



**Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)**

Piping Centre , 80, G. N. Chetty Road, CHENNAI – 600 017
Phone : 91 (044) 28161245, e-mail: prs@bhelmpc.co.in

REF: ENQ NO: 4100900167

DT: 19.12.2009

Sub: Procurement of butt welded fittings.

Ref: Enquiry No: 4100900167 dt.19-12-09

Please find the following tender documents for reference.

1. List of items
2. Tech. delivery condition TDG: 102:04

Pre qualification is the criteria for consideration for other than BHEL approved vendors. After qualifying for registration, the new vendors may be considered for future requirements, in line with BHEL system and policy. Such vendors will not be considered for this enquiry.

This is a limited tender and only vendors who are contacted through e-mail/courier may submit their offers.

The New vendors may download vendor registration forms from BHEL web site www.bhel.com and relevant data for formal registration.

Manager / Purchase
BHEL / Piping Centre
80,GN Road, T.Nagar
Chennai-600017
Ph:28161243/245

SL.. NO	MC	DESCRI	QTY / NO
1	921174690000	ECC RED 559X54 /457X43 SA234WP91	5
2	921174710000	BW CON RED 711 X 25/ 610X 23 SA234WP91	2
3	921174730000	ECC RED 965 X 32 / 762 X 25 SA234WP91	1
4	921174950000	REDUCER OD 508X99 /OD457 X 43 SA234WP91	14
5	921174960000	REDUCEROD 762 X 25/OD 660 X 35 SA234WP91	6
6	921174980000	REDUCEROD786X38/OD762X 25SA234WP91	6
7	921174990000	REDUCEROD814X52/OD762X25 SA234WP91	6
8	921175050000	REDUCEROD762X25/OD711X23 SA234WP91	6
9	921175110000	RED OD 813X28/OD 762X25 SA234WP91	6



1.0 CODES:-

The fittings shall meet Indian Boiler Regulations (IBR) and the following requirements in addition to the standards specified in the Purchase Order (PO).

2.0 RAW MATERIALS:-

- a) All pipes used for fittings shall meet the respective specification. The test certificate shall be furnished.
- b) All mother pipes used for fittings shall be subjected to a hydraulic test as per SA 530 or UT as per ASTM E 213 at the mill
- c) All plates used for fittings shall be UT tested as per S1 of SA578 and acceptance norms shall be as per Level B of SA578
- d) The raw material forging shall be ultrasonically tested as per SA 388 and the acceptance norm shall be as per 3.3.4 of ASME Sec VIII Div 2.
- e) Steel for SA182 F11, F12 & F22 if indigenously procured, to be from following manufacturers approved under IBR for creep resistant steels: i) Alloy Steel Plant Durgapur, ii) Tata Iron & Steel company, Jamshedpur & iii) Mahindra Ugine Steel Company, Mumbai.
- f) Carbon content of SA 234 WPB, WPC, SA 105 fittings shall be restricted to 0.25% max

3.0 PROCESS:-

- a) Process of manufacture shall conform to applicable standards.
- b) All fittings shall be of seamless unless otherwise specified in the purchase order.
- c) In case of welded fittings, WPS, PQR & welder qualification shall be approved by BHEL - PC, prior to start of welding.
- d) All fittings shall have smooth surfaces, workman like finish and free from loose scales and defects like laps, seams, folds, cracks, pitting etc.. Repair by welding is NOT permitted.
- e) Dimensions shall be as per ASME B16.9 or B16.28, Butt Weld edges shall be as given in Purchase Order. The ends of reducers shall have a straight portion of Minimum 13mm.
- f) Unless otherwise specified in the P.O SA 234 WP 11/12/22 fittings shall be supplied as per class 1, SA 182 F11/12 shall be supplied as class 2, SA 182 F22 shall be of class 3 only .

