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TECHNICAL SPECIFICATION

FOR

STAINLESS STEEL FLATS FOR GRIDS FOR 700 MWe PROJECT STEAM GENERATORS

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STAINLESS STEEL FLATS FOR GRIDS FOR
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NPCIL PROPRIETARY

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1.0 SCOPE

This specification establishes the technical requirements for the material, manufacture, inspection, examination, testing and supply of stainless steel flats to material designation No. 1.4550 according to DIN EN 10028-7 with supply condition m (o). All requirements given herein are the minimum requirements. Alternate equivalent material may be considered provided it is demonstrated that the above mentioned minimum requirements are met.

This specification is applicable for Steam Generators of 700MWe projects beyond RAPP-7, 8.

2.0 CONTENTS

The requirements of this Specification are presented under the following headings:

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Quality Surveillance 15.0
Marking 16.0
Test Reports / Certificates 17.0
Packing and Shipment 18.0
Figure – 1 : Grid Flats

3.0 PROCESS OF MANUFACTURE

The flats are made by cold/hot drawing. Subsequently they are to be solution annealed, ground, pickled and passivated. The flats are to be straight without any warping or twisting. Tolerances indicated in the figure-1 of this specification are to be strictly adhered to.

4.0 CHEMICAL COMPOSITION

The chemical composition shall be as per DIN EN 10028-7 material no. 1.4550. Residual copper content shall not be more than 0.3%, as per product analysis.

5.0 HEAT TREATMENT

All the flats shall be solution annealed according to DIN EN 10028-7.

6.0 MECHANICAL PROPERTIES

The mechanical requirements are as per DIN EN 10028-7 material No. 1.4550. Unless otherwise specified, the tests shall be carried out as per ASTM A-370.

7.0 CORROSION TEST

Intergranular corrosion test shall be carried out on samples from each heat treated batch as per ASTM A-262 Case E with preceding sensitizing heat treatment at 650^0C for 30 minutes.

8.0 ROUGHNESS

The flats shall be ground smoothly and the surface finish shall be Ra $\leq$0.8 µm. The surface finish measurement shall be supported with a roughness measurement diagram.

9.0 CLEANLINESS

The external surface of the flats shall be clean and free from every type of contamination or impurity such as grease, oil, remnants of drying materials, decomposition products, cleaning medium etc. The flats shall also be free from ferritic and other external surface impurities.

10.0 STRAIGHTNESS

The individual flats shall be straight without any bow or weaviness. The maximum permissible bow and distortion are indicated in Figure-1.

11.0 GENERAL

Tears and other material breakages as well as macroscopic visible inclusions are not permissible.

12.0 TEST MATERIAL

Each heat treated batch shall be tested at the supplier's works. The supplier shall send one test flat of full length for each heat treated batch with clear identification to the particular lot along with the flats.

13.0 DIMENSIONAL CHECK

Each flat shall be visually examined & checked for dimensional conformity with Figure-1.

14.0 PROCEDURES AND PLANS

The following procedures and plans shall be submitted to the purchaser for review and approval in six copies each prior to start of manufacture.

a) Manufacturing plan indicating the sequence of operations, testing, witness and hold points. Witness point signifies that the manufacturer will intimate date of actual performance of that activity to the purchaser sufficiently in advance so that purchaser can witness the performance of the activity.

However, in case purchaser is not present, the manufacturer can proceed with the job.

Hold point is similar to witness point except that in case of Hold Point the manufacturer can not proceed with the activity unless purchaser is present or has given written waiver to proceed without his presence.

b) Heat treatment plan.
c) Mechanical test procedures.
d) Quality assurance plan.
e) Surface treatment procedure.
f) Intergranular corrosion test procedure.

15.0 QUALITY SURVEILLANCE

All material shall be subjected to quality surveillance by the Purchaser or his authorized agency during manufacture. The material shall not be supplied until the shipping release is given by the Purchaser or his authorized agency.

16.0 MARKING

16.1 The following shall be legibly marked on each flat by a vibro etcher.

a) Heat No. / Melt No.
b) Material specification and grade.
c) Size and weight.
d) Supply conditions.
e) Inspection agency / Purchaser's seal.
f) Manufacturer's name.

16.2 The following shall be legibly marked on each box before shipment.

a) Purchase order number.
b) Material specification
c) Melt No.
d) Heat treated lot number.
e) Number of pieces.
f) Dimensions.

g) Destination.

17.0 TEST REPORTS / CERTIFICATES

Four (4) copies of all test reports / certificates shall be sent to the Purchaser immediately after completion of tests / inspection, prior to shipment of material. One set of test reports / certificates shall be dispatched along with the material for each unit. The reports shall be submitted in bound volume.

The following reports shall be submitted.

a) Chemical analysis.

b) Mechanical test reports.

c) Heat treatment charts.

d) Intergranular corrosion test report.

e) Visual and dimensional inspection report.

f) Roughness measurement report with diagram.

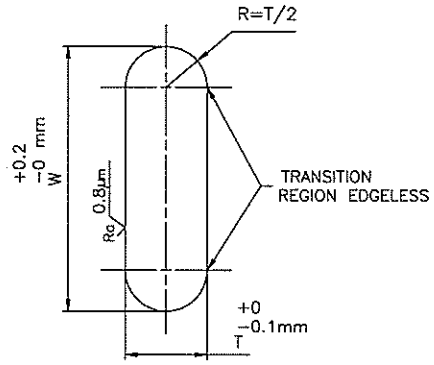
Final documentation containing all the above shall also be submitted in soft form (pdf format) with proper indexing

18.0 PACKING AND SHIPMENT

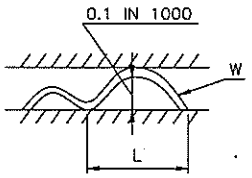
The flats shall be packed in boxes according to uniform length and same heat treated lots. The individual flat shall be completely covered by plastic sheets and shall be separated from each other by suitable intermediate inserts made of paper or wood. The boxes shall contain moisture absorbents to prevent any ingress of moisture. The packing shall be worthy for sea transport. Adequate supports and bracings shall be provided to ensure that the flats do not bend or distort during handling & transportation. Materials for each unit shall be packed separately.

The supplier shall submit a packing specification/procedure to the Purchaser for review and approval prior to packing and shipment.

1.PROFILE AND SURFACE



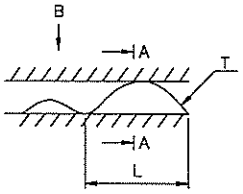
3.STRAIGHTNESS



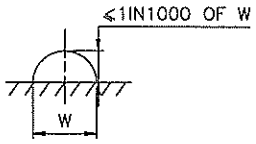
VIEW–B

STRAIGHTNESS RELATED TO
ANY MEASURED LENGTH
= 0.1 IN 1000 OF MEASURED LENG

2.WAVINESS AND TWISTING



4.CONVEXITY



SECTION–AA

WAVINESS RELATED TO ANY MEASURED
LENGTH (L) (>250mm)=0.1 IN 1000(MAX)
OF MEASURED LENGTH.

TWISTING RELATED TO ANY MEASURED
LENGTH (L) (>250mm)=0.3 IN 1000(MAX)
OF MEASURED LENGTH

W=WIDTH OF STRIP

T=NOMINAL THICKNESS OF STRIP.

GRID FLATS

FIGURE–1