

# CHANGZHOU SIEYUAN TOSHIBA

2024.01

CHANGZHOU SIEYUAN TOSHIBA TRANSFORMER CO., LTD.

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**常州思源东芝变压器有限公司**  
CHANGZHOU SIEYUAN TOSHIBA TRANSFORMER CO., LTD.





## MISSION

*Smarter power, Better life*



## VISION

*To become a global leader in the electrical industry*

# Sieyuan

### TOSHIBA PHILOSOPHY

*Committed to People,  
Committed to the Future.*

## Brief Introduction



Changzhou Sieyuan Toshiba Transformer Co., LTD., founded in 2008 and located in Changzhou City, Jiangsu Province, now is a joint venture between Sieyuan Electric and Toshiba Group, with a registered capital of 14 million US dollars. The company has introduced Toshiba's advanced transformer technology, and its products cover oil immersed power transformers and reactors, natural/synthetic ester power transformers, gas insulated power transformers, with an annual capacity of 50,000MVA.

The company has passed ISO quality, environment, occupational health and safety management system certification and successfully obtained the national "High-tech Enterprise" certificate in 2021, and the products have been qualified by international authoritative inspection and testing institutions.

The transformers produced by the company are widely used in power grid, wind power, photovoltaic power, hydro power, rail transit, data center, metallurgical construction and other industries, and have been successfully operated in major national construction projects such as the West-East National Gas Transmission Project, Hong Kong-Zhuhai-Macao Bridge Project. In recent years, the company has accelerated the pace of globalization, and its products have been exported to more than 50 countries, Spain, Italy, United Kingdom, Romania and other European countries, USA, Canada, Mexico and other North American countries, Colombia, Chile, Ecuador and other South American countries, Saudi Arabia, Australia, Vietnam, Philippines, Malaysia, Uzbekistan, Kazakhstan and other Asian & Australian countries, South Africa, Egypt, Morocco, Côte d'Ivoire, Ethiopia, Zambia, Botswana and other African countries, on all five continents of the world.

The company will rely on Toshiba technology, fully use the advantages of market, technology, equipment, human resources, management and other aspects as always, and is committed to provide high-quality, safe and reliable, Eco-friendly transformers for domestic and foreign clients and users.



# Company History

## > TOSHIBA

**2008**

Toshiba invested and established  
**Changzhou Toshiba Shudian Transformer Co., Ltd.**

## > Sieyuan

**2004**

Sieyuan was listed on the  
Shenzhen Stock Exchange in 2004  
**Stock Code 002028**

**1993**

**Shanghai Sieyuan Electric Co., Ltd.**  
was founded in Shanghai Jiao Tong University

**2017**

Sieyuan Invested and constructed  
Changzhou Industrial Park,  
and entered the area of transformer.

**2018**

CTS was recombination to be joint  
venture between Sieyuan and Toshiba,  
and was renamed to be  
**Sieyuan Toshiba Transformer Co., Ltd.**  
(Hereinafter referred to as "CST")

**2022**

Production capacity expansion-  
The new factory was put into production

**2024**



Sieyuan Electric Co., Ltd. is a manufacturer of electrical equipment, established in the year of 1993, specialized in R&D of electric power technology, equipment manufacturing and engineering services. Since it listed on the Shenzhen Stock Exchange in 2004 (stock code 002028), the company is developing steadily by 30% compound growth rate every year and added new contract orders of 1.75 billion USD in 2021. Sieyuan has been honored these titles of National Key Torch Plan High-tech Enterprise, China Energy Equipment Top Ten Private Company, Innovative Company in Shanghai etc.

Sieyuan continues to expand the industrial chain. At present, the group has more than a dozen manufacturing entities, located in Shanghai, Rugao, Changzhou, Nanjing, etc. The product is covered in the field of ultra-high voltage, high voltage switchgear, transformer, relay protection and automation system, reactive power compensation device, measuring and monitoring device, power electronics equipment and vehicle electronics. Sieyuan Electric is a smart manufacturing company attaching great importance to independent innovation, R&D and having a modern scientific management concept and continuing to build automated production lines.



# Toshiba Technology

The company fully introduced Toshiba transformer technology. During the design stage, the company utilize Toshiba design TD, verification and calculation software, DR Process system. In the manufacturing stage, Toshiba WSS manufacturing process management system, operation specifications, inspection specifications are followed. The whole process is controlled in strict accordance with Toshiba quality management standards.

