

ABOUT US



Since its been founded , Okuyan Metal Co. Ltd. has completed numerous projects successfully and now offering to you its experience, know-how and the understanding of ethical bussiness in manufacturing transformator tanks, wave walls and radiators. Our company makes customer oriented production in its facilities furnished with high quality, cutting edge equipments.

- Our production principles;
- Labor and worker safety
- Total quality management
- Customer satisfaction
- Ethical business
- Re&De operation
- Human resources management

Okuyan Metal Co. Ltd.'s priority is its workers helath and safety during the production process. Both work safety and quality are aimed with the usage of risk analysis, work flow plans and employee trainings. And the result of quality manufacturing is product safety. Also Okuyan implements all the environment friendly applications in its manufacturing facility. And also using the most efficient equipments Okuyan also shows its sensitivity to energy efficiency.

Okuyan Metal Co. Ltd. forges ahead to become the pioneer with its experienced and dynamic team, ethical business, and Re&De support program builded around the 100 % customer satisfaction principle.

In the 1000 m2 production space and with its expert technical team, Okuyan Metal Mühendislik San. and Co. Ltd. offers its services essentially in those areas;

- Manufacturing corrugated wall,
- Manufacturing radiator,
- Manufacturing transformater tank,
- Surface preparing process (Sanding)
- Surface coating process (Flame and Arc Spray Processes)
- Painting processes (Dip Painting, Spray and Pouring Painting)

Our processes relative to production as shown below:



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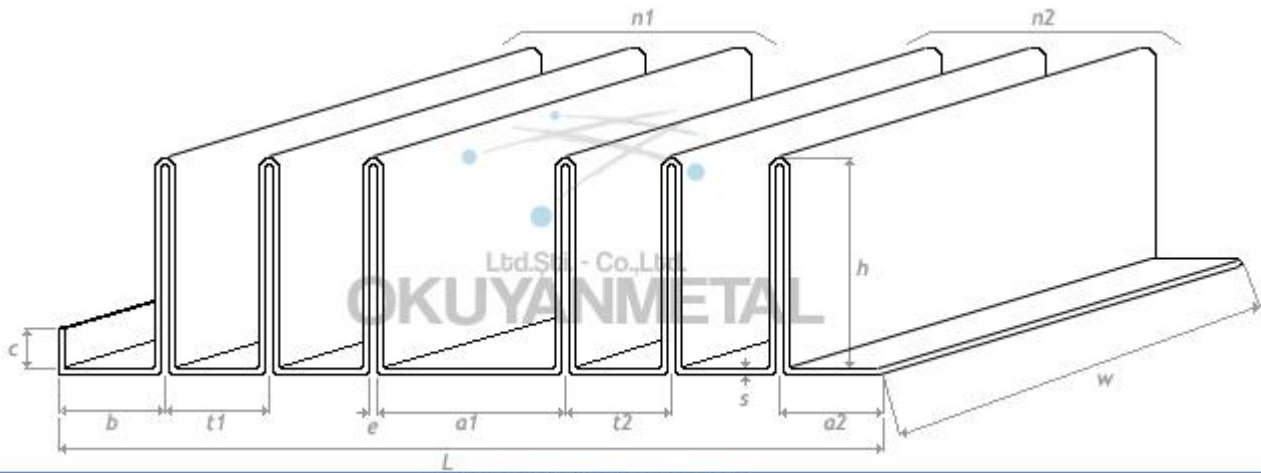
WEB : www.okuyanmetal.com.tr

CORRUGATED WALLS

The main source of heat generation in transformer is its copper loss or I²R loss. Although there are other factors contribute heat in transformer such as hysteresis & eddy current losses but contribution of I²R loss dominate them. If this heat is not dissipated properly, the temperature of the transformer will rise continually which may cause damages in paper insulation and liquid insulation medium of transformer. So it is essential to control the temperature within permissible limit to ensure the long life of transformer by reducing thermal degradation of its insulation system.

The rising temperature at the transformer core, increases the kinetic energy of cooling oil molecules. The cooling oil molecules which has high kinetic energy shuffles across with the molecules which has low kinetic energy and moves to transformer tank wall. Corrugated walls provides heat reduction (cooling) by increasing the contact surface of the heating oil with the atmosphere.

The technical specifications concerning to corrugated walls which produced by full-automatic PLC fin forming machine, are shown below:



CORRUGATED WALL PARAMETERS

The measurements and its explanations shown in corrugated wall paramaters diagram are as below.

