

Distribution Transformer (Aluminum Winding Type)

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1. Assess Product Requirements

1.1 Potential Market

AGT sourcing potential market in Myanmar to promote Aluminum windings type transformer after successfully supply copper winding to wide range of Local market as leading latest technology of transformer manufacturing plants in Myanmar. This means that given the significant economic advantages of aluminum, this electrical conductor can be considered one of the best options to apply in the manufacture of electromagnetic equipment like transformers, especially considering the possibility of producing equipment capable of an equivalent performance under service condition to that provided by transformers with copper windings.

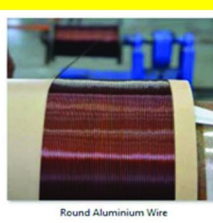
1.2 Design aspects

Comparison of Properties (Al Vs Cu)



Properties	Copper	Aluminium
Electrical Conductivity (%IACS)	100%	61%
Melting Point	1083 °C	660 °C
Specific Gravity	8.9	2.7
Resistivity @20°C Ω mm ² /m	0.01786	0.02857
Maximum practical current density (based on 2sec Short Circuit withstand IEC60076-5)	3.5 A/mm ²	2.0 A/mm ²
Maximum permissible average winding temperature after Short Circuit	250 °C	200 °C

Transformer Capacity:
315KVA, 11/0.4 NLTC-7 Tap



Aluminum Design Data

Particular	Copper	Aluminium
Core Weight	533 kg	464 kg
Conductors	141 kg	114 kg
Insulating Oil	311 litre	331 litre
Total Weight	1193 kg	1102 kg
Tank Dimension [mm]	1082 x 410 x 844	1013 x 443 x 934
No Load Loss	726 watt	695 watt
Load Loss	4130 watt	3500 watt

1.3 Technological aspects

Manufacture of aluminum windings does not represent any difficult technological problem. Where aluminum is to be used in an outdoor atmosphere, there has been great concern about joining and terminating aluminum either to itself or to copper. Today, completely reliable aluminum joints and terminations can be made without any problem.

Table A: Aluminium vs. copper.		
Supposition	True	False
Aluminium price is more stable because of its market availability (twice copper worldwide production);	X	
Aluminium transformers are lighter than copper transformers	X	
Just copper winding transformers bear short circuit efforts		X
Aluminium transformers have bigger losses		X
Aluminium winding transformers are not compatible with copper connectors		X
Copper transformers are more compact than aluminum ones	X	

2. The following are advantages of Aluminum Used in Transformer

- 1) The price of copper has fluctuated heavily during the last few years and the price level is expected to continue to be at high levels, due to limited copper reserves.
- 2) Lighter in weight, the second lowest density metal
- 3) Good electrical and thermal conductivity
- 4) High corrosion resistance
- 5) The second most plentiful metal on earth
- 6) Transformers with aluminum windings have the same losses as that of copper windings and are technically feasible and economically advantageous.