



Thermocool Engineering Pvt Ltd

(ISO 9001:2008)

Office & Works : Ramchandrapur Industrial Area.

P.O. Narendrapur.

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KEY PERSONNEL

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THERMOCOOL ENGINEERING PVT. LTD.

WORKS : RAMCHANDRAPUR. P.O.NARENDRAPUR.
KOLKATA:700103. INDIA.

SPECIFICATION : PRESSED STEEL RADIATORS

Revision No. 00

Date 15.06.2011

1. **SCOPE:** This document covers specifications of Thermocool Engineering Pvt Ltd (TEPL) manufactured PRESSED STEEL RADIATORS, used normally in oil cooled transformers.
2. **APPLIED STANDARDS:** The manufacture of the radiators follow the following standards and guidelines:
 - a. **BS EN 50216, Part-6:2002:** Power Transformer and Reactor Fittings, Part 6: Cooling Equipment- Removable radiators for oil immersed transformers
 - b. **IEEMA 9-1990 & AMENDMENT 1/94:** Standard for Pressed Steel Radiators for Transformers.
 - c. **ISO 12944:** TEPL prefers that Client specify detailed coating scheme, including preferred paint supplier. In the absence of Client specification, coating of products will be guided by ISO 12944 (Paints and Varnishes – Corrosion prevention of steel structures by protective paint systems).
3. **DRAWING:** TEPL prefers that Client provide detailed drawing. However, in the absence of drawing from Client, manufacture will be as per general scheme of radiator shown in BS EN 50216, Part 6:2002, Figure 2 : FG-type radiators with flange and elements having the same lengths.
4. **MATERIALS:** Materials used for manufacture will be as follows unless otherwise specified by Client:
 - a. **Cooling elements:** CRCA Sheet (ASTM A1008-08a/ IS 513, Grade:D), nominal thickness 1.2 mm.
 - b. **Header Pipes :** Steel Pipes (ASTM A513-08 or IS 3074, ERW-1 / ERW-2)
 - c. **Attachments:** Steel (IS 2062 / ASTM A 36/A 36M-08)
 - d. **Oil sealing Gaskets:** PTFE (Teflon)
5. **PRODUCT SPECS:** Dimensions, surface area, oil content and weights of standard products are annexed, for standard width of 520 mm. Alternative width of 380 mm is possible on request.
6. **TESTING:** Factory Testing is done as required by BS EN 50216, Part-6:2002, Art. 4, viz., visual inspection, flushing check, leakage check with oil & compressed air, paint thickness checks and scratch tests. Products have factory test certificates for above. Clients may witness Factory Tests after prior notification.
7. **IDENTIFICATION:** Manufacturer ID with Serial No is marked on each unit.
8. **PACKING & TRANSPORT:** Unless otherwise specified by client, the radiators are packed in plastic sheets and wooden crates adequate for safe transportation to Client's designated site. Packing Cases are marked with Origin & Destination Tags.



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SAMPLE CHART:

