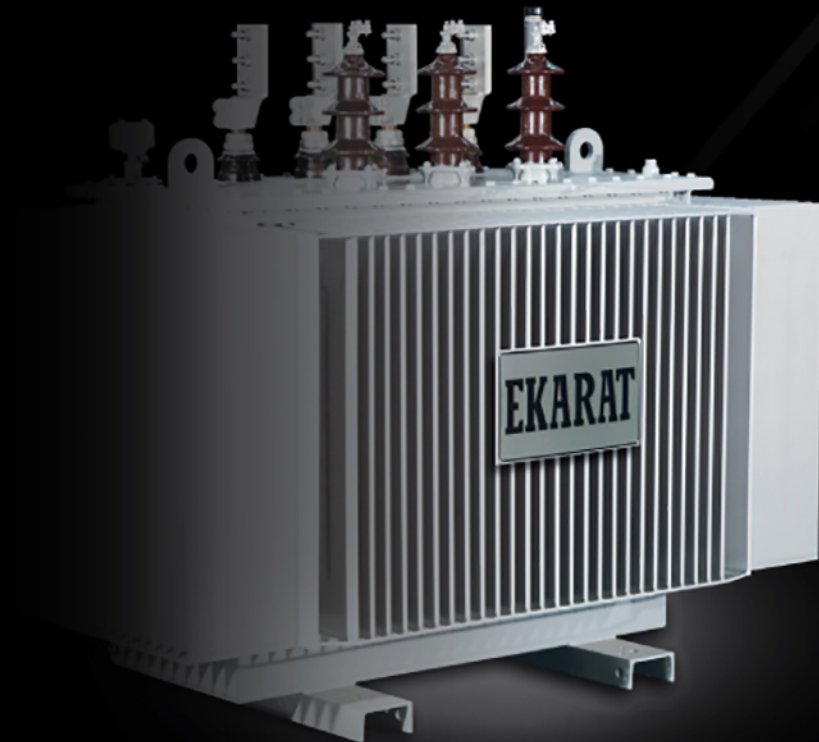


# EKARAT

Extraordinary As Standard



# USER CONFIDENCE IS ASSURED BY OUR PERFORMANCE

**EKARAT** designs and manufactures distribution transformers in the ranges :

- Single - phase : 1 - 1000 kVA
- Three - phase : 1 - 30000 kVA
- Maximum voltage : 36 kV

- ▲ The company has been in business since 1981
- ▲ Registered capital USD 20.39 million.
- ▲ The largest transformer manufacturer in Thailand and in ASEAN region, in terms of manufacturing and distributing.
- ▲ Annual production capacity is approximately 8,000 units or 4000 MVA.
- ▲ Exports have grown steadily since 1989 to more than 30 countries around the world.
- ▲ The production plant uses the most modern CNC machinery.
- ▲ Design and engineering integrity have given **EKARAT** a first class reputation for reliability.
- ▲ International standards are fully recognized in both the design and testing process.

Typically the following standards are followed :

- IEC 60076
- ANSI C57
- VDE 0532 and DIN 4290
- JIS
- TIS 384-2543 (2000)

Other standards can be complied by customer requirements

- ▲ Close contact with consultants, buyers and other specifiers ensures that **EKARAT** keeps up with market requirements
- ▲ The company has been listed **Stock Exchange of Thailand (SET)** in group of **Energy Business and Public Utility** by shortness name "AKR"







# INTERNATIONAL STANDARD APPROVALS AND CERTIFICATES

EKARAT transformers are on the approved list of Electricity Authorities in many parts of the World. Although our own standards are high and quality assured, we recognize the need for and value of International Standard Approvals. Both ISO 9001 Standard Quality Management Systems, ISO 14001 Environmental Management Systems, occupational health and safety management systems OHSAS 18001 by the SGS and Energy management systems ISO 50001. EKARAT transformers have been subjected to and passed the Short-Circuit Performance Test by the renowned KEMA High-Power Laboratory in the Netherlands and Certificate on Electric Testing in Short-Circuit Performance Test from CESITEST Testing Service, in Italy.



