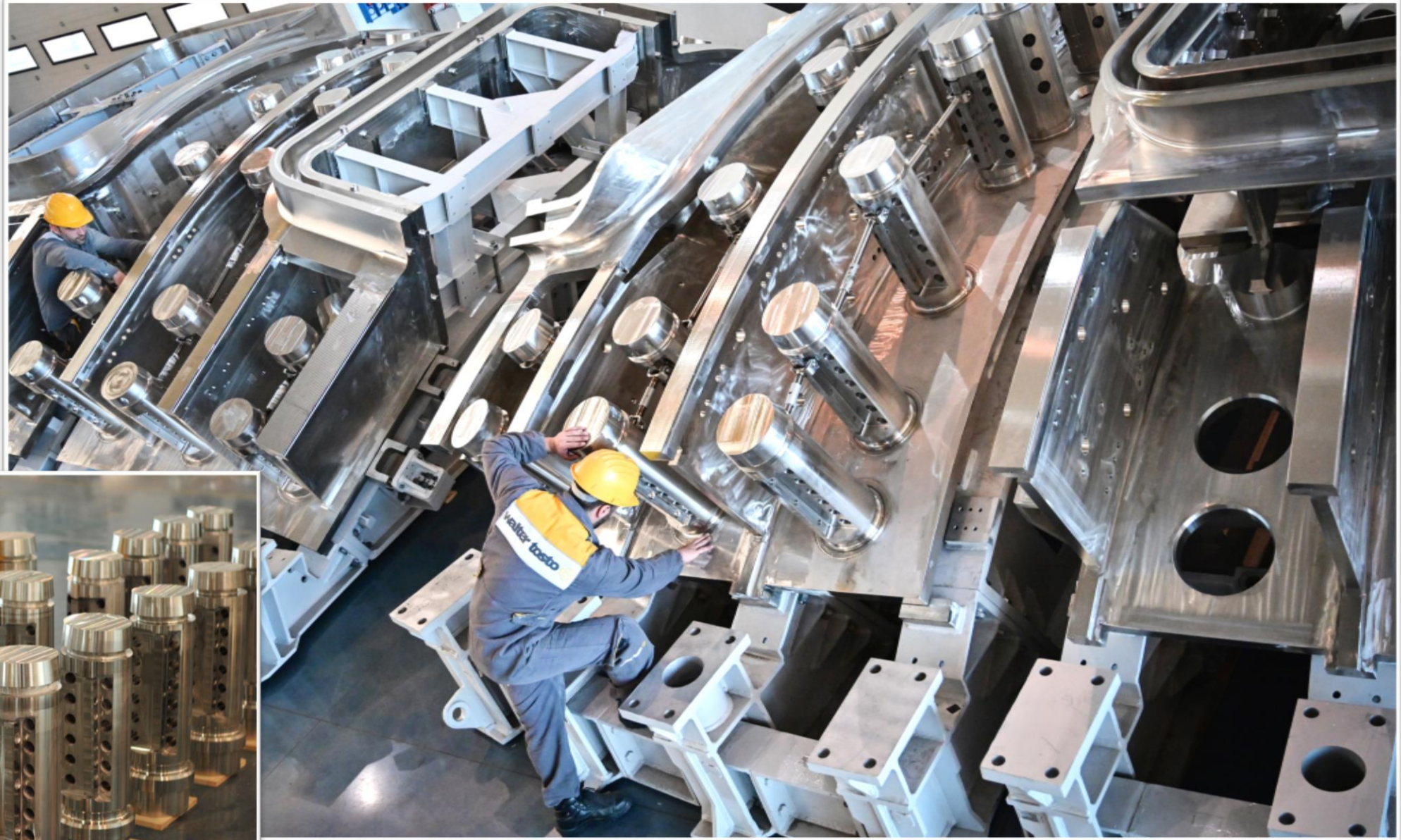


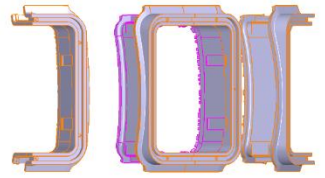
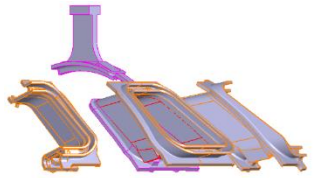
T-ribs



