



world of transformers



┌ Marnate (VA) - ITALY ┐



┌ Stabio - SWITZERLAND ┐

┌ Busto Arsizio (VA) - ITALY ┐

TMC Transformers Group Company Information

Group Numbers:

- 180 Employees
- 100 Production
- 18 Engeneering team
- 15 Sales team

- Facility Busto Arsizio
 - Total 23.000 sq. m
 - Production 16.000 sq. m
 - Warehouse 4.000 sq. m
 - Office 3.000 sq. m
- Facility Marnate
 - Total 3500 sq. m
 - Production 3000 sq. m
 - Office 500 sq. m
- Sales Office Stabio (CH)
 - Office 200 sq. m



Dry type transformers & inductors

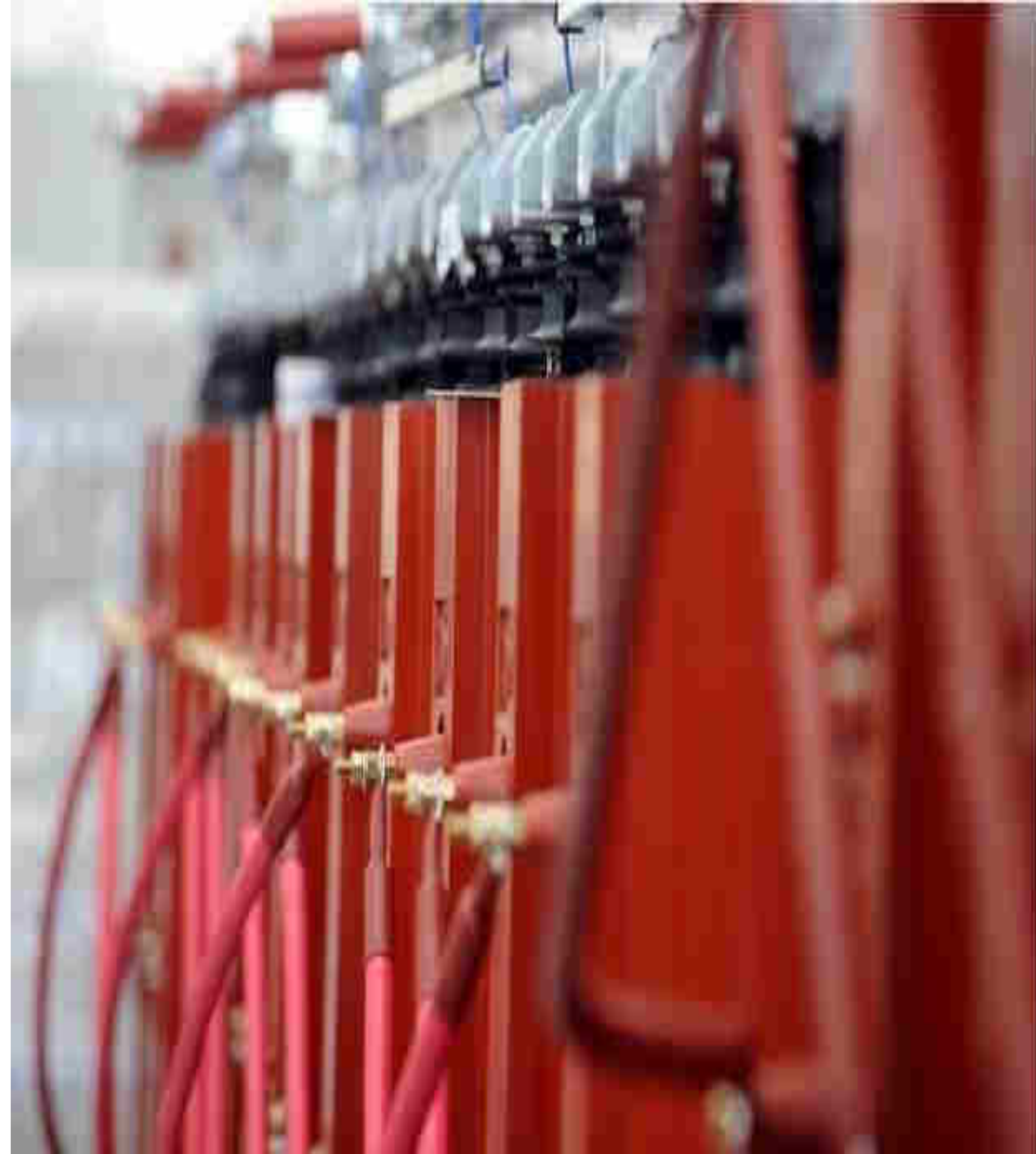
MV & LV Winding Technology

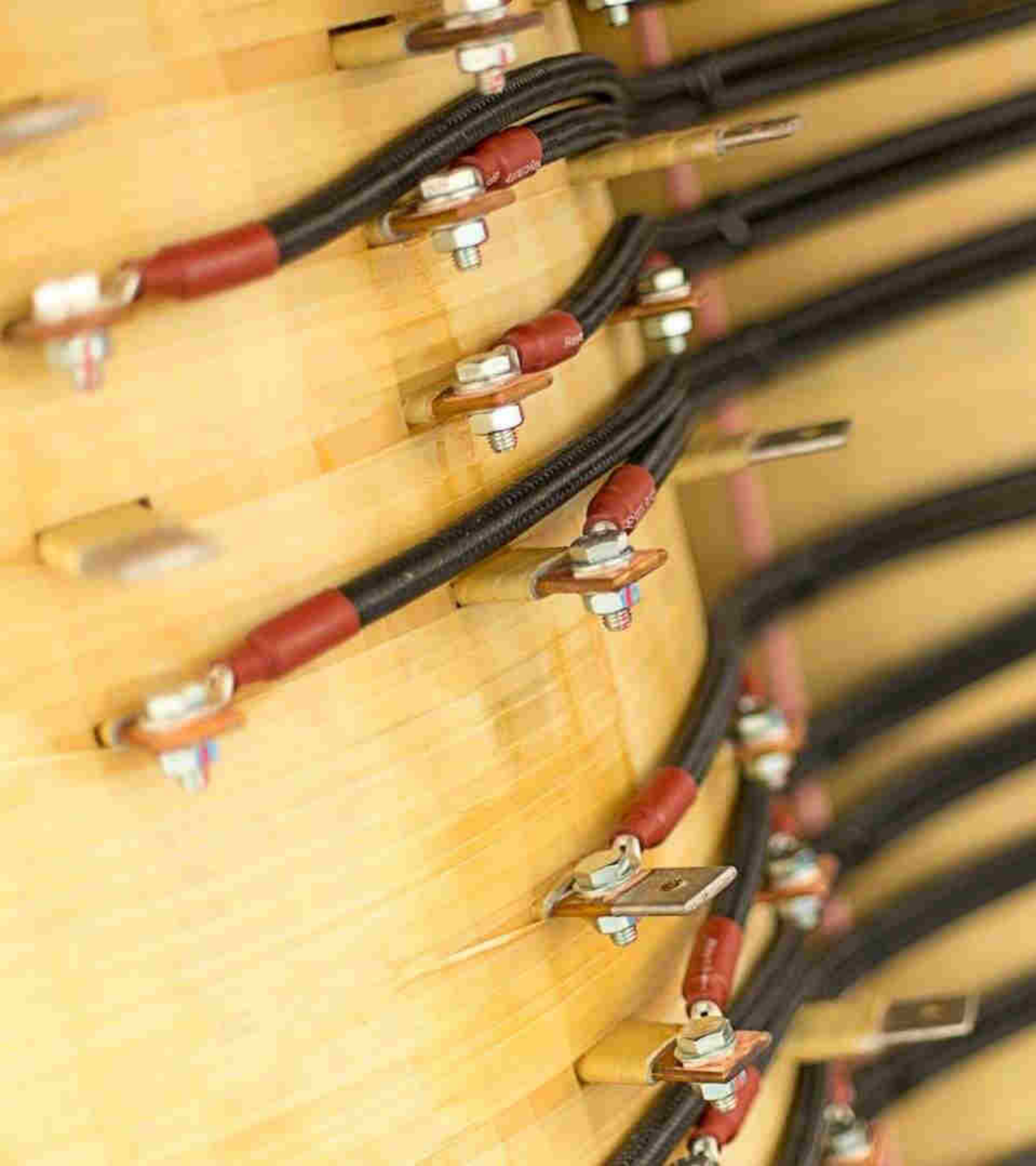


Cast Resin Technology

Key Points & Advantages

- Generally MV insulation system
<52kV and ratings <25MVA
- Combination of Cast Resin and Foil winding offers the ultimate in terms of dielectric performance and short circuit withstand.
- Winding in either **Aluminium** or **Copper**
 - No technical difference.
