

Power Transformers

Product Catalog

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Transforming the Future of Energy

Indonesia's leading manufacturer of
power and distribution transformers



SINTRA is a market leader in the design, manufacturing, and testing of power transformers up to 150 MVA and 150 kV.

Power transformers are most commonly used at substations or industrial sites where high voltage levels in transmission lines carrying 500 kV, 275 kV, or 150 kV are converted to 20 kV of power for industrial use.

SINTRA has designed, manufactured, and delivered numerous units of 60 MVA and 30 MVA 150 kV-class power transformers to PT. PLN (Persero) in accordance with the strict SPLN standards of the state-owned power company.

Furthermore, SINTRA has supplied various power transformers to private sector businesses in Indonesia that produce pulp and paper, fiber, glass, textiles, chemicals, iron and steel, ... etc to power those respective industries.



Product types for **PT. PLN (Persero)**



3-Phase 30 MVA
150/22 kV YNyn0+d



3-Phase 60 MVA AIS
150/22 kV YNyn0+d



3-Phase 60 MVA GIS
150/22 kV YNyn0+d

Customized Product Types for **Private Sector Customers**



8,000 kVA



12,000 kVA



120,000 kVA (150 kV)

Design

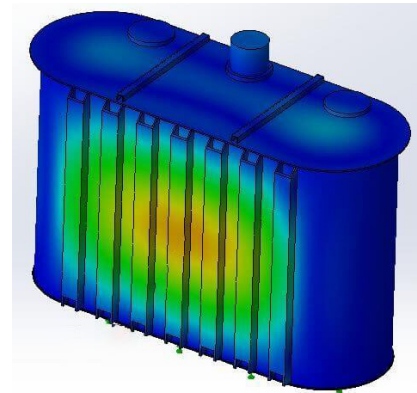
The remarkable design characteristics of SINTRA's transformers ensure that they can perform under the most demanding of conditions.



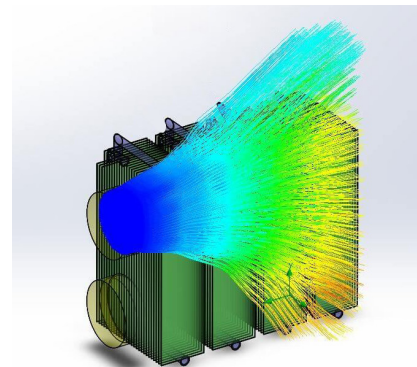
The design team at SINTRA employs a variety of advanced design software and simulation tools to engineer the most reliable and high-performance transformers.

SINTRA's design advantages include the following:

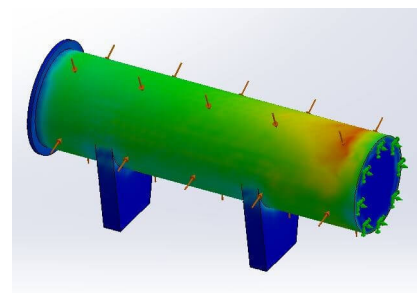
- High mechanical strength
- High short-circuit withstand capability
- Low partial discharge
- Low noise level
- Low loss
- Low temperature rise
- No leakage



Stress and deformation analysis at vacuum pressure



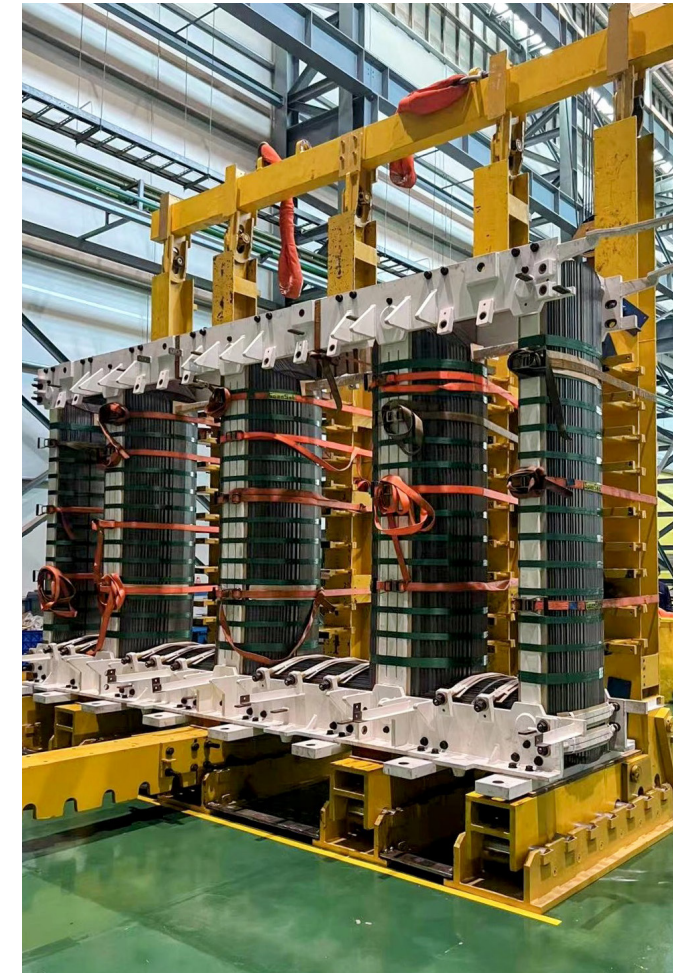
Temperature simulation of radiators and fans using Computational Fluid Dynamics (CFD)