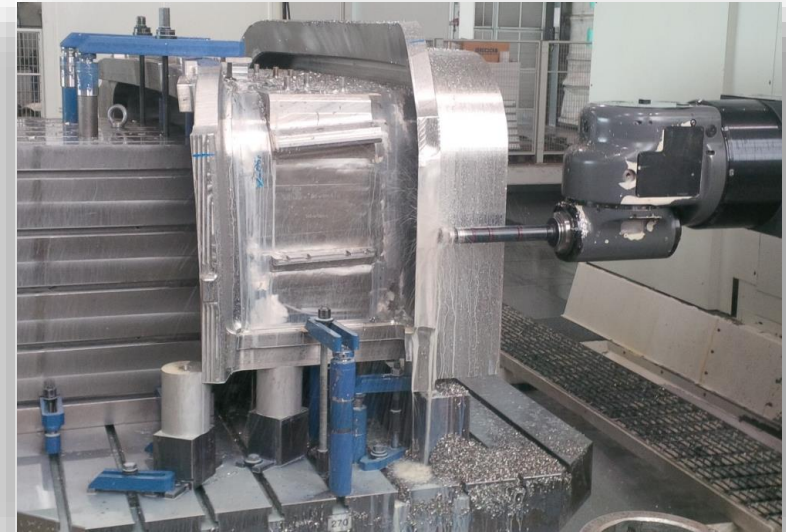
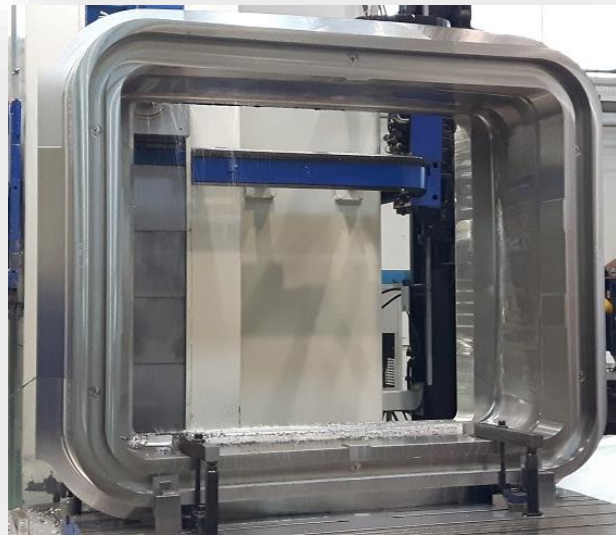


