



## TECHNICAL INSTRUCTIONS: FOUNDRY.

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### SPECIFICATION FOR M.S. FABRICATED MOULDING BOXES ( WITH BUSHES )

TIF – 717

Rev: 01

#### 1.0 SCOPE:

- 1.1. This specification covers the requirements of moulding boxes fabricated from steel and their main Components.
- 1.2. The ranges of sizes covered are from 600 x 600 x 200 to 1600 x 1000 x 400.
- 1.3. This specification applies only to the boxes with pin holes on the longitudinal side and fitted with Round bushes on one end and elongated on the other end.

#### 2.0 COMPLIANCE WITH NATIONAL STANDARD:

- 2.1 This specification is generally based on I.S. 1280 – 1975 “Specification for foundry moulding boxes of steel construction.”

#### 3.0 MANUFACTURE OF BOX FRAME:

- 3.1 The moulding boxes shall be manufactured from M.S. Plate (I.S. 226). The construction shall Be such that plate will be pressed into channel shape ( C- Shape ) and the two channel shapes Welded together to form the box as indicated clearly in the figure of Table 1 of I.S.1280 – 1975.

#### 4.0 SAND RERAINER:

- 4.1 The boxes should be provided with sand retainer of specified size and continuously welded all Round on top and bottom faces. Ref.Table – I.

REVISION: 01

Prepared by

FOUNDRIES AND PATTERN SHOP

Prepared

Approved

Date

DATE: 31/03/08

31/03/08



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### 5.0 CORRUGATIONS

5.1 The boxes should be provided corrugations on inside ( concave inside, convex outside ) as Per Table – I

### 6.0 OUTSIDE REINFORCEMENT:

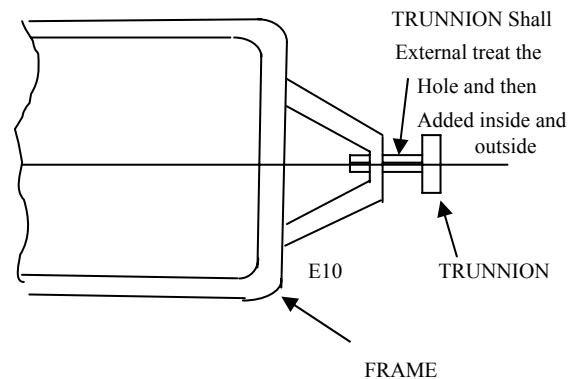
6.1 The boxes should be reinforced outside by welding channel all round as per Table – I of this Specification.

### 7.0 TRUNNIONS:

7.1 All boxes should be provided with machined trunnions for lifting purposes. ( Machined out of Solid bar stock).

Welding of trunnion should be  
As per the sketch, and welded  
From both inside and outside  
Of the handle.

Diameter of TRUNNION: 50mm



### 8.0 WEDGES:

8.1 All the boxes should be provided with wedges for clamping purposes. Wedges on boxes are to be Designed to suit to the clamps of Drg.No. 4-04-365 enclosed.

Size, location and angle of wedges should be correctly maintained, with the help of jigs. This is Important because it has been often observed that clamps when driven on to the wedges do not Fit properly.

If the manufacturer of boxes envisages any change in the design of above ‘ C ‘ clamp the same Can be communicated to BHEL for prior approval.



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#### 9.0 INSIDE REINFORCEMENT:

9.1 Unless otherwise stated on purchase order all boxes up to 1000 \* 1000 size shall be provided with Steel ribs (50 \* 8mm) inside the box two each on length and two each on width side.

For boxes above 1000 \* 1000 size three ribs are to be provided on each side.

#### 10.0 JOINT FACES:

10.1 The joint faces shall be machined so that the joint faces are dead true and parallel.  
Tolerances are as specified at clause 14.0

#### 11.0 LUGS

- 11.1 a) The boxes should have double lugs on each side of the box.
- b) The lugs should be suitable to the bushes specified in drg.no. 3-04-118.
- c) The lugs should be duly machined, drilled and reamed with proper jigs and fixtures to maintain interchangeability of bushes.
- d) The holes in the lugs shall be at right angles to the joint faces.
- e) Both the lugs should be reinforced by welding M.S. Plates vertically.

#### 12.0 PITCH DISTANCE:

12.1 The pitch distance between the bush centers shall be as per Table – I of this specification.  
Tolerances as per cl 14.0.

#### 13.0 BUSHES

- 13.1 a) Bushes shall be manufactured from case hardening steel, case carburised and hardened to 54 to 62 HRC.
- b) The size and dimensions of the bush shall be as per Table – I and drg.no. 3-04-118 enclosed herewith.
- c) The bushes shall be ground inside and outside.
- d) The bushes shall be press fit and tack welded.

#### 14.0 TOLERANCES:

14.1 The tolerance on the centre distance between the guide holes for bushes shall be  $\pm 0.5\text{mm}$ .

14.2 The centre line that is the axis of the guide hole centres shall not shift on either side by more than  $\pm 2\text{mm}$ .



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14.3 Joint faces shall be level and true within the following permissible error in straightness.

