

Toroidal and Poloidal Coils for FTU

FTU is a tokamak for nuclear fusion research, installed at the ENEA Centre of Frascati in 1987. The Company manufactured all toroidal (26) and poloidal coils (14), the coupling transformer, the electrical connections and took care of the final integration of the load assembly. Each toroidal coil is obtained from 42 wedge shaped copper disks, cooled down to -195°C . The particular shape of the coils and of their austenitic steel housing has caused machining and assembly problems and ground insulation difficulties, since earthing must be according to a peculiar geometrical shape exposed to high mechanical stresses. The poloidal coils are in spiral shaped 100 x 3.4 mm copper plate insulated with glass, kapton and epoxy resin. An additional circuit provides for liquid nitrogen cooling.



MAGNETS
FOR FUSION



MAGNETS FOR HIGH
ENERGY PHYSICS



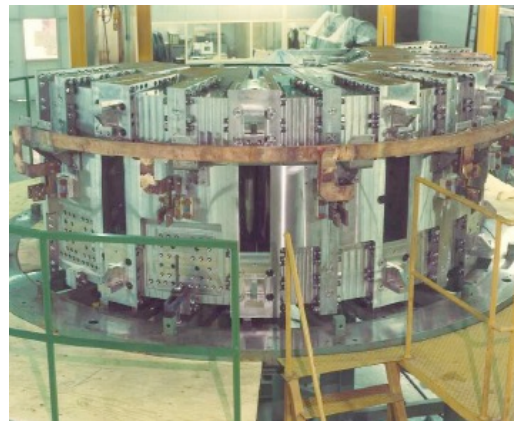
MAGNETS FOR
MEDICAL
APPLICATIONS



SYSTEMS
FOR ENERGY



SERVICES & REPAIRS



Toroidal coil modules blank assembly

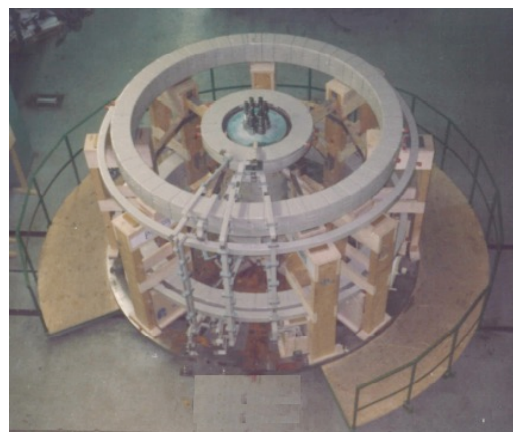


**Shrink fitting assembly
of one toroidal coil module**

TOROIDAL COILS

Maximum field in the centre	8 T
Stored energy	160 MJ
Type of winding	Copper spiral winding ϕ_e 1.040 mm, ϕ_I 750 mm
Nominal peak current	37.000 A
Conductor	ETP half-hard copper
Type of cooling	direct, liquid nitrogen
Coil weight	2.000 Kg

POLOIDAL COILS



Poloidal coil modules blank assembly

Type of winding	copper spiral winding ϕ_e 1.264 ÷ 3.224 mm, ϕ_I 784 ÷ 2.784 mm
Conductor	ETP hard copper
Type of cooling	nitrogen direct cooling