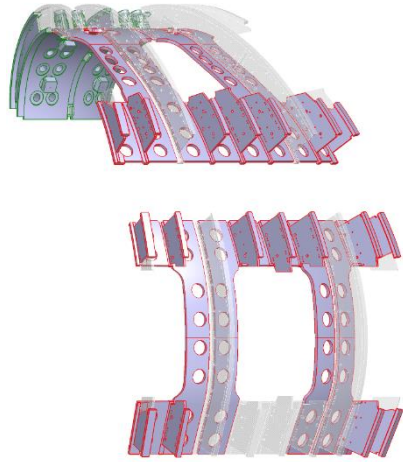
Flexible Housings





Ports

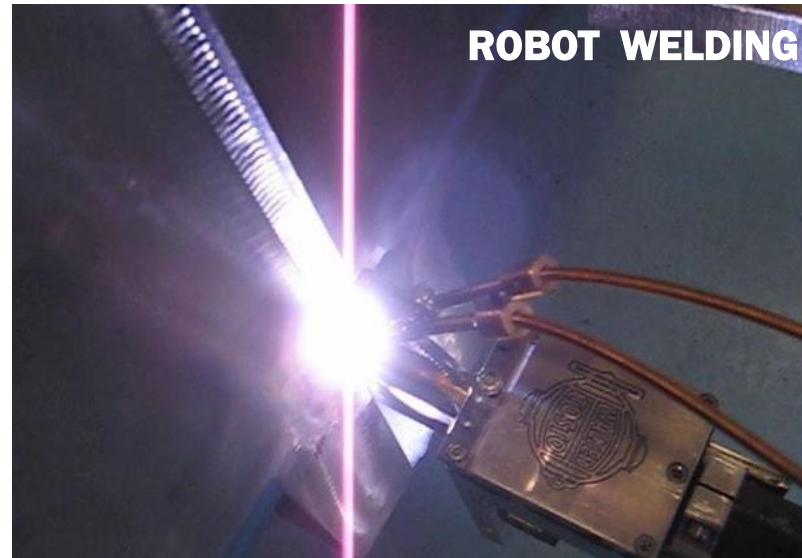




Sub-assembly





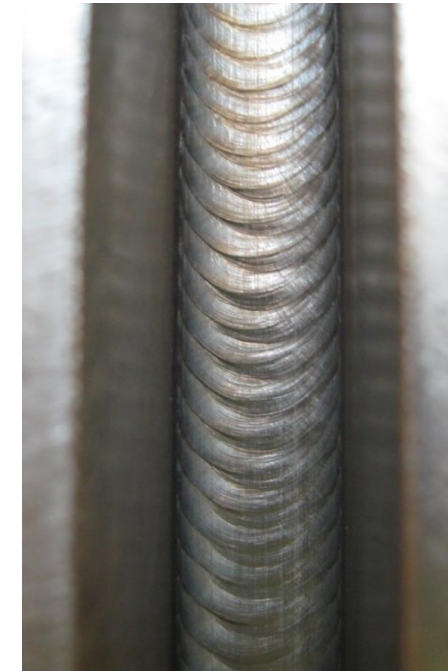
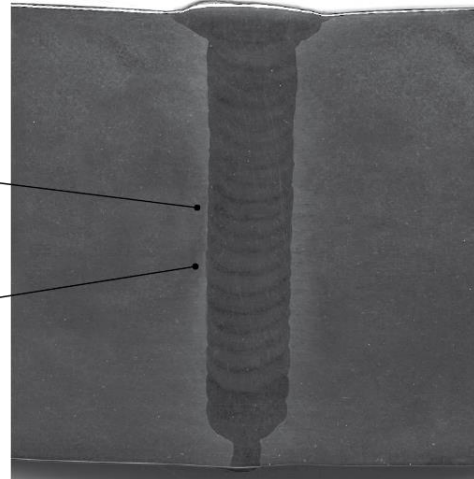