## Our Project References

- **Myanmar** : Ahlone Power Plant, Yangon Electric Supply Board  
Fuji Furukawa, Thilawa special economic Zone  
Ministry of Electricity and Energy
- **Singapore** : Resort world sentosa, MRT Thomson line
- **Cambodia** : Electricity du Cambodia
- **Malaysia** : Sabah Electric SdnBhd (Sabah)  
KL-Kepong Oleomas Sdn Bhd  
Samsung SDI Energy Malaysia Sdn Bhd  
Sarawak Energy Berhad  
Tenaga Nasional Berhad (West Malaysia), Panasonic
- **Lao** : Electricity du Laos, Hongsa Power Company Limited  
Nam Theun 2 Power Plant General Information
- **Philippines** : Toyota Motor Philippines Corporation  
CPF : The National Power Corporation
- **Brunai Darussalam** : Department of Electrical Services
- **Nepal** : Nepal Electricity Authority
- **United Arab Emirates** : Dubai Electricity and Water Authority
- **East Timor** : Electricidade de Timor Leste
- **Bhutan** : Bhutan Electricity Authority



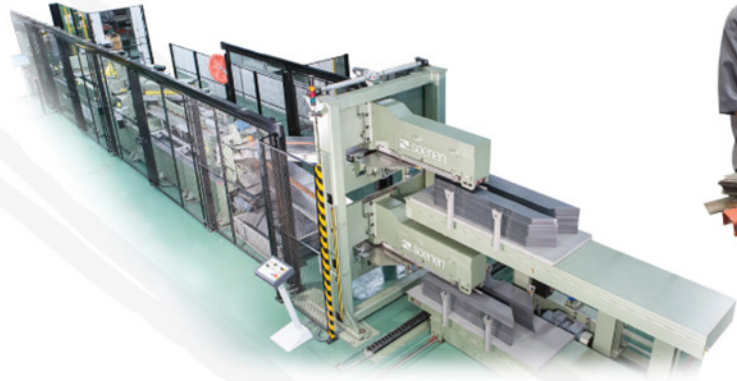


## The Core Key to Improve No-Load Losses

To Make the best use of the step lap configuration **EKARAT** uses CNC machinery to cut the highest grade grain orientated silicon steel. Assembly is done by skilled operators who are trained to ensure their capability to meet our exact standards.

The benefits of the “Step Lap” core are well known.

- Reduced no-load losses
- Reduced exciting current
- Reduced noise levels



## The Coil

The design of the coil has to cover both electrical and mechanical considerations. Careful design helps to minimise temperature rise characteristics.

**L.V. windings** are from copper foil or rectangular paper covered copper conductor, depending on the transformer size.

**H.V. windings** are from either round or rectangular copper conductors, enamel or paper insulated.

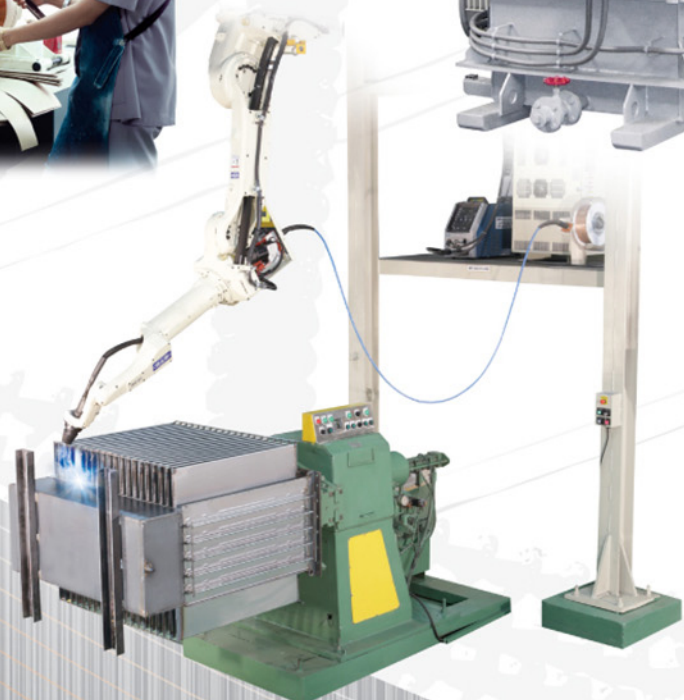
The winding of the coils is done on modern machinery, specifically designed for the job.