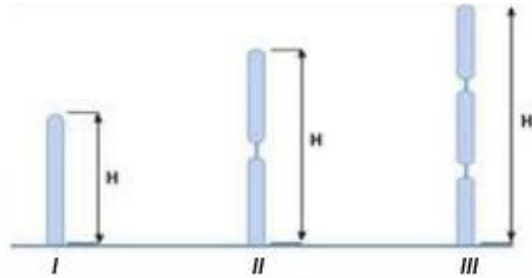
No	Explanation	Code	Parameters
1	Steel width	B	300~1600 mm
2	Steel thickness	S	1.0~1.50 mm
3	Fin height	h	50~400 mm
4	Distance between walls	t	Min. 40 mm
5	Inner gap	e	6 mm
6	Number of sets	n	1~4 set
7	Length	L	Max 2600 mm (Depends on height and width)
8	Folding height	c	15~300 mm
9	Starting bending distance	b	≥40 mm
10	Finishing bending distance	a	≥40 mm

To weld the corrugated walls used in transformer tanks, Full automatic MIG welding machine is used. For this machine, maximum steel thickness is 1.2~1.5mm, width is 300~1600mm, inner gap is 6mm, fin height is 50~400mm and distance between fins is greater than 40mm. To strengthen the corrugated wall, welding machine is able to weld extra steel stick to both sides of the panel.

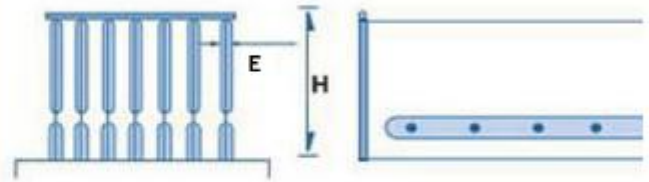


WELDING PROCESS OF CORRUGATED WALLS

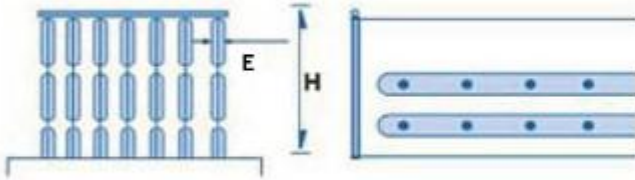
Embossment Layout and Technical Drawings:



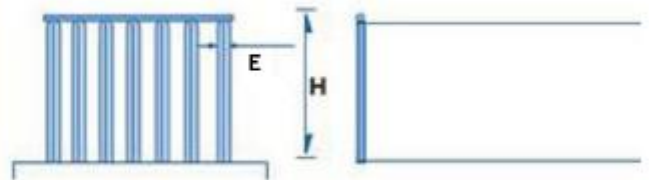
CORRUGATED WALLS WITH and WITHOUT EMBOSSEMENT



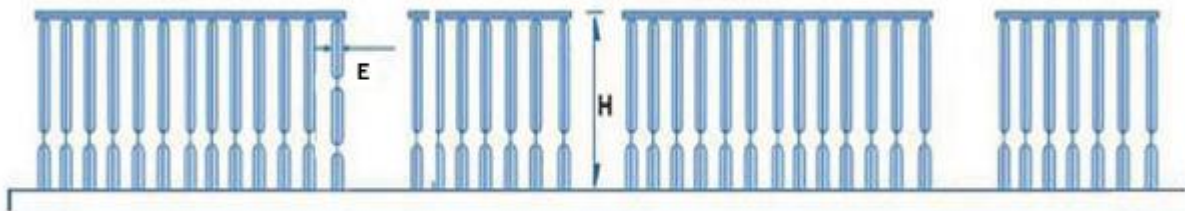
CORRUGATED WALL WITH SINGLE EMBOSSEMENT



CORRUGATED WALL WITH DOUBLE EMBOSSEMENT



CORRUGATED WALL WITHOUT EMBOSSEMENT



EMBOSSMENT LAYOUT IN GROUP CORRUGATED WALL

The layout variations of embossments which are put to strengthen mechanical resistance against pressure, according to fin height.

TRANSFORMER TANKS



The main source of heat generation in transformer is its copper loss or I²R loss. Although there are other factors contribute heat in transformer such as hysteresis & eddy current losses but contribution of I²R loss dominate them. If this heat is not dissipated properly, the temperature of the transformer will rise continually which may cause damages in paper insulation and liquid insulation medium of transformer. So it is essential to control the temperature within permissible limit to ensure the long life of transformer by reducing thermal degradation of its insulation system.



In the oil immersed transformer tanks, core is inside the transformer cooling oil. Transformer tank provides isolation of oil and the core from outside environment and used for cooling process.

Transformer tanks according cooling types:

- ONAN "Oil Natural Air Natural"
- ONAF "Oil Natural Air Forced"
- OFAF "Oil Forced Air Forced"
- OFWF "Oil Forced Water Forced"
- ODAF "Oil Directed Air Forced"
- ODWF "Oil Directed Water Forced"

Transformer tanks according cooler types:

- Tanks without cooler
- Corrugated wall type tanks
- Radiator panel type tanks

Transformer tanks according oil dilataion

- Tanks with reserving tubes
- Hermetic type tanks

Okuyan Metal Co., Ltd. makes production of transformer tanks from 10 kVA to 25 mVA. With its production team, expert in one's field, and technologic manufacturing infrastructure Okuyan transformes completely your projects to production.