- Available in **Class “F” (155°)** or **Class “H” (180°)** resin systems.
- Axial air cooling channels ‘cast’ into coil for improved cooling and economy for ratings > 5MVA
- Selected LV applications
for Heavy Environmental pollution





VPI Technology

Key Points & Advantages

- Generally LV insulation system
< 7.2kV and ratings < 20MVA
- Vacuum Pressure Impregnation
- Processed in vacuum chamber – Resin initially introduced under vacuum and then placed under positive pressure to improve impregnation
- **Class “H” (180°)** thermal class material and axial cooling channels provide economical solution.
- Specialist Application Designs < 24kV
- Winding in either **Aluminium** or **Copper**
– No technical difference.
- Perfect solution for low voltage transformers and inductors
- Flame Retardant materials

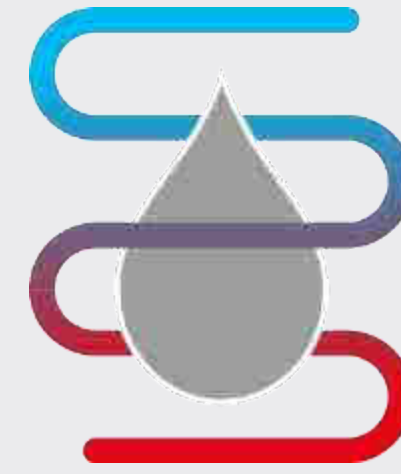
Liquid Cooled Technology

Key Points & Advantages

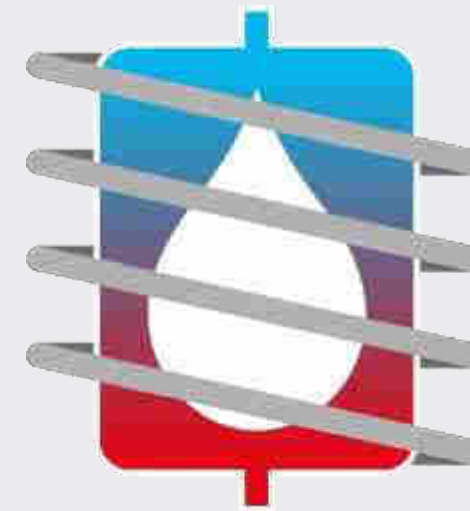