| SIZE 520 | PRESSED STEEL RADIATOR: FA./.././520/.... CHART | | | | | |
|-------------|---|------------------|------------------------|---------------------------|---------------------|----------------|
| Sl | Size (mm) | Product ID | Sheet Thick (mm) | Area (m ²) | Oil Qty (Lit) | Weight (kg) |
| | L x N x W | | | | | |
| 1 | 600*10*520 | FA.600.10.520/. | 1.20 | 6.3336 | 28.75 | 63.48 |
| 2 | 700*10*520 | FA.700.10.520/. | 1.20 | 7.3892 | 32.09 | 73.41 |
| 3 | 800*10*520 | FA.800.10.520/. | 1.20 | 8.4448 | 35.35 | 83.23 |
| 4 | 900*10*520 | FA.900.10.520/. | 1.20 | 9.5004 | 38.65 | 93.17 |
| 5 | 1000*10*520 | FA.1000.10.520/. | 1.20 | 10.5560 | 41.91 | 103.1 |
| 6 | 1100*10*520 | FA.1100.10.520/. | 1.20 | 11.6120 | 45.19 | 112.96 |
| 7 | 1200*10*520 | FA.1200.10.520/. | 1.20 | 12.6670 | 48.56 | 122.85 |
| 8 | 1300*10*520 | FA.1300.10.520/. | 1.20 | 13.7230 | 51.80 | 132.68 |
| 9 | 1400*10*520 | FA.1400.10.520/. | 1.20 | 14.7780 | 54.48 | 142.31 |
| 10 | 1500*10*520 | FA.1500.10.520/. | 1.20 | 15.8340 | 58.37 | 152.47 |
| 11 | 1600*10*520 | FA.1600.10.520/. | 1.20 | 16.8900 | 62.26 | 162.64 |
| 12 | 1700*10*520 | FA.1700.10.520/. | 1.20 | 17.9450 | 66.15 | 172.8 |
| 13 | 1800*10*520 | FA.1800.10.520/. | 1.20 | 19.0010 | 70.04 | 182.97 |
| 14 | 1900*10*520 | FA.1900.10.520/. | 1.20 | 20.0560 | 73.93 | 193.13 |
| 15 | 2000*10*520 | FA.2000.10.520/. | 1.20 | 21.1120 | 77.82 | 203.3 |
| 16 | 2100*10*520 | FA.2100.10.520/. | 1.20 | 22.1680 | 81.72 | 213.46 |
| 17 | 2200*10*520 | FA.2200.10.520/. | 1.20 | 23.2230 | 85.61 | 223.63 |
| 18 | 2300*10*520 | FA.2300.10.520/. | 1.20 | 24.2790 | 89.50 | 233.79 |
| 19 | 2400*10*520 | FA.2400.10.520/. | 1.20 | 25.3340 | 93.39 | 243.96 |
| 20 | 2500*10*520 | FA.2500.10.520/. | 1.20 | 26.3900 | 97.28 | 254.12 |

EXPLANATION OF ID :

Each product is identified by an ID having nomenclatures = **F.A(B).S.L.N.W./Sl.**, where
F= Fin Type Radiator, **A**= With Flanges, (alt. **B**= Without Flanges), **S**= Swan Neck
L= Length, centre to centre, **N**= No of Fins, **W**= Width of Fins, **Sl**= Serial No of Unit.

For example, Product 20 above will have ID = **FA.2500.10.520/**(Serial No of product)