4.0 HEAT TREATMENT:-

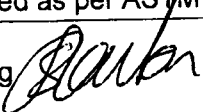
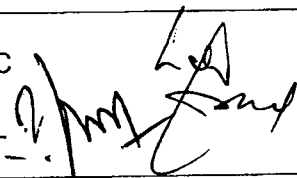
4.1 All fittings shall be heat treated as below.

SA 234 WP B	- As per specification
SA 105, SA234 WP C	- Normalised
SA234 WP11/ WP12/ WP22	- Normalised & Tempered
SA182 F11/ F12/ F22	- Normalised & Tempered
Stainless Steel :-	
SA 182 F304/ 316/ 321/ 347	- Solution annealed
SA 403 WP304/ 316/ 321/ 347	- Solution annealed

4.2 Fittings conforming to SA 234 WP91 and SA182 F91 shall be normalised at 1040 to 1070 deg C (for wall thickness larger than 75 mm, accelerated cooling may be done to obtain a fully martensitic structure) and tempered at 760 $\pm$ 10 deg C

5.0 TESTING :-

- (a) All ferrous fittings shall be tested by MPI as per ASTM E-709 and SS fittings shall be LPI tested as per ASTM E 165.

S. Jayakumar, Engg  Approved by K. Vedaprasad, QC
P. Elangovan, QA  K. Ganeshan, MPL 



- (b) One fitting of each specification, heat, heat treatment lot and size shall be subjected to Tension Test as per applicable standard.
- (c) All fittings of wall thickness above 6mm or NB 200mm and above shall be Ultrasonically Tested as per SA 388; acceptance norms shall be 3.3.4 of ASME section VIII Div.2.
- (d) Hardness test shall be carried out on each fittings of WP91 / F91. For other fittings hardness shall be checked on 10% of the fittings.
- (e) In case of welded fittings; all the welds shall be 100% RT tested and acceptance norms shall be UW 51 of ASME Sec VIII DIV-1
- (f) The following supplementary tests shall be carried out for specifications namely SA105, SA 182 F11 / F12 / F22 / F91, SA 234 WPC / WP11 / WP12 / WP22 / WP91 (No supplementary test applicable for SA 234 WPB)
 - a) Product analysis – one / heat / size.
 - b) Tension test – one / heat / heat treatment lot / size.
- (g) Metallography:- Metallography shall be carried out on one per heat, per size, per heat treatment lot of WP91 / F91 fittings. Acceptance norms - The Material shall be free from any micro fissures. Microstructure shall show tempered martensite and also to be examined for any grain growth. Photomicrograph with 500x (Min) magnification along with Metallography report to be provided. The actual magnification shall be indicated.

6.0 POSITIVE MATERIAL IDENTIFICATION (PMI) FOR ALLOY STEEL FITTINGS.

Each alloy steel fitting shall be checked for the correctness of the material during manufacturing and final inspection using X-ray fluorescence principle or spark emission spectrography.

7.0 PAINTING , COLOUR CODING, MARKING, PACKING & END PROTECTION

7.1 **PAINTING** : All fittings (except stainless steel and galvanised) shall be **painted** on the external surface as given below

- a) surface preparation : Blast cleaning
 - b) Primer coat : 50 microns of Red oxide zinc phosphate confirming to IS 12744
 - c) Final coat : 70 microns of Synthetic enamel paint confirming to IS2934 .
 - d) Shade : (i) smoke grey – shade no 692 of IS5 for all carbon steel fittings
(ii) Sea green -- shade no 217 of IS5 for all Alloy steel fittings
- The internal surface shall be protected with rust preventive coating or rust inhibitor. Stainless steel and Galvanised fittings need not be painted.

7.2 **COLOUR CODING** : All fittings shall be colour coded circumferentially at ends as given below

SA 234 WPB / WPBW	=	Red
WPC / SA105	=	Blue

S. Jayakumar, Engg

P. Elangovan, QA

Approved by

K. Vedaprasad, QC

K. Ganeshan, MPL



WP11 / SA182 F11	=	Green & White
WP12 / SA182 F12	=	Black & Red
WP22 / SA182 F22	=	Blue & Red
WP91 / SA182 F91	=	Brown & Red
SA182 / SA 403 F / WP 304	=	Blue & Yellow
316	=	Black & Green
321	=	Blue & Brown
347	=	Yellow & Black

7.3 MARKING :

7.3.1 The fittings dispatched to **BHEL Stores** shall be punched / etched with Material code, Heat number, material specification, maker's emblem, Inspectors seal and Statutory authorities seal (as applicable).