The operators are trained in-house to ensure that the design requirements are carefully followed.



## The Tank

Corrugated fin walls are produced on advanced CNC machinery and the tank assembly is by MIG welding. The tank provides structural strength to the completed product and the design has the main influence on heat dissipation. Internal surfaces are varnished and external surfaces are prepared for painting by shot blasting. The standard paint finish is a two coat process of rust inhibiting primer followed by a high specification finish coating (Tanks supplied to O.E.M.s are normally finished in primer only)





# DUCTION PROCESS

## Testing

After vacuum oven drying, the internal connections are re-tightened and then the active components are placed in the tank for final assembly. The transformer is filled with oil that has been degassed and filtered. It is now ready for testing.

**The testing section carries out the series of tests below on all transformers :**

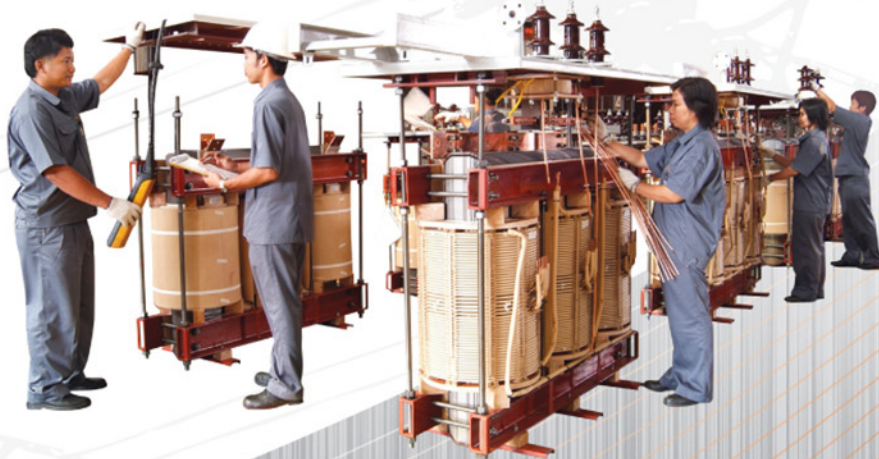
- Ratio Test
- Resistance Measurement
- Polarity and Phase Relation Test
- No-Load Loss Test
- Excitation Current Test
- Impedance and Load Loss Test
- Applied Potential Test
- Induced Potential Test
- Oil Test
- Insulation Resistance Test

## Type Test (If requested)

- Temperature Rise Test
- Impulse Test
- Additional testing / Witness testing is provided if required by customer.

## Assembly

The assembly of the active component is a process requiring a high level of experience. While the previous operations rely to a large extent on the use of purpose built machinery, the assembly process needs skilled personnel to make sure that the finished assembly is mechanically and electrically sound. Core assembly needs careful operating personnel and good quality fixtures to ensure accuracy.





Single-Phase Transformer



Dry Type Cast Resin Transformer



Nitrogen Transformer



## PRODUCT COMPONENTS



Hermetically-Sealed



Conservator Transformer with Rubber Air Cell



Conservator Transformer Side mounted bushing

## Different Countries Requirements

At **Ekarat** we understand that different countries have different requirements. Apart from voltages, the terminations and connections vary and the features specified by one purchaser will differ from those specified by another. Flexibility has always been important in the export business and only by recognizing this has **EKARAT** been able to supply their high quality transformers to many countries.

Conservator Transformer  
with On-Load Tap Changer  
and Cable Box



Conservator Transformer  
( Provincial Electricity Authority  
of Thailand's Specification )



Hermetically-Sealed Transformer



Transformer

Conservator Transformer with Rubber Air Cell  
and Force Air Fans Further Provision



Conservator Transformer with  
On-Load Tap Changer,  
Cable Box and Force Air Fans



## Transformer components

**Ekarat** supplies transformer components and sheet metal work to other transformer manufacturers. Sheet metal items are also supplied to a wide variety of manufacturers in other industries. In the recent past we have supplied.

- Complete tanks
- Conservator tanks
- Corrugated fin material
- Radiator fins
- Cut cores
- Foil winding coils
- Layer winding coils
- Miscellaneous light sheet metal work



[www.ekarat.co.th](http://www.ekarat.co.th)



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30/6/2019