## 01 Transformer Design Specification

## 02 Desgin Process Management System

## 03 Desging Tools

## 04 Manufacturing Process Management System

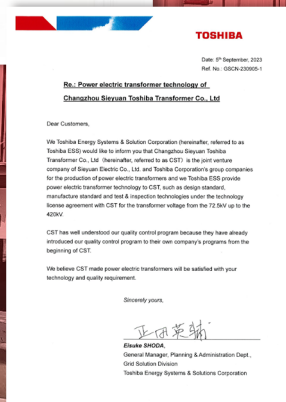
## 05 Working and Inspeicong Specification Manufacturing Manual

## 06 Technical and Quality Supervision



有关电力变压器技术转让合同

东芝能源系统株式会社  
常州思源东芝变压器有限公司



# R&D



INTEGRATED

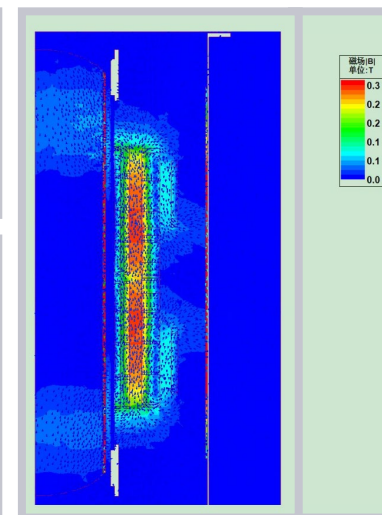
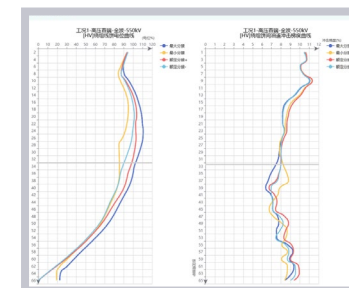
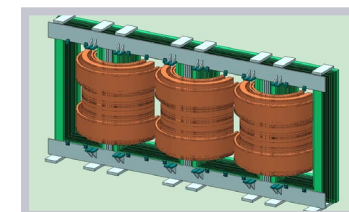


INTELLIGENT



ACCURATE

The company attach great importance to R&D investment and independent innovation, and rely on Sieyuan's advanced computer simulation platform to help transformer design and development be more integrated, intelligent, accurate.