In addition, the above details along with size shall be paint stenciled on the fittings.

If the thickness of the fitting is less than 6 mm, punching is not permitted and the above details shall be paint stenciled only. Fittings of size up to 2" (50mm) shall be tied together and the above details shall be punched / etched in a separate tag and tied to it.

7.3.2 The fittings dispatched directly to project site as **DTS** shall be punched and paint stenciled with DU code (14 digit work order du detail) as given by purchase in addition to marking done as per para 7.3.1.

7.4 **PACKING AND END PROTECTION :** Machined ends of the fittings shall be well protected using end caps and fittings shall be suitably packed in box / crate to avoid transit & other damages.

8.0 INSPECTION & CERTIFICATION : -

All fittings are to be Inspected at the manufacturer's works by the Inspection agencies / authorities as per IBR and as indicated in the P.O. Inspection certificate in IBR Form III C shall be submitted along with the Work Test Certificate countersigned by the above authorities and shall include the following.

1. Test Certificate Number & date.
2. BHEL P.O Number & Amendment Number
3. BHEL P.O. Serial Number
4. BHEL TDC Number
5. Size-wise Quantity
6. Specification, Grade & Year of code.
7. Heat/Melt Number
8. Starting material details.
9. Steel making process
10. Ladle Analysis of Raw Material and product analysis of fitting.
- *11. Positive Material Identification (PMI) report for Alloy steel fittings.
- *12. Supplementary Test(Product analysis, Tension test..) results.
- *13. Heat Treatment Chart.
- *14. NDE report. (VISUAL,MPI, LPI,UT)
- *15. Tensile Test Report
- *16. Hardness Test Report

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P. Elangovan, QA

Approved by

K. Vedaprasad, QC

K. Ganeshan, MPL



17. Metallography Report along with photomicrograph with 500x (min) magnification.
- *18. Dimensional conformance.
- *19. RT test report / Results (for welded fittings)
- *20. Guarantee of HTP shall be given as follows:- "Fittings are capable of withstanding without failure, leakage or impairment of their serviceability a hydrostatic test pressure equal to that prescribed for the specified matching pipe of equivalent material".

*Details furnished in the Tests certificate in lieu of chart/report is acceptable.

9.0 RECORDS OF REVISION :-

Rev 01 : a) Fully revised for better clarity.

: b) Para 2.0 e added.

Rev 02 : a) Para 2.0 (c): UT acceptancy norms revised from level A to B.

Rev 03 : a) Fully revised for better clarity.

: b) Para 4.2,6.0, 8.0 (11) added.

c) Para 2 (d) ,4.1, 5 (d) are revised.

Rev 04 : a) Para 5.0 (g), 7.0 and 8.0 (17) are revised.