Box size:

Permissible Tolerance:

600 \* 600

700 \* 600

700 \* 700

800 \* 700

$\pm 0.5$

800 \* 800

1000 \* 700

1000 \* 800

1000 \* 1000

$\pm 0.75$

250 \* 1000

1250 \* 1250

$\pm 1.0$

1600 \* 1000

$\pm 1.5$

14.4 The following tolerances apply on inside dimensions of boxes.

Inside Size:

Tolerance Permissible:

600 \* 600

700 \* 600

700 \* 700

$\pm 1.5$

800 \* 700

800 \* 800

1000 \* 700

1000 \* 800

1000 \* 1000

$\pm 2.0$


1250 \* 1000


1250 \* 1250

$\pm 2.5$

1600 \* 1000

$\pm 3.0$

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<p>15.0 STRESS RELIEVING</p> <p>15.1. All boxes shall be stress relieved at 600°C - 620°C for a minimum soaking time of 2Hrs.</p> <p>16.0 CONFORMANCE OF BOX SHAPE AND CONSTRUCTION:</p> <p>16.1 The boxes shall be free of all types of weld defects and other process defects. The boxes should Be sound and fit for use in all respects.</p> <p>16.2 The construction, weld joints and other features of the boxes should be similar with standard Boxes already in use in our foundries. In case any clarifications are required, the manufacturer Is advised to contact BHEL before the work is commenced.</p> <p>16.3 The party is at liberty to submit drawings as per this specification for prior consent by BHEL.</p> <p>17.0 INSPECTION</p> <p>17.1 Moulding boxes shall be inspected at supplier's works before dispatch. Boxes shall be offered in unpainted condition.</p> <p>17.2 BHEL representative shall have free entry and access to all areas where the manufacture of boxes Ordered is carried out. All reasonable facilitated shall be provided to him including labour where Necessary.</p> <p>17.3 Heat Treatment charts carried out for stress relieving shall be submitted to BHEL.</p> <p>18.0 PAINTING:</p> <p>18.1 The boxes will be allowed to be painted only after inspection and approval by BHEL.</p> <p>18.2 The boxes should be finished with two coats of heat resisting, black enamel paint prior to Delivery.</p> <p>19.0 MARKING:</p> <p>19.1 Each moulding box shall be marked with the manufacturer's name or trade mark and the size Of the box.</p> <p>20.0 ACCESSORIES:</p> <p>21.1 CLAMPS:</p> <p>Each box shall be supplied with two numbers of clamps i.e., four clamps per pair of boxes, To facilitate clamping.</p> <p>The box supply is deemed complete only when box supply is accompanied by the required Quantity of clamps.</p>		

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<div>20.2 BUSHES ( SPARE )</div> <div>When specifically ordered only bushes shall be supplied as per drawing 3-04-118 in the required type and quantity.</div> <div>21.2 REJECTION AND REPLACEMENT:</div> <div>The final decision regarding acceptance or rejection rests with BHEL if the moulding boxes Are not found as per this specification, at any time during further operations using the moulding boxes. The supplier shall replace the rejected moulding boxes at his own cost and the rejected boxes shall be returned after all commercial terms and conditions are satisfied.</div>		



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**TABLE – I**

(dim. In mm )

Sl. No.	Size of box	Ht.of Box	Th.of box Frame	Pitch dis.of bush	Bush hole ¥	Sand retnr. size	Lugs on Each side of Box	Outside channel reinforcement:	Corrugations
1)	600 * 600	200 250 300 350	8	750	25	16	Double	Single 50 Single 50 Single 50 Single 75	Single
2)	700 * 600	200 250 300 350	8	850	25	16	Double	Single 50 Single 50 Single 75 Single 75	Single
3)	700 * 700	200 250 300 350	8	850	25	16	Double	Single 50 Single 50 Single 75 Single 75	Single
4)	800 * 700 800 * 800	200 250 300 350	8	950	25	16	Double	Single 50 Single 50 Single 75 Single 75	Single
5)	1000 * 700	200 250 300 350	8	1110	25	16	Double	Single 50 Single 75 Single 75 Single 75	Single -do- -do- Double



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**TABLE – I**

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Sl. No.	Size of box	Ht.of Box	Th.of box Frame	Pitch dis.of bush	Bush hole ¥	Sand retnr. size	Lugs on Each side of Box	Outside channel reinforcement:	Corrugations
6)	1000 * 800	200 250 300 350	8	1180	25	16	Double	Single 50 Single 75 Single 75 Single 75	Single -do- -do- Double
7)	1000 * 1000	200 300 400	8	1180	25	16	Double	Single 75 Single 75 Double 50	Single -do- Double
8)	1250 * 1000	200 300 400	12	1450	30	20	Double	Single 50 Single 75 Double 50	Single -do- Double
9)	1250 * 1250	200 300 400	12	1450	30	20	Double	Single 50 Single 75 Double 50	Single -do- Double
10)	1600 * 1000	200 300 400	12	1830	30	20	Double	Single 50 Single 75 Double 50	Single -do- Double