# Equipment

**Sieyuan**

CHANGZHOU SIEYUAN TOSHIBA TRANSFORMER CO., LTD. 07/



**WINDING**



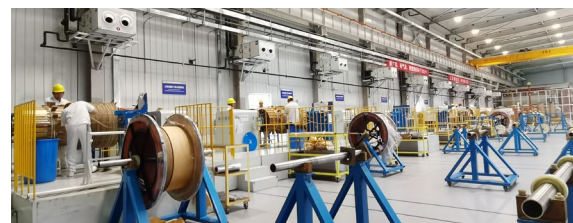
**CORE**



**ASSEMBLY**



**LABORATORY**



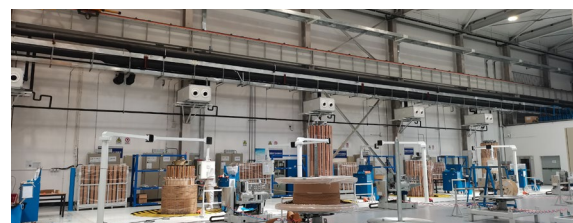
Horizontal Winding Machine



Automatic Cutting Line



Vapor Phase Drying Plant



Vertical Winding Machine



200 Tons Core Stacking And Turning Table



Crane



3000kV Impulse  
Voltage Generator



500kV Power-frequency  
Withstand Voltage Test Equipment



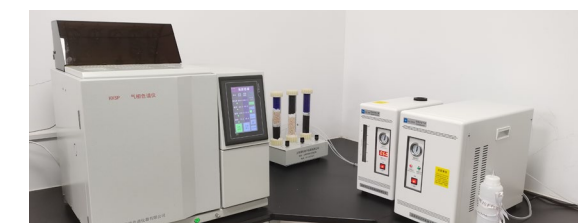
200 Ton Winding Pressing Equipment



Automatic Core Stacking Robot



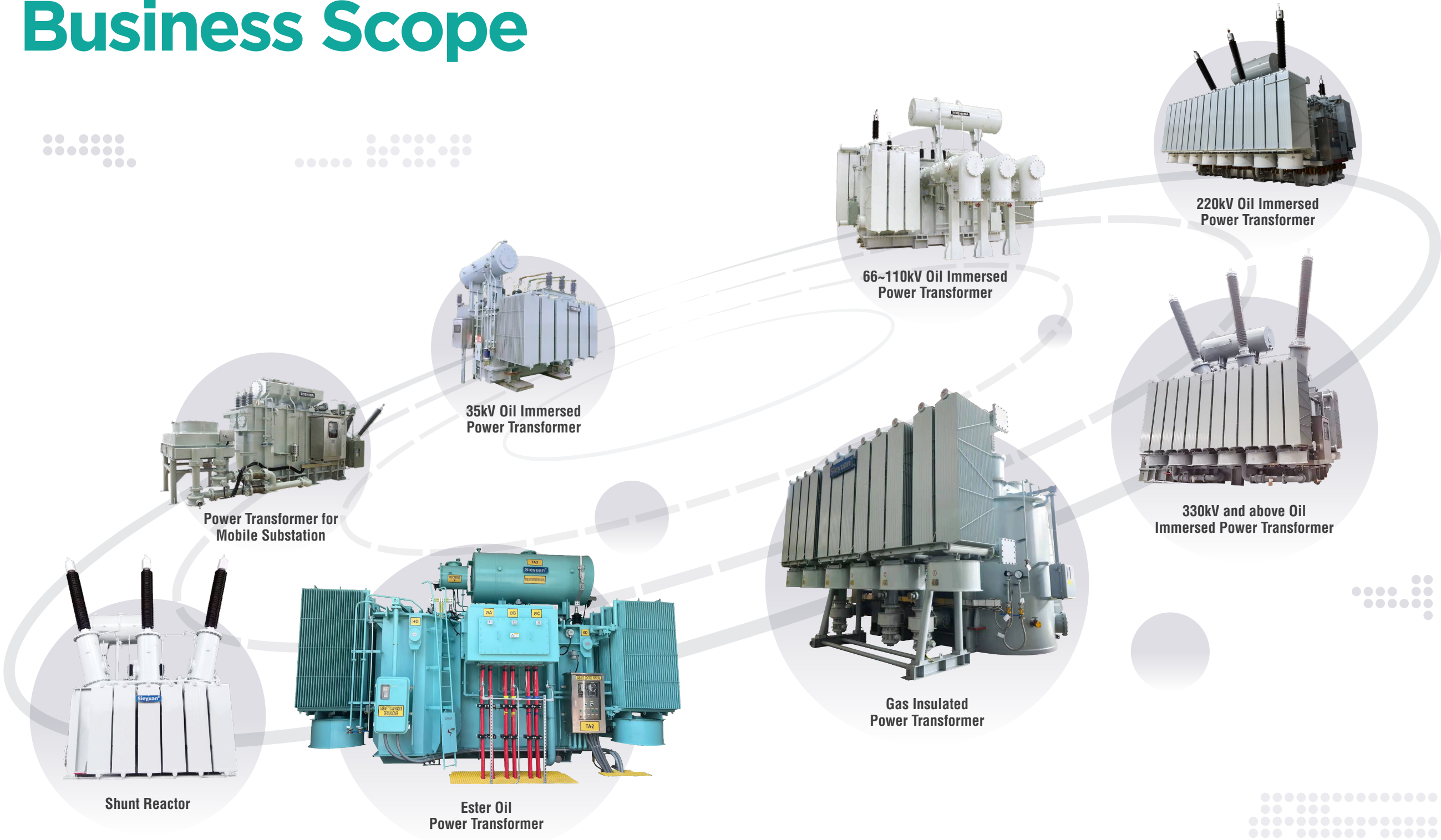
300 Ton Hovership



Oil laboratory



# Business Scope





# Overseas Reference

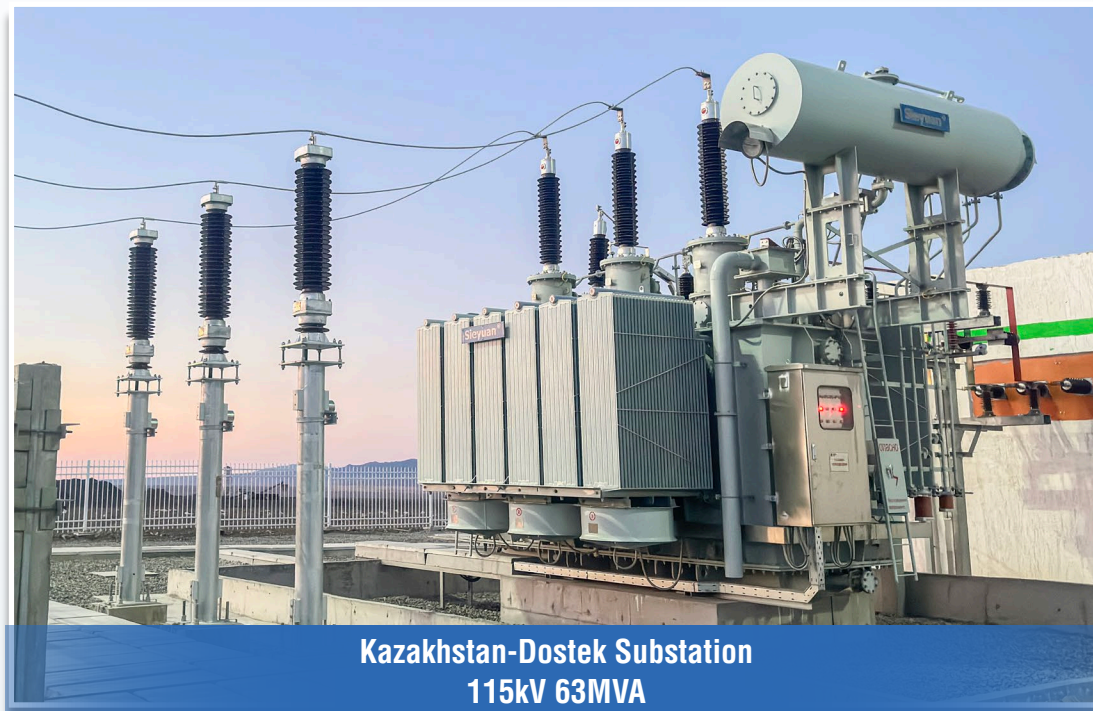
## Africa



## America



# Asia



**Kazakhstan-Dostek Substation**  
115kV 63MVA



**Philippines-Aboitiz Laoag Solar Power Substation**  
230kV 45MVA



**Uzbekistan-Syrdarinskiy Substation**  
220kV 120MVA



**Vietnam-Loc Ninh Solar Power Substation**  
220kV 250MVA



**Armenia-AraratZovuni Substation**  
220kV 125MVA

# Europe & Australia



**Australia Veen Energy Stubbo Solar Substation**  
330kV 250MVA



**UK-Ilos New Energy Meadows Substation**  
132kV 40MVA



**Italy-SE Porto Torres Substation**  
150kV 25MVA



**Spain-SOLARIA Substation**  
220kV 190MVA



# Typical Product



## Synthetic ester transformer, 230kV 60MVA

In November 2022, the synthetic ester transformer developed by Sieyuan Toshiba was successfully put into operation in Mexico. The transformer adopts MIDEI synthetic ester oil, which has the characteristics of flame resistance, environmental friendly, strong overload capacity and long operating life.