- The heat is removed far more efficiently than by air - providing a far greater power density and much reduced dimensions.
- The majority of transformer losses are dissipated into the water and not into the surrounding ambient air.

3 Types of water cooling:

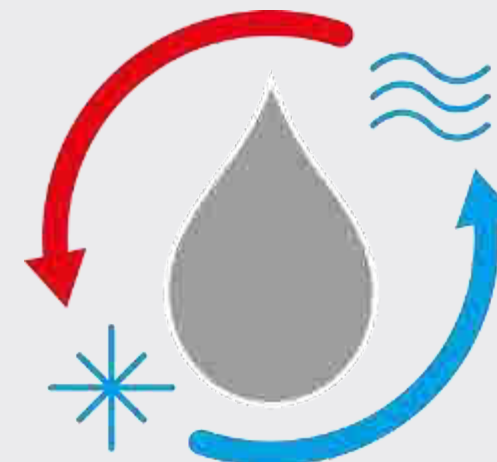
1. **DIRECT** Water cooling: Where the liquid (often deionized water) flows through the center of the 'hollow' winding conductor.
 2. **INDIRECT** Water cooling: Where a suitable heat sink containing a water circuit is embedded inside the winding or magnetic core.
 3. **AFWF Air/Water** cooling: Using an Air to Water heat exchanger where the cooling medium through the windings is air but the transformer losses are removed via an external AFWF forced water cooling circuit – Completely closed circuit cooling.
- High power density and compact dimensions
 - Highly efficient removal of heat
 - Heat dissipation to surrounding ambient greatly reduced
 - Closed circuit cooling system