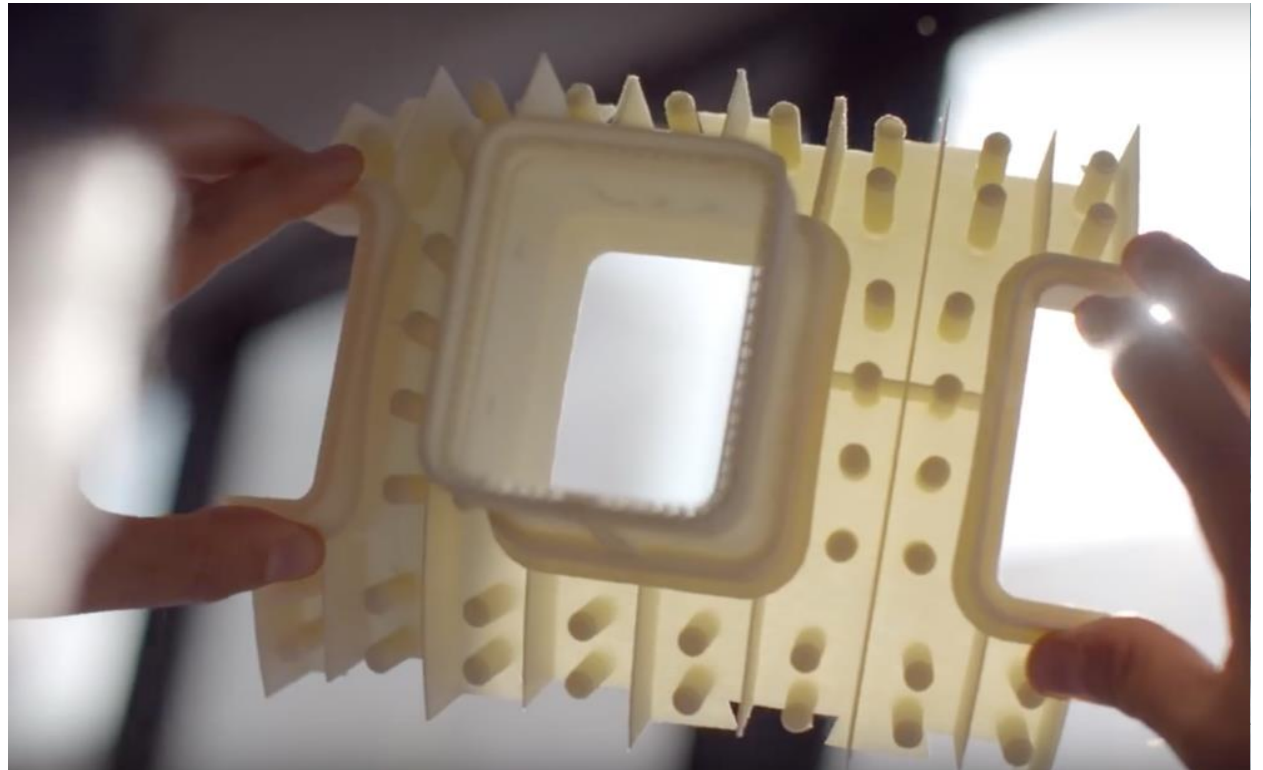
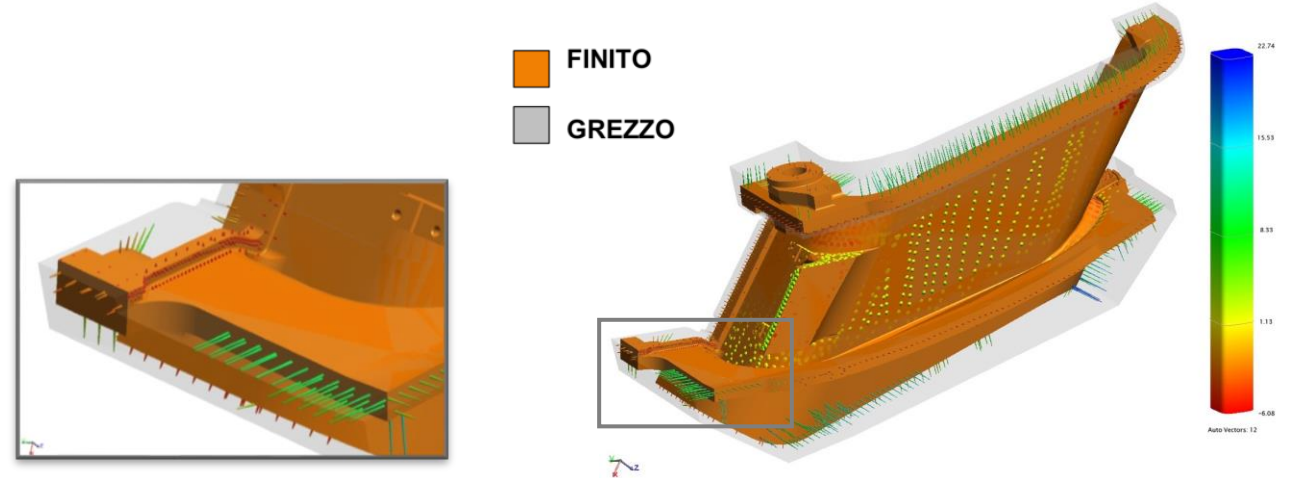
OPTIMIZED PROCESS