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Approved by

K. Vedaprasad, QC

K. Ganeshan, MPL

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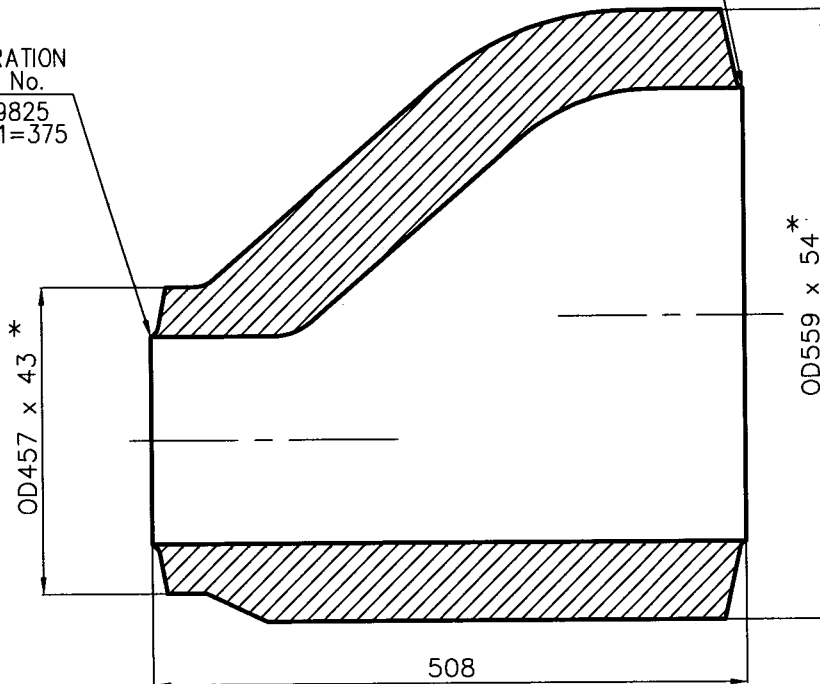
ALL DIMENSIONS ARE IN MILLIMETRES

REV	DATE	ALTERED
		APPROVED

EDGE PREPARATION
AS PER DRG No.
3-80-300-19825
FIGURE-X, d1=375

EDGE PREPARATION
AS PER DRG No.
3-80-300-19825
FIGURE-X, d1=460

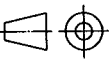
12.5



NOTES:-

01. ALL DESIGN REQUIREMENTS SHALL CONFORM TO ASME B16.9 & A234 WP91.
02. MANUFACTURING, INSPECTION AND TESTING SHALL BE AS PER IBR, ASME B16.9 & SA234.
03. THIS DRAWING IS FOR INDICATING THE OVER ALL DIMENSIONS, CONNECTING PIPE SIZE AND MATERIAL SPECIFICATION.
04. * INDICATED DIMENSIONS ARE THOSE OF CONNECTING PIPE.

	ECCENTRIC REDUCER OD559x54/OD457x43		92 117 469 0000	A		475	000
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			MATL. SPECN.			DI	QTY.

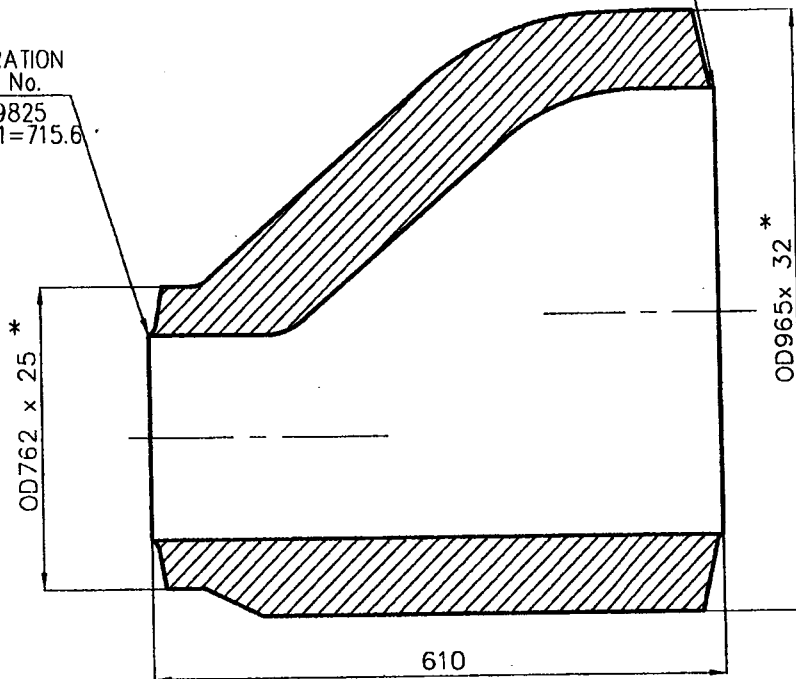
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				DRN		S.PALANI	05.02.09				
				CHD		VENKAT	05.02.09				
				APPD		K.V.RAMANI	05.02.09				
DEPT	GRADE OF UNTOLD DIM		SCALE	WEIGHT (KG).	BHEL PO REF.NO:			ITEM NO.	NO. OF ITEMS		
CODE	C / M / F		N.T.S	475.000							
TITLE				CARD CODE	DRAWING NO.			REV			
ECCENTRIC REDUCER OD559X54/OD457X43				U 01	4-80-301-68291			00			