DIRECT WATER COOLING



INDIRECT WATER COOLING



AFWF AIR/WATER COOLING

| Enclosures & Cooling Enclosures



- Ventilated IP21 to IP42
- Non Ventilated (Sealed) IP44 to IP56
- Specialist Application (Sealed) to IP66
- Enclosures designed for improved access during installation and maintenance using removable panels.
- Specialist designs for shock, seismic or marine application.
- Enclosure coating from standard industrial to C5M.

| Enclosures & Cooling

Cooling technology

- **AN or AN/AF** - Open circuit cooling with ambient air entering the enclosure
- **AFWF**: With enclosure mounted **Air to Water** Heat Exchanger
 - Closed circuit cooling with no interchange between cooling air inside enclosure and external ambient air.
 - 95% losses to Water / 5% to ambient air – Reduced HVAC requirement
 - Redundant cooling systems and / or emergency removable cooling panels
- **AFAF**: With enclosure mounted Air to Air Heat Exchanger
 - Closed circuit cooling as above but now the losses removed via air not water.
- **WF** - Direct or Indirect water cooling using fresh or deionized water





Dry type transformers & inductors
Testing Facility



Dry type transformers & inductors Testing Facility



Anechoic Chamber

Controlled Flow & Water
Temperature



400kV BIL Impulse

Routine testing

IEC/International Standards and Contract Specific Requirements

Type testing

Impulse Voltage (BIL) Withstand and Temperature Rise

Special testing

Climatic / Environmental, Acoustic,

Water Cooled Temperature Rise

Dry type transformers & inductors
Environmental | Climatic | Flammability

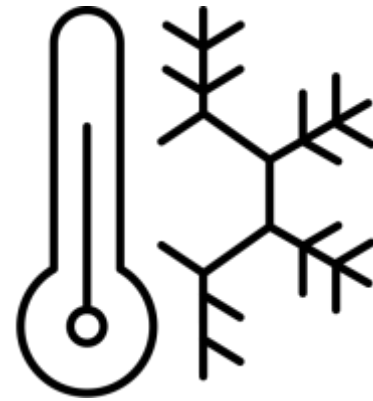
Dry type transformers & inductors Test Laboratory



E2

Resistance to
**Condensation &
Pollution**

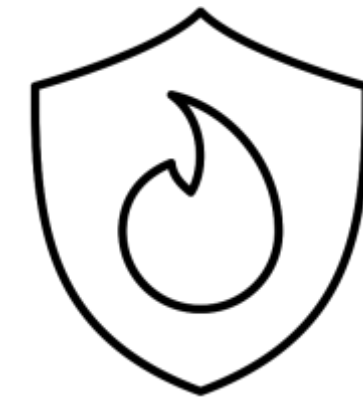
Heavy Pollution,
Frequent Condensation



C2

Resistance to
Thermal Shock

Thermal Shock Test
from -25°C



F1

Resistance to
Flammability

No significant contribution
to thermal energy;
No dangerous emission
of toxic substances

Two souls,
One company

Distribution and Special Applications.

Two very different souls combined together under a single roof to offer our customers the very best technology and service.



Special Line

To reach many diverse markets and provide a comprehensive range of products to different specialist applications like industry, marine, offshore, power generation.
A World of Transformers for every need.

Distribution Line

A tribute to the legacy of TMC Italia SpA, a world class production facility which has proven itself capable of consistently producing a very high quality and reliable product.



world of transformers

From 160kVA to 25MVA and system voltages up to 52kV.