Better superficial finishing

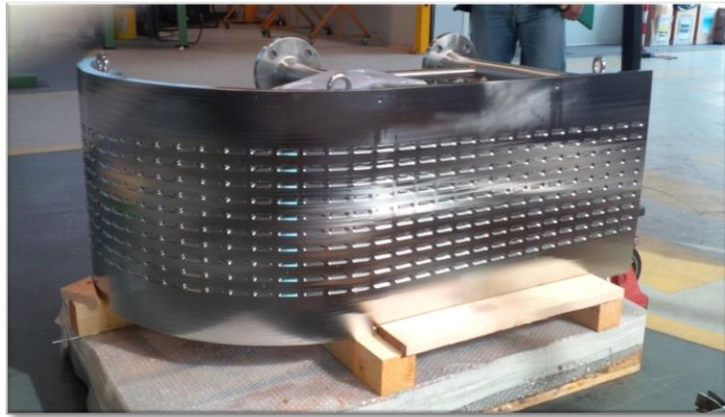
Regular
passes

Stratified
structure

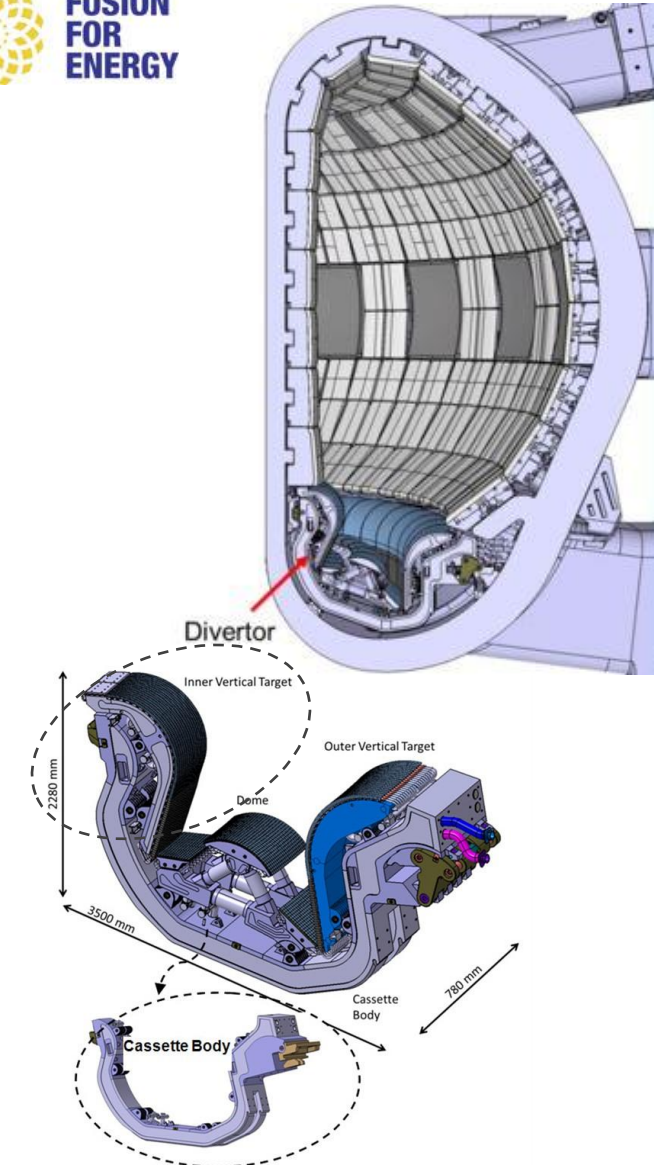








FUSION
FOR
ENERGY





Qualified by main nuclear stakeholders
Manufacturer of Critical Components
Hinkley Point C - UK

The nuclear industry needs young people

There is much to do in:

- Nuclear Decommissioning (UK, Germany, Belgium, Switzerland and Russia)
- Research of Generation IV and Fusion reactors (DEMO, DTT)
- Life Extension of existing Nuclear Plants
- New Nuclear Builds

Employers include:

- EPC companies
- Power Plant Operators
- Manufacturers
- Research organisations

Italy is the first supplier of Nuclear Fusion Technology.



**Piero Angela - RAI 1
Superquark 7 Luglio 2018**

«Noi italiani ci autoflagelliamo spesso, ma ci sono realtà nascoste che mostrano la nostra vitalità e capacità competitiva anche in campo di alta tecnologia come la Fusione Nucleare.

Le parti più complesse della macchina ITER vengono costruite proprio qui in Italia, ci sono aziende vincenti sul piano internazionale che fanno cose quasi da fantascienza ...

... qui siamo a Chieti, alla Walter Tosto»

Thank you

Ing. Mariantonietta Gabriele
Project Manager

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