## Gas insulated power transformer, 110kV 50MVA

Supported by Toshiba's gas insulated transformer technology, using Sieyuan Electric's product development process and the simulation platform, the company successfully developed 110kV gas insulated transformers and supplied them to Hangzhou International Financial Exhibition Center project. The product successfully passed type test.



## Single-phase shunt reactor, 110kV 80Mvar

In order to actively respond to the scientific research needs of the UHV Department of the State Grid, for the special conditions of the Chuanyu project, Sieyuan Toshiba developed 110kV 80MVA single-phase shunt reactor, and successfully obtained ASTA certification in March 2023



## Natural ester power transformer, 220kV 63MVA

*SVG transformer for feedback of higher harmonic voltage and high order harmonic current in power grid*

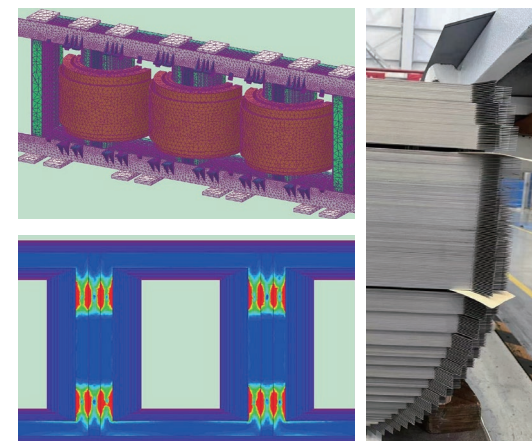
In June 2023, the 220kV harmonic control transformer developed by Sieyuan Toshiba was successfully put into operation in the onshore centralized control center of Huaneng Jiaxing No. 2 offshore wind Farm. The product design not only ensures the normal operation under the condition of high harmonic voltage and current, but also adopts natural ester insulating oil, with advantages of environmental friendly and safety. The product has successfully obtained ASTA certification.

