

# ENGINEERING CAPABILITIES FOR POWER TRANSFORMERS

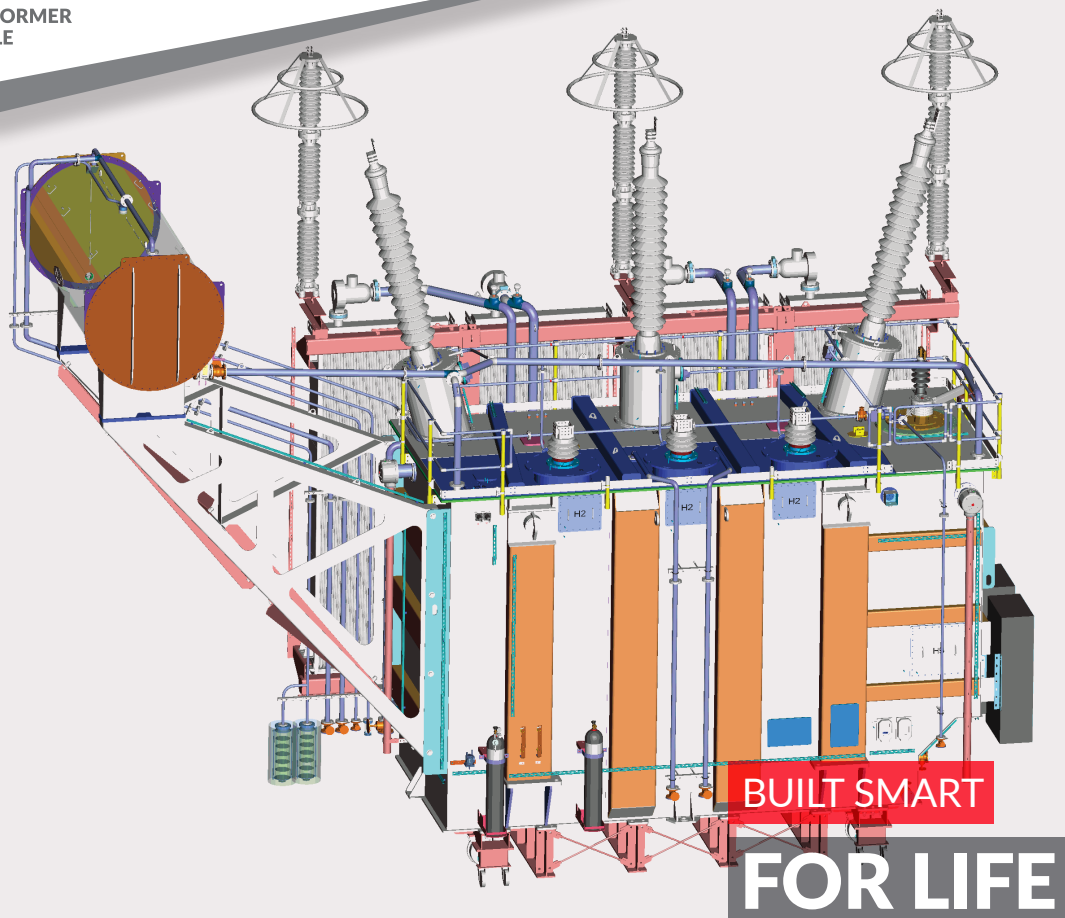
For more than 80 years Wilson Transformer Company has been designing and building superior transformer products and providing life-time management services. We are committed to support our local and global customers by delivering the most reliable and high quality products that meet our customers' requirements.



THE TRANSFORMER  
PEOPLE

## KEY FEATURES

- > Safety in Design
- > Customer Focused
- > Standards Compliance
- > Innovative Solutions
- > World Class Capabilities
- > Sophisticated Software
- > Whole of Life Value



Wilson Transformer Company has become a leading specialist in the delivery of transformer solutions. We offer our customers the confidence of proven designs coupled with state of the art manufacturing facilities, robust processes and compliance to Australian and/or International standards, including but not limited to AS2374, IEC60076, ANSI C57 and BS171. By using the latest design software, analytics and manufacturing technology, we engineer and manufacture our products in clean work environments incorporating strict quality control measures in all the critical processes.

We have extensive experience in designing various types of power transformers, including:

- Auto Transformers
- Substation Transformers
- Generator Step-up Transformers
- Regulating Transformers

- Rectifier & Furnace Transformers
- Traction and Trackside Transformers
- SVC Transformers
- Phase Shifting Transformers
- Fault Current Limiters.

All power transformers use circular, stacked step-lap cores. A range of winding types are used including layer for smaller power transformers, helix, multi-start helix tapping windings to reduce short circuit forces, and disc windings for larger power transformers.