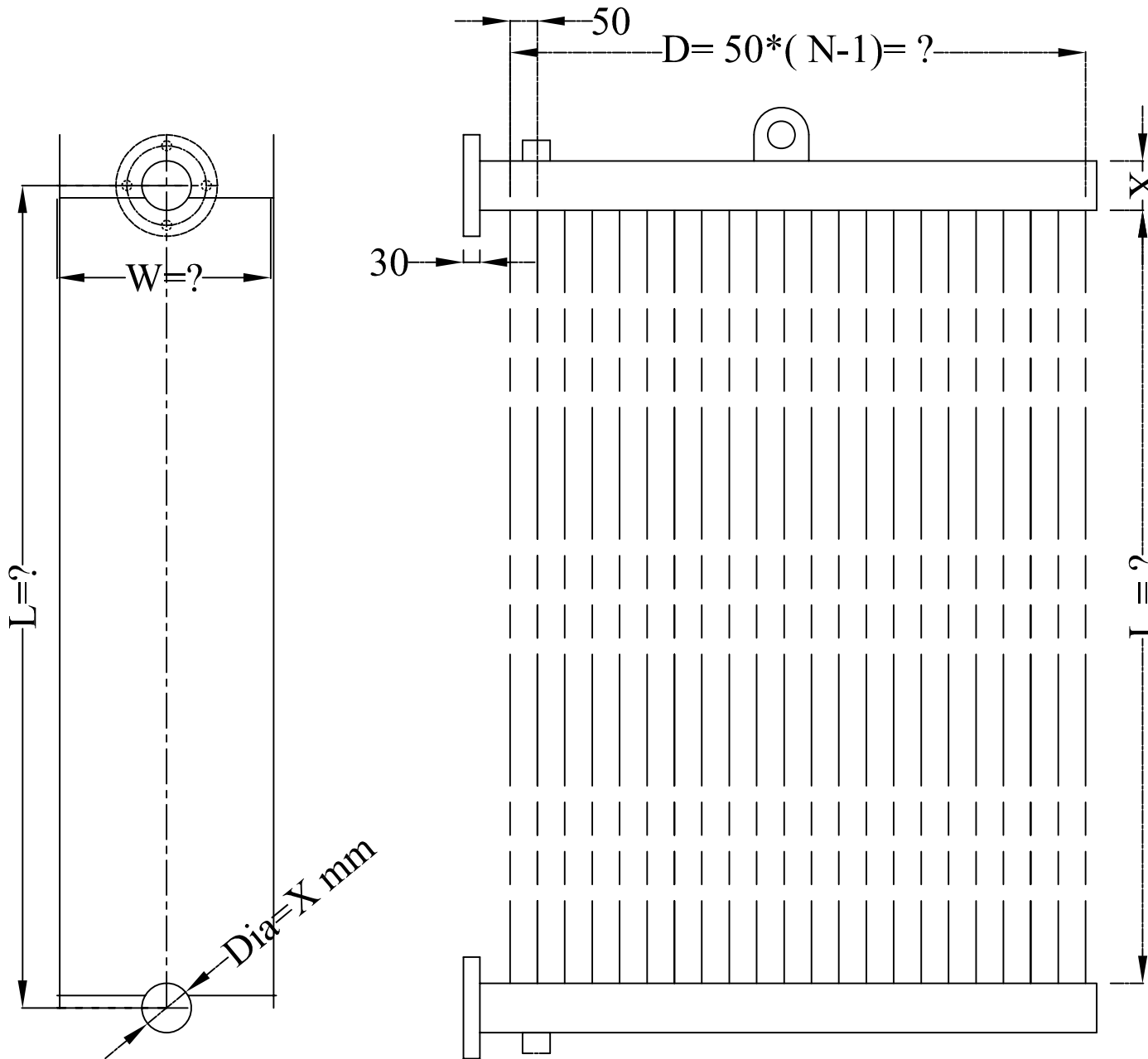
TEPL TESTING FACILITIES (INHOUSE):

1. **COMPRESSED AIR TEST:** The radiators are filled with compressed air @ 200 kPA (~ 2 kg/cm²) and fully immersed in tank filled with water to detect air leaks, however small. If any leak is detected, it is rectified and test repeated. Facilities available for this are testing tank, air compressor and air receiver, flexible connections, jigs etc. ***This is a compulsory check for all products.***

2. **HOT OIL TEST:** The radiators are filled with transformer oil at temperatures 60°C~65°C and are kept at a pressure of 200 kPA (~ 2 kg/cm²) for 3 hrs, to detect any oil leak, however small. If any leak is detected, it is rectified and ***both compressed air test and hot oil tests are repeated.*** Facilities available in-house for this test includes barrel for storing & heating transformer oil connected to necessary pump and piping. ***This test is randomly done for 1 in every 10 product.***

3. **PAINT THICKNESS TEST:** Paint Thickness measurement gauge is maintained. Paint thickness as per Client requirement is teste ***randomly for 1 in every 10 product.***