Size A4

REV	DATE	ALTERED
		APPROVED

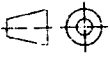
EDGE PREPARATION
AS PER DRG No.3-80-300-19825
FIGURE-X, d1=903

12.5

EDGE PREPARATION
AS PER DRG No.3-80-300-19825
FIGURE-X, d1=715.6**NOTES:-**

01. ALL DESIGN REQUIREMENTS SHALL CONFORM TO ASME B16.9 & A234 WP91.
02. MANUFACTURING, INSPECTION AND TESTING SHALL BE AS PER IBR, ASME B16.9 & SA234.
03. THIS DRAWING IS FOR INDICATING THE OVER ALL DIMENSIONS, CONNECTING PIPE SIZE AND MATERIAL SPECIFICATION.
04. * INDICATED DIMENSIONS ARE THOSE OF CONNECTING PIPE.

	ECCENTRIC REDUCER OD965x32/OD762x25	92 117 473 0000 SA 234 WP91	A	300	000
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
		MATL. SPECN.	C	DI	QTY.

 BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		NAME		SIGN	DATE	NO. OF VAR		
		DRN	S. PALANI		05.02.09			
		CHD	VENKAT		05.02.09			
		APPD	K. V. RAMANI		05.02.09			
DEPT	GRADE OF UNTOL DIM	 SCALE N.T.S	WEIGHT (KG)		BHEL PO REF. NO.		ITEM NO.	NO. OF ITEMS
CODE	C / M / F		300.000					
TITLE			CARD CODE	DRAWING NO.			REV	
ECCENTRIC REDUCER OD965X32/OD762X25			U 01	4-80-310-68292			00	