In order to optimise the electrical and mechanical design of our products, we use software ranging from tender optimisation programs and detailed in house developed programs to sophisticated finite element modelling (FEM) including VIT, ANSYS (Mechanical CFD electromagnetic), and PTC CREO ProE for mechanical 3D solid modelling.

## ELECTRICAL DESIGN

The electrical design is completed using various software ranging from the tender optimisation program to sophisticated finite element modelling (FEM) including VIT and ANSYS.

Our design philosophy includes a rigorous process which involves:

- Electrostatic field analysis to optimise the insulation structure for various test conditions like Induced overvoltage test, partial discharge test, switching Impulse and lightning Impulse tests,
- Electromagnetic field analysis to control stray magnetic fields and avoid hot-spot temperatures within windings , leads , mild steel clamps and tank structures,
- Impulse Voltage response within windings,
- Finite element analysis for mechanical stress under short circuit, oil flow and temperature distribution.

## MECHANICAL DESIGN

Our mechanical designers complete the internal and external design of a transformer. The following design aspects are thoroughly addressed:

- Clearances for test voltages
- Mechanical strength for lifting
- Short circuit strength
- Transport and earthquake conditions
- Vacuum and pressure withstand
- Transport and site mass
- Dimension constraints and
- Customer fitting requirements

3D solid modelling, FEM structural/thermal analysis of critical components and other linked programs are used to complete the mechanical design including ANSYS (Mechanical CFD electromagnetic) and PTC CREO ProE software.

## CONTROL

For power transformers, secondary control wiring is designed using E3 software to create the control schematics, terminal plans, BOM, label lists & wire lists, as well completing the design of control panels, including layouts and wiring.

Design reviews with our engineering team can be performed at either our manufacturing facilities or our customer's offices.

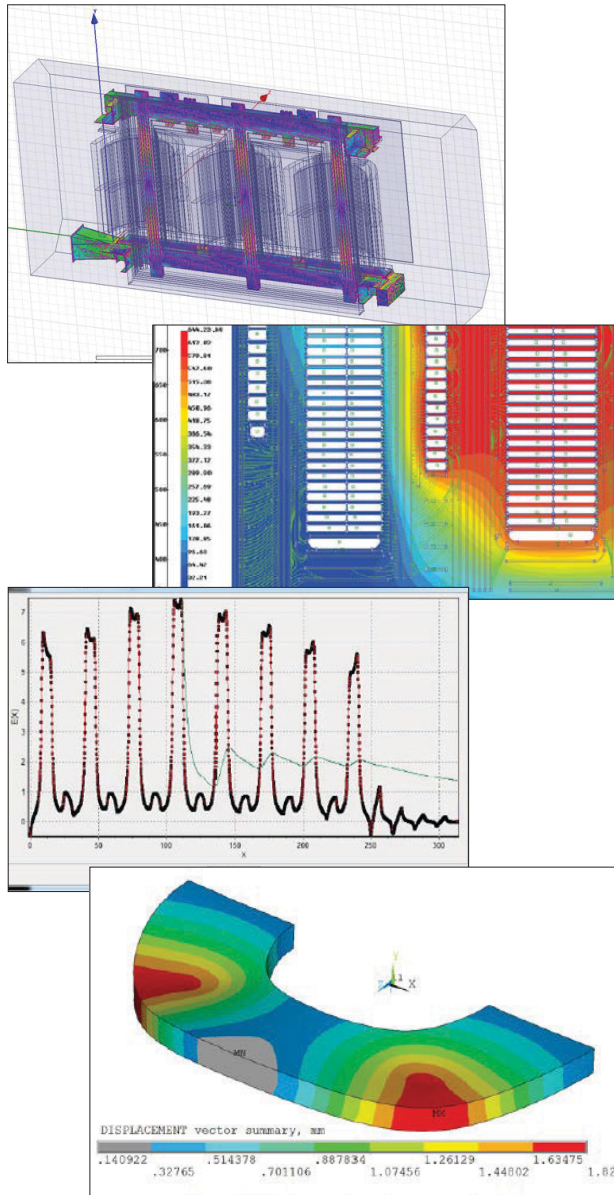
## REFERENCE LIST

Some of the power transformers we have designed:

MVA	kV	Type
550	330/132/22	Auto transformer
360	33/36.3-3.3	Regulating transformer
260	220/110/11	Auto transformer
240	275/132/33	Auto transformer
225	230/20	Generator transformer
135	22/22/2.2	Generator transformer

120	275/33	Step-up transformer
106	33/2-0.33	Furnace transformer
100	132/45.47	Trackside transformer
93.4	66/1.01-1.01	Rectifier transformer
90	330/33	Generator transformer
75	132/11	Step-down transformer
17	127/11	Single-phase transformer

## EXAMPLES OF OUTPUT



For information about our capabilities, please visit:  
<http://www.wtc.com.au/your-requirements/world-class-capabilities/>

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Built Smart for Life