Transformer tank production processes:

- | | | |
|--|---------------------------|---------------------------|
| 1-Project assessment | 5-Testing | 9-Intermediate coating(*) |
| 2-Corrugated wall or radiator production | 6-Surface preparation (*) | 10-Finishing Coat (*) |
| 3-Tank and cover production | 7-Zinc (Zn) spraying (*) | 11-Packing |
| 4- Framework and welding processes | 8-Primer coating (*) | 12-Delivery |

(*) Up to customer requirements

SURFACE PREPARATION (SANDING)



Sanding process is one of the steps which aims to protect the steel against oxidation. If steel is exposed to the atmosphere, a chemical reaction occurs between the steel and oxygen. Humidity and rain quicken this oxidation process. This issue is generally called as rusting and it weakens the steel day by day, at some point makes it unusable. In order to prevent oxidation of steel, the item must be coated with a protective material and/or must be painted. Thus, the item can be used safely for years.

Before the painting and coating processes, surface of the steel must be cleansed from all kind of oil, rust and paint residue. In transformer tanks, sanding is the most efficient way to obtain a smooth and clean steel surface. During sanding process, sand is shot to the surface of the steel with the help of high pressure air. Thus the surface is cleaned colloding the layer of the part, as much as desired. Grit size can be changed according to purpose. Since thin metal plates are used for transformer tanks, silica sand which has extra fine types, is used in mild volume sanding.

Transformer tanks are going under approximately SA2.5 sanding process with the sanding cabinets, within Okuyan Metal Co. Ltd. Also drying, airing and filtration processes which are necessary for sanding vessels are done in our company.

ZINC (ZN) SPRAYING (METALLISATION)

Thermal spray process is applied to the sanded surface spraying the melted coating material which was in the wire or powder form. Thermal spray process aims the protection of metal surface against corrosion (rusting).



Surface which is prepared by sanding should be coated as soon as possible. Oxygen and propane are used as the heat source for the melting process. Coating material which is prepared for the process by atomized is sprayed to surface via pressured air.

Thanks to its thermal coating (flame spray) process, Okuyan Metal Mühendislik San. and Co. Ltd. has become a changemaker company in the transformator tank manufacturing industry in Turkey. A 100µ thick (600 g/m²) transformator tank's resistance life is 7 or 8 years longer than a transformater tank's which has been just painted with sanding.



Okuyan Metal Co. Ltd. can produce 1000 m² coating in a month, 100µ (600 g/m²) thick, using zinc coating method in its transformator tank manufacturing facilities.

PAINTING



As is known, power and distribution transformers are the crucial and expensive components of the transformer box. These components, with good maintenance, especially of the cooling system components, can run efficiently during the desired intervals. We select the best painting method and materials in accordance with the customer desires and the suggestions of our painting facility, and we produce 100 % coated, corrosion resistant surfaces.

Pouring painting is the most common method used in transformer tanks and allows components like corrugated walls, thermometer pockets, bushing attachment point, collars to be covered completely. Besides the inner walls of the tank can be painted, as a result the surface protection application is provided in the best way.

Okuyan Metal Co. Ltd. presents you sanding, zinc coating and painting processes all together. Tanks have been painted after being gone through sanding process, have a longer life than those which have been painted with traditional methods.

A transformer tank which is painted approximately 100µ thick, gains almost the perfect corrosion resistance system.

MACHINE LIST

TRANSFORMER TANK MANUFACTURING:

Corrugated Fin Wall Machine (Fin Folding Machine)	:1 Pcs
Robotic Welding Machine	:1 Pcs
MIG/MAG Welding Machine	:6 Pcs
Welding Leakage Test Machine	:1 Pcs
Eccentric Press	:1 Pcs
Cranes	:9 Pcs
Plasma Cutting Machine	:1 Pcs

BLASTING AND PAINTING:

Tank painting machine and equipments	:1 Set
Tank Blasting machine and equipments	:1 Set
Painting Test Device (Elcometer)	:1 Pcs
Arc Spray Machine	:1 Pcs

PRODUCTION CAPACITY

:800Tank/Month

REFERENCE LIST

Company Name	City	Country
DTS Transformatör	Diyarbakır	TURKEY
ATS Transformatör	Adıyaman	TURKEY
Köksan Trafo	Şanlıurfa	TURKEY
Özgökçe Trafo	Şanlıurfa	TURKEY
Trans-el Trafo	Şanlıurfa	TURKEY
Beta Trafo	Adana	TURKEY
Özgüney Transformatör	Ankara	TURKEY
Azp Trafo	Ankara	TURKEY
Ankara Trafo	Ankara	TURKEY
Kaplan Trafo	Ankara	TURKEY
Eren Transformatör	Ankara	TURKEY
STD Trafo	Adana	TURKEY
Kayseri Trafo	Kayseri	TURKEY
Federal Transformer LLC	Abu Dhabi	UAE
Western Transformers	Jeddah	SAUDI ARABIA
ELFIORE ELEKTRIKE sh.p.k	Tiranë	ALBANIA