- Catalogue Ranges -160kVA to 3150kVA and 36kV
- ECO Loss designs to EU 548-14
- Standard Loss designs to EN50541-1
- Copper or Aluminium windings
- **Class 'F' (155°)** or **Class 'H' (180°)** resins available
- 50Hz or 60Hz designs
- Project Specific designs from 160kVA to 25MVA and 52kV
- Cast LV windings for environmental protection
- Rapid Production capability
- Stock transformers





Marine

- Main Propulsion, Bow Thruster & Service
- Multi Pulse Harmonic cancellation
- MV and LV Drive systems
- AFWF IP54 Air / Water Heat Exchangers
- Fresh / Glycol / Sea Water Cooling
- Back Up / Redundant Cooling Systems

Off-shore

- Dynamic Positioning System
- Multi Pulse Drilling Drives systems
- Design for limited deck heights / foot print
- AFWF IP54 Air / Water Heat Exchangers
- Split coil design for coil removal in situ



world of transformers



Italy, Marine Industry

TMC Transformers supplies transformers utilized in the modification of two cruise liners. An additional 29 m long central section will be incorporated housing a mega lithium battery storage system to provide zero emission during port manoeuvres

N.4 Transformers

Year:

2018

4x Power:

2000 kVA – 0.69kV - 2x0.465kV

Cooling System:

AFWF

Enclosure:

IP23

Solar

- PV generation to HV Network
- High Efficiency Designs
- Dual Secondary Windings
- IP00 for Containerized Solutions

Wind

- High Power Density – Reduced Volume
- Custom designed for restricted installation height or foot print
- Water Cooled Solutions suitable to Minus 40C



world of transformers



Chile, Power Generation

Solution to replace Oil transformers in Outdoor Application.
No fire risk or contamination in the surrounding of the transformers

Year:	2019
N. 265 Transformers - Power:	2000 kVA
N. 25 Transformers - Power:	1250 kVA
Enclosure:	IP44
Outdoor Application	



world of transformers

Railways

- HV Track side Supply
- Suitable for Specific Traction Duty Cycles
- LV Aux On-Board power supplies
- Rolling Stock Mounted transformers (Underside)
- Protected from water/rain / brake dust
- Tested for Long Term traction shock / vibration

Infrastructure

- Major project construction
- Highways, rail networks, bridges and tunnels, Communication system
- Trams and metros
- Battery power storage facilities to support power networks
- Charging facilities for electric transport systems

Bolivia, Cochabamba metropolitan

Train to connect 6 cities in Bolivia at > 2000 meters height operation

42 kms train and 43 stations. 12 trains circulating at 80 km/hour.

21 traction transformers 1000 kVA

19 auxiliary transformers 150 kVA

Year 2018

Insulation level 36kV

Altitude of operation 2000m

Duty class VI

Decoupling factor < 0,2



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Data center

- 'K' Factor and High Harmonic designs
- High Efficiency
- Low Inrush Designs

Industry

- High Efficiency 'Green' industrial systems
- Multi pulse transformers for VSDs
- Heavy current (50kA) for Steel Production
- Transformers to feed, control and operate industrial electric power machinery



world of transformers

Germany, Aluminium Industry

Biggest aluminium rolling and remelt plant in Europe

Application for Rectifier

N.6 Transformers

Year:

2019

3 xPower:

4800 kVA - 30 kV – 2x1.1kV

3 xPower:

2800 kVA – 6kV – 0.99kV

Frequency:

50 Hz

Enclosure:

IP00



world of transformers

E-Mobility

- Full range of MV and LV solutions
- Special multi-winding designs
- Dedicated study to fit into special dimensions

Battery Storage

- Two, three or four winding transformers
- Dedicate FEA to study special cases
- Low losses



world of transformers

Nantes, France E-Buses

Substations of electric Busway 24-meter E-Buses Rapid Transit (Line 4), Batteries mounted on the roofs of the Nantes buses will be charged in 20 seconds with a boost of power at selected stops while passengers are embarking and disembarking.

Year:	2018
N. 6 Transformers – Power:	1600 kVA
Primary Voltage:	20 kV
Secondary Voltage:	2 x 0,37 kV
Frequency:	50 Hz
Enclosure:	IP31