# Product Features

## ※ Low loss and Low noise

01

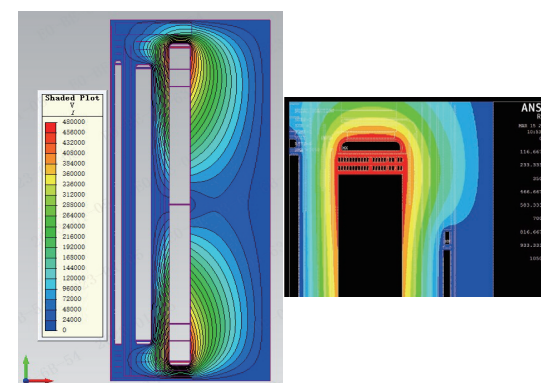
- The core is made of high-quality cold-rolled grain-oriented silicon steel sheet with high performance, high magnetic permeability, with 45 degree inclined joints, multi-step step stacking, no top yoke pre-stacking, to reduce the magnetic resistance, improve the magnetic circuit distribution, and increase the magnetic flux inside the core, so as to achieve low loss and low noise.
- Through accurate calculation of magnetic flux leakage, the coil ampere-turns distribution is adjusted, and the proper composite conductor or CTC is selected to reduce the resistance loss and eddy current loss of the wire.
- Effective special structural design such as using magnetic shield, magnetic slot and low magnetic steel to reduce the loss caused by magnetic leakage and prevent partly overheating.



02

## ※ Low Partial Discharge

- Through the management of class A dust prevention at the manufacturing site, dried in the vapor phase drying plant, vacuum oiling, the round angle treatment for structural parts, the lead joint shaped and shielded, and the use of high-quality insulation materials, etc., to ensure the excellent electrical performance and low partial discharge.
- With advanced electric field analysis technology, the electric field distribution of each part of the transformer is simulated and analyzed, so as to take effective insulation strengthening measures in the design and improve the electrical strength of the product and reduce the volume of partial discharge.



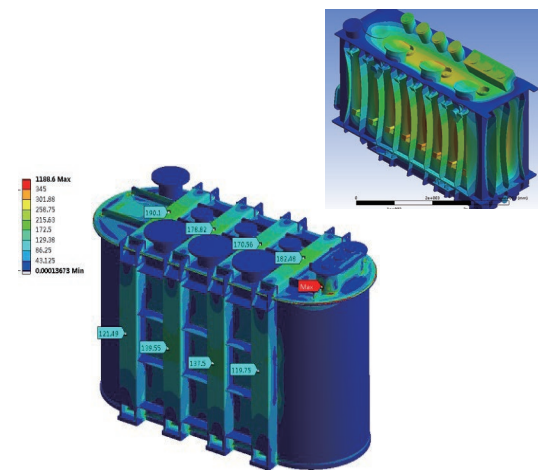
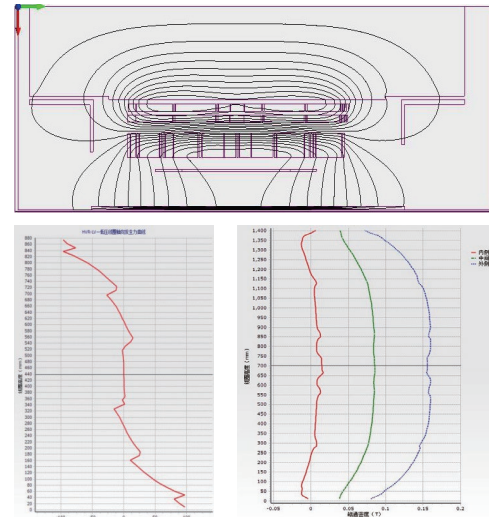