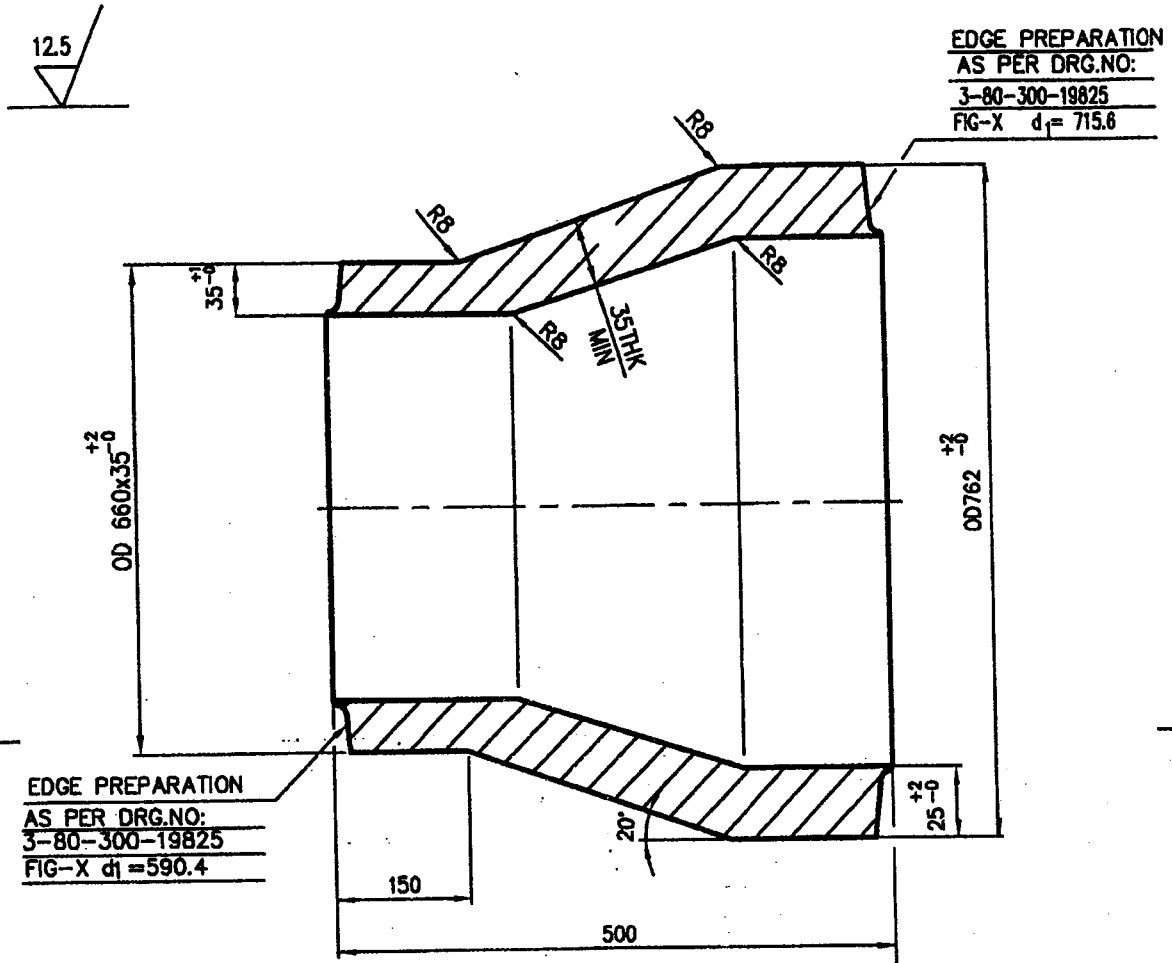
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REV	DATE	ALTERED
01		APPROVED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

- 1) DESIGN PRESSURE : 48.6 Kg/sq.cm(g)
- 2) DESIGN TEMPERATURE : 568°C



	REDUCER OD762x25/OD660x35	92 117 496 0000 SA234WP91	A	304	000
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
		MATL. SPECN.	C	DI	QTY.

		BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN SUDHAKAR	NAME SUDHAKAR	SIGN 	DATE 17.08.09	NO.OF VAR
DEPT CODE	GRADE OF UNTOL.DIM C / M / F		SCALE N.T.S	WEIGHT (KG). 304.000	BHEL PO REF.NO:		ITEM NO.	NO. OF ITEMS
TITLE REDUCER (OD762x25/OD660x35)				CARD CODE U 01	DRAWING NO. 4-80-310-69297			REV 00