Engineering
R&D



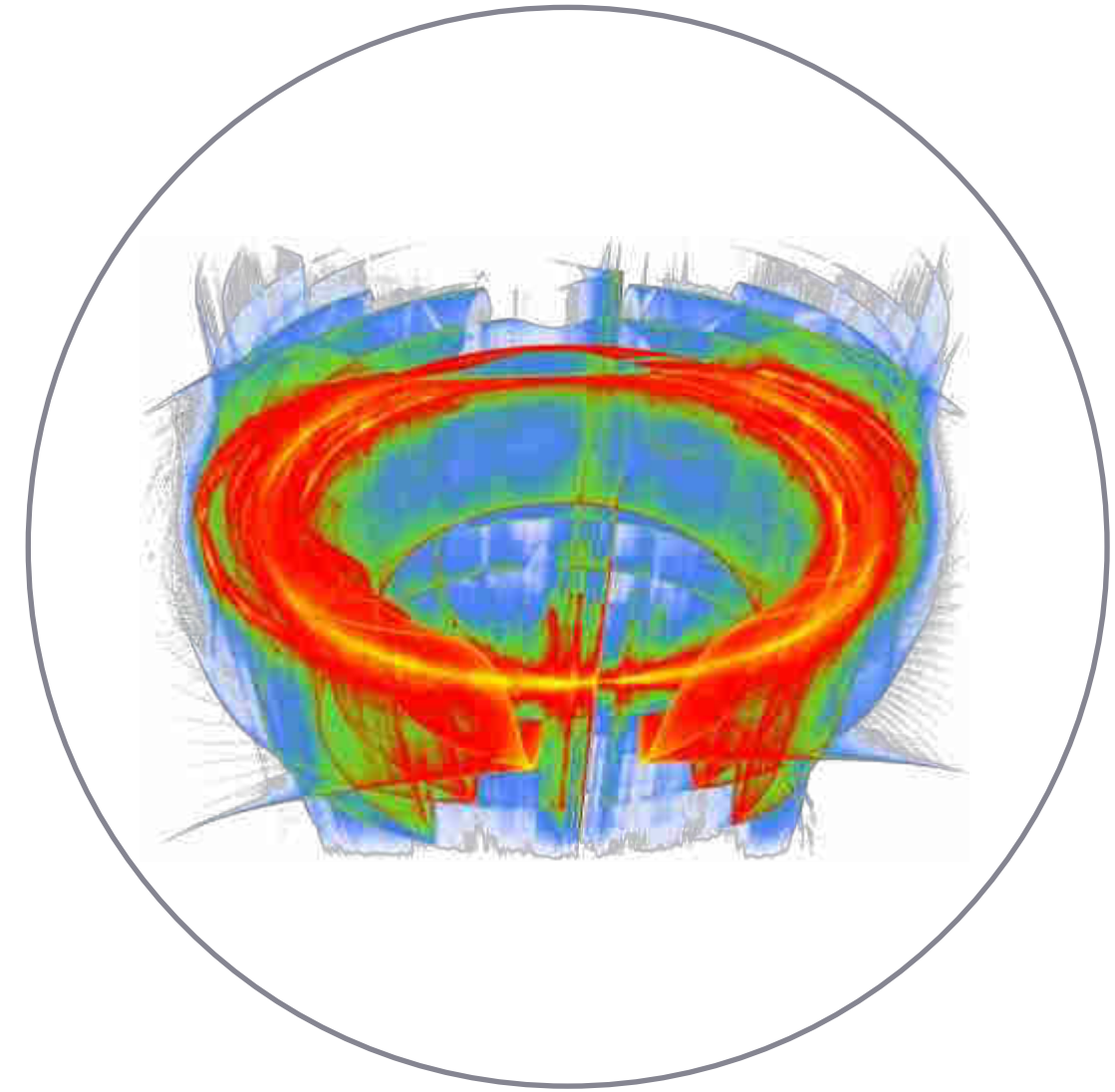
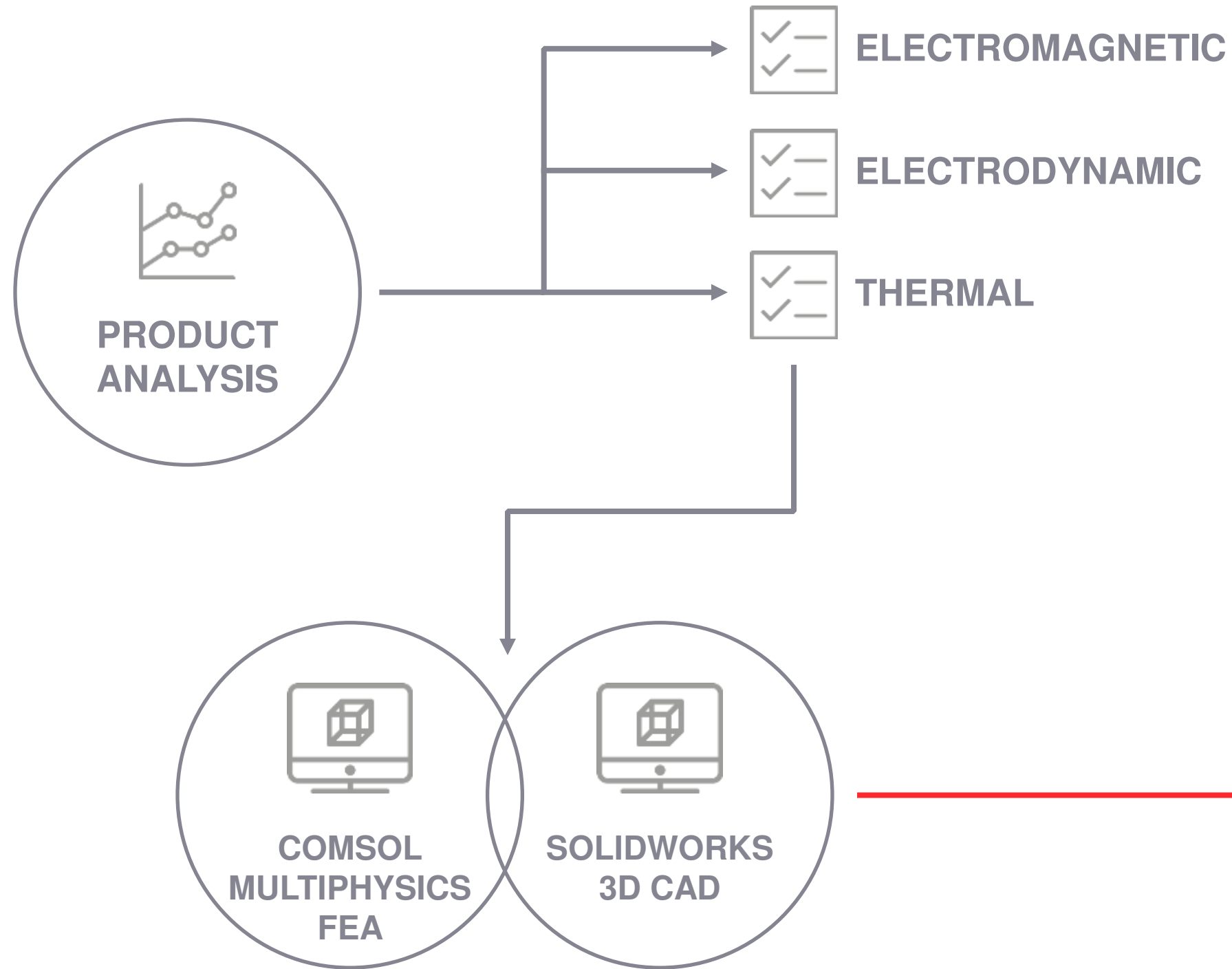
Engineering Team

- A carefully selected group of Electrical and Mechanical engineers.
- Engineers and Technicians selected from Specialist Transformer companies and Distribution Transformer companies across Europe.
- Vast experience in the design and manufacture of specialist transformers and inductors for Marine & Offshore, Wind, Rail and many other applications.

R&D

- R & D providing benefits both 'in-house' and to our customer base.
- Product excellence via extensive engineering development
- A 'Consultancy' for our customers
- Ensure customer product requirements always match or exceed their developing markets.
- Collaboration with Supply Chain to develop and utilize the most innovative materials in the most cost effective way.
- Ensure a steady flow of ideas and solutions to solve the challenges of the future.

Engineering R&D FEA



Certifications

Transformers designed and manufactured in line with all national and international standards, tested and inspected with all major external inspection bodies.



Thanks.

Our contacts



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Different Characters,
only One Identity

www.nexttechnologygroup.com



Transformer & Inductor Manufacturer



Transformer & Inductor Manufacturer



MES Software solutions



Product Modeller and Configurator



Industrial consulting
design & engineering