| SOME OF OUR CUSTOMERS | |
|----------------------------------|---|
| NAME OF CUSTOMER | ADDRESS OF CUSTOMER |
| Truvolt Engg. Co. Ltd | 1/1A, Biplabi Anukul Chandra Street. Kolkata- 700072. |
| RTS Power Corporation Ltd | 56 Netaji Subhas Road. Kolkata : 700001 |
| Power Master Electricals Pvt Ltd | 12, Jessore Road. Kolkata : 700028 |
| Orissa Transformers Limited | Sector A, Zone B, S-3.73 Mancheswar Industrial Estate. Bhubaneswar:751010. |
| Neelachal Transformers Pvt Ltd | Bampada. P.O.- Chanpur. Dt: Balasore. Orissa. |
| Alfa Transformers Ltd | 3337 Mancheswar Industrial Estate. Bhubaneswar : 751010 |
| Prag Electricals Pvt Ltd | Industrial Estate. Bamini Maidan. Guwahati: 781021. |
| Technovel | Makum Road, Tinsukia. Assam |
| Technical Associates Limited | 8 th KM, Faizabad Road. Ismailgunj. Lucknow: 226016 |
| Andrew Yule & Co. Ltd | 14, Mayurbhanj Road. Kolkata: 700023 |
| Biecco Lawrie | 6, Mayurbhanj Road. Kolkata: 700023. |



PLS SPECIFY

L = mm
 W =mm
 N =(No of elements)
 X = mm

MATERIAL LIST

| SL | ID | ITEM | MATERIAL |
|----|----|---------------------|---------------------------------|
| 1 | | Element | CRCA |
| 2 | | Header Pipe | MS |
| 3 | | Flange | MS |
| 4 | | Air Release Socket | MS |
| 5 | | Plug for A R Socket | MS |
| 6 | | Bracing Strap | MS |
| 7 | | Lifting Lug | MS |
| 8 | | Washer | Nylon |
| 9 | | Internal Varnish | IEEMA 9/1990 IS:10026 IS:335 |
| 10 | | Painting | Client Spec |
| | | | |
| | | | |

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 Ranchandnagar Industrial Area, Kofitola-700103, India. Email:info@thermocoolindia.com. Ph: 91 33 24287363. Fax: 91 33 24257132

| | | | | | |
|--------------|----------|-----|-----------|------------------|----------------|
| TITLE | | | | | |
| CLIENT Q | | | | | |
| SCALE | DATE | ENC | APPROVALS | DEPT | DRAWING NUMBER |
| Not to scale | SPACED | | OWNER | Production | TE/...../01 01 |
| Print A4 | CHECKED | | | DATE: 15.06.2011 | SHEET 1 OF 1 |
| | REV. REV | | | | |

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Unless otherwise stated, X is 90 mm; other details as follows:

Fin = CRCA 1.2mm Washer= Nylon Internal Protection:Varnish per IS : 10026 Total Paint Thickness=90-100 micron
 Other fittings = MS Sand Blasting: SAE 2.5/30-40 micr Primer = Zn Chromate per IS:2074 Top Coat: Synthetic Light Grey



Certificate Of Registration

QUALITY MANAGEMENT SYSTEM

This is to Certify that the Quality Management System of:
THERMOCOOL ENGINEERING PVT. LTD.

Address: Ramchandrapur Industrial Area, Ramchandrapur, P.O: Narendrapur,
Kolkata- 700 103, West Bengal, India.

ANZSIC CODE: 2760

Has been assessed and found to meet the requirements of:

ISO 9001:2008

Clause 7 permissible Exclusions: 7.3

The certificate is valid for the following scope :
Manufacture and Supply of Pressed Steel Radiator by Sheet Metal Fabrication.

Certificate Number: IN/QMS/00048

Issue no.: 01

Date of approval : 15.06.2009

Valid until : 14.06.2012

Revision no: 01

Revision date : 10.05.2010



S. Dutta
Managing Director



Surveillance Audit 1st Year

Surveillance Audit 2nd year



ACC.No.M4151008I

MS CERTIFICATION SERVICES PVT. LTD.

Address: 3/23 R.K.Chatterjee Road, Kolkata-700042, India

Web: www.ms certification.org

The Accreditation Body is Joint Accreditation System of Australia and New Zealand
(JAS-ANZ), Canberra, Australia.

The validity of this certificate can be verified at www.jas-anz.org/register
The Certificate is Valid Only if the Annual Surveillance Mark is Signed by Auditor on Original.

F60.rev.03