Size A4

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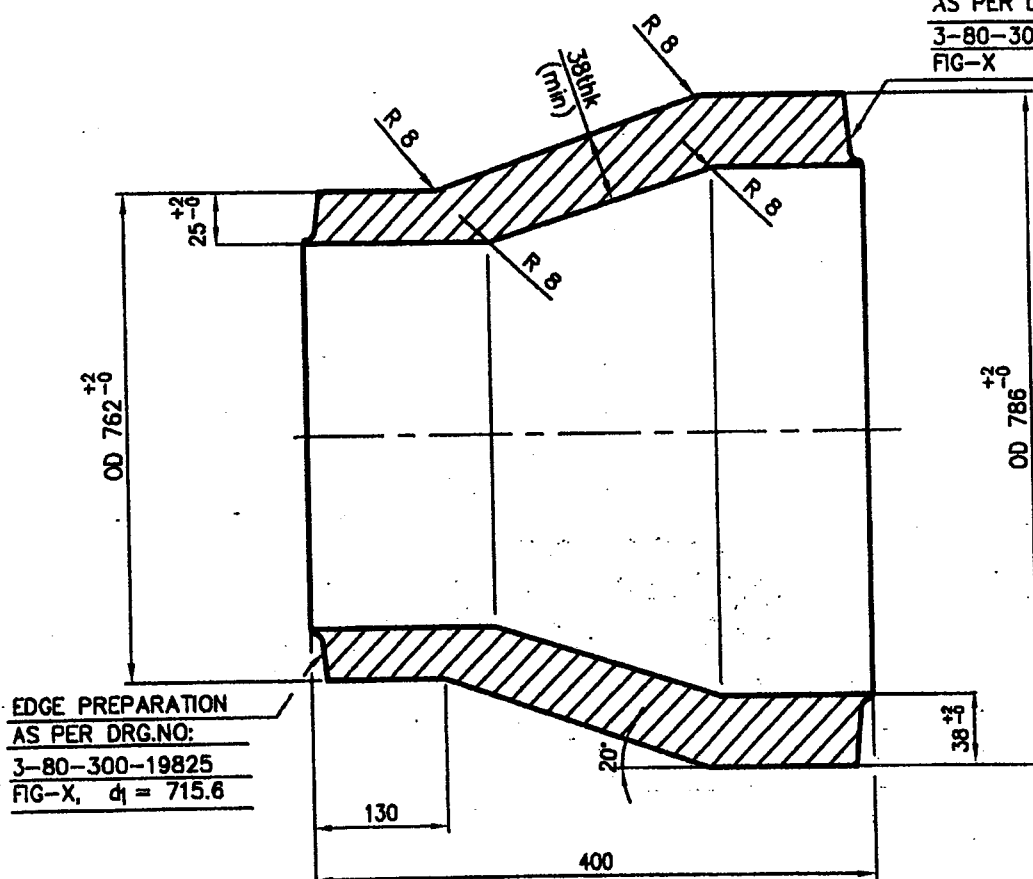
ALL DIMENSIONS ARE IN MILLIMETRES

12.5

NOTES :-

1. DESIGN PRESSURE : 48.6 Kg/Cm² (g)
2. DESIGN TEMPERATURE : 568° C

EDGE PREPARATION
AS PER DRG.NO:
3-80-300-19825
FIG-X d₁ = 710



EDGE PREPARATION
AS PER DRG.NO:
3-80-300-19825
FIG-X, d₁ = 715.6

	REDUCER	92 117 498 0000	A	248	000
	OD 786x38/OD 762x25	SA234WP91			
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
		MATL. SPECN.	C	DI	QTY.

		BHARAT HEAVY ELECTRICALS LIMITED		DRN	NAME	SIGN	DATE	NO. OF
		PIPING CENTRE		CHD	SUDHAKAR		17.08.09	VAR
		CHENNAI- 600 017		APPD	PARAM		17.08.09	
DEPT	GRADE OF	SCALE	WEIGHT (KG).	BHEL PO REF.NO:		ITEM NO.	NO. OF	
CODE	UNTOL.DIM	N.T.S	248.000				ITEMS	
	C / M / F							
TITLE			CARD CODE	DRAWING NO.				REV
REDUCER			U 01	4-80-311-69299				00
(OD786x38/OD762x25)								