Study of von Mises stress using Finite Element Analysis (FEA)

Core & Windings

Continuously transposed conductors (CTC) are used for both primary and secondary windings. The advantages of CTC include high mechanical strength, high short-circuit withstand capability, and low loss.



Net-wrapped CTCs are also used for more effective heat dissipation and economical sizing of the overall transformer. Grain-oriented electric steel (GOES) sheets up to grade 0.75 are stacked using step-lap joint method to create a smooth magnetic flux path.

This allows the stacked core to exhibit exceptional properties like low iron loss, low excitation current, and high mechanical strength.



Assembly & Drying

All assembly procedures are done in a dust-free, safe, and comfortable working environment.

Remarkably, SINTRA uses Vapor Phase Drying (VPD) technology for effective moisture removal from transformer insulation material. This process guarantees high insulation strength of the active part.



Before oil injection, the tank is also vacuumed to safeguard the active part and all insulation materials are optimally oil-impregnated. Meticulous handling at every production stage is critical in guaranteeing that the products operate at only tens of pico-Coulombs of partial discharge.



Testing

SINTRA's testing system is one of the best for electrical products operating up to 150kV.



Our state-of-the-art testing facility houses a variety of advanced testing equipment and software that can complete a variety of test items to high precision and accuracy.

These test items include, but are not limited to, the following:

- High mechanical strength
- Measurement of no-load loss and no-load current
- Lightning impulse test
- Line terminal AC withstand test
- Induced voltage test with partial discharge measurement
- Temperature rise test
- Functional test on control equipment and accessories
- Zero sequence impedance measurement
- Measurement of frequency response (SFRA)

Rated Power	Voltage	Connection	No-Load Loss	No-Load Current	Loaded Loss	Impedance	Noise		Partial Discharge	Temperature Rise	
(kVA)	(kV)		(kW)	(%)	(kW)	(%)			(pC)	(K)	
100000	150/66/10	YNyn0+d	40	0,2	210	12,5	ONAN ONAF	≤ 67dB (0.3m) ≤ 71dB (2.0m)	70	Oil Winding Hottest	≤ 50 ≤ 55 ≤ 68
60000	150/66/10	YNyn0+d	30	0,2	130	12,5	ONAN ONAF	≤ 67dB (0.3m) ≤ 71dB (2.0m)	70	Oil Winding Hottest	≤ 50 ≤ 55 ≤ 68
60000	150/22/10	YNyn0+d	28	0,2	115	12,5	ONAN ONAF	≤ 67dB (0.3m) ≤ 71dB (2.0m)	70	Oil Winding Hottest	≤ 50 ≤ 55 ≤ 68
60000 (GIS)	150/22/10	YNyn0+d	28	0,2	115	12,5	ONAN ONAF	≤ 67dB (0.3m) ≤ 71dB (2.0m)	70	Oil Winding Hottest	≤ 50 ≤ 55 ≤ 68
30000	150/22/10	YNyn0+d	18	0,2	67	12,5	ONAN ONAF	≤ 67dB (0.3m) ≤ 71dB (2.0m)	70	Oil Winding Hottest	≤ 50 ≤ 55 ≤ 68
30000	66/22	YNyn0+d	18	0,2	67	12,5	ONAN ONAF	≤ 67dB (0.3m) ≤ 71dB (2.0m)	70	Oil Winding Hottest	≤ 50 ≤ 55 ≤ 68

SPLN T3.007:2016/2017

Since establishment, SINTRA has manufactured, tested, and delivered numerous power transformers designed according to the strict standards of PT. PLN (Persero), Indonesia's state-owned electric company.