# Product Features

## ※ Strong Short-circuit Withstand Capacity

03

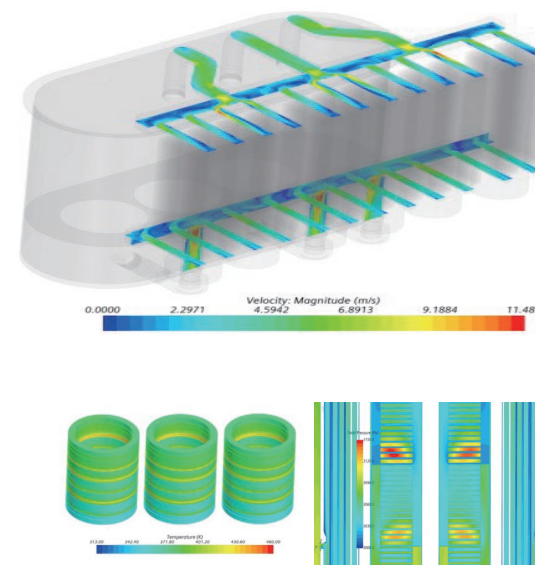
- Use calculate and analyze the sudden short-circuit mechanical force, optimize the ampere-turns arrangement, and rationally select the wire type and yield strength, etc., to ensure that the short-circuit stress meets the requirements of standards.
- When the secondary circuit of the transformer is short circuited or there is an exciting inrush current, a certain coil mechanical force will be generated. Through accurate mechanical force calculation, the wires and internal supporting parts that can withstand this mechanical force are selected.



## ※ Technology to Prevent Leakage of Oil

04

- Utilize the advanced strength analysis software to analysis the tank and parts, so as to ensure the reliable mechanical strength of the tank and prevent oil leakage.
- Through strict incoming inspection of purchased products, the use of reliable oil seal structure, strengthening the oil tightness test and overall inspection before delivery, to eliminate the potential of oil leakage.



## ※ Energy saving and environmental friendly

07

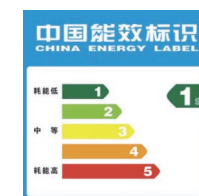
- Toshiba Group positions environmental management as creating the rich value of all products while reducing the environmental load during the entire life cycle of products, achieving co-existence with the earth and contributing to the sustainable development of the earth.
- The products follow the principle of low loss and low noise, do not choose harmful materials, implement green procurement policy, and take environmental factors into account in the production process and procedure to minimize the impact on the environment.

## ※ Effective Cooling Technology

- Temperature rise calculation software are used to calculate and analyze the internal temperature rise of the coil. The coil adopts oil flow guiding structure, which effectively reduces the temperature rise of the hot spot inside the coil, delays the aging of the insulation and prolongs the service life of the product.

## ※ Free tank cover lifting on site and maintenance-free for transformer body

- The company's products are designed, manufactured and quality controlled in strict accordance with Toshiba technology, with a service life of no less than 30 years, on-site installation of no need to lifting tank cover, and maintenance free transformer body for 20 years.





# Certification

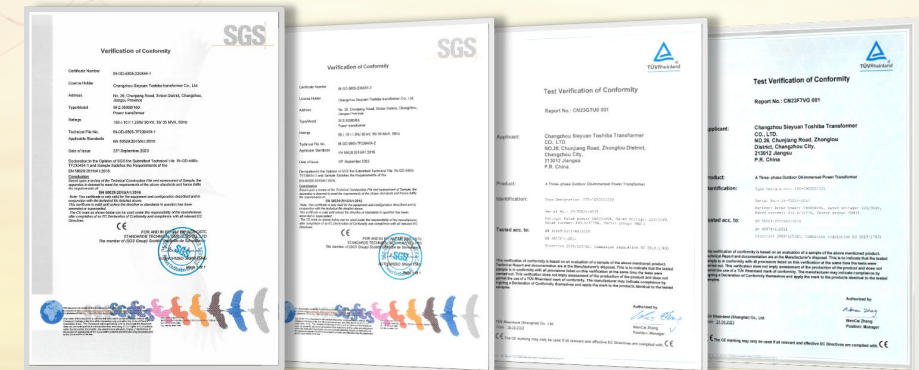
## Type Test Report



## Patent



## CE Certificate



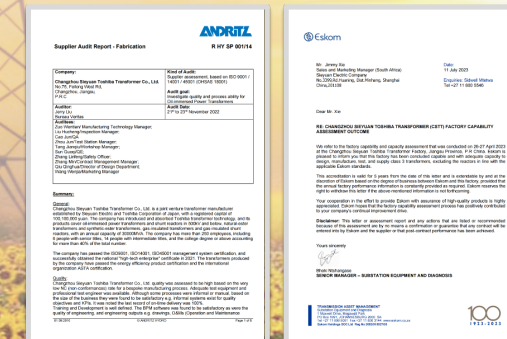
## Energy Conservation Certificate



## ISO Certificate



## Key Customer Qualification





# Overseas Footprint