Size A4

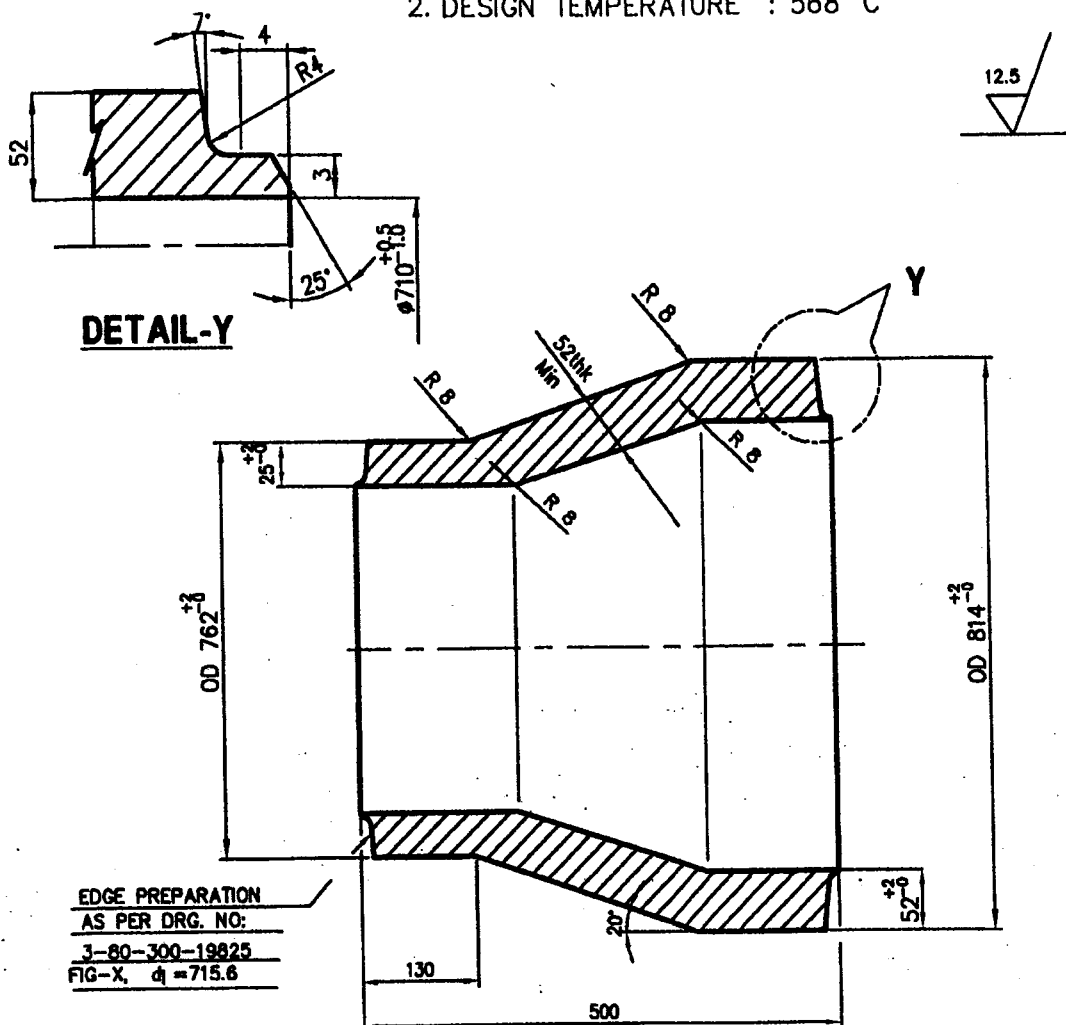
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REV	DATE	ALTERED
01		APPROVED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES :-

- DESIGN PRESSURE : 48.6 Kg/Cm² (g)
- DESIGN TEMPERATURE : 568° C



EDGE PREPARATION
AS PER DRG. NO:
3-80-300-19825
FIG-X, d_i = 715.6

	REDUCER OD 814x52/OD762x25	92 117 499 0000 SA234WP91	A	415 000
VAR NO.	DESCRIPTION	MATL. CODE MATL. SPECN.	A C DI	UNIT WT.(Kg) QTY.



BHARAT HEAVY ELECTRICALS LIMITED
PIPING CENTRE
CHENNAI- 600 017

DRN	NAME SUDHAKAR	SIGN	DATE 17.08.09	NO. OF VAR
CHD	SUDHAKAR		17.08.09	
APPD	PARAM		17.08.09	

DEPT	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG).	BHEL PO REF.NO:	ITEM NO.	NO. OF ITEMS
CODE	C / M / F	N.T.S	415.000			
TITLE	REDUCER (OD814x52/OD762x25)			CARD CODE U 01	DRAWING NO. 4-80-311-69300	REV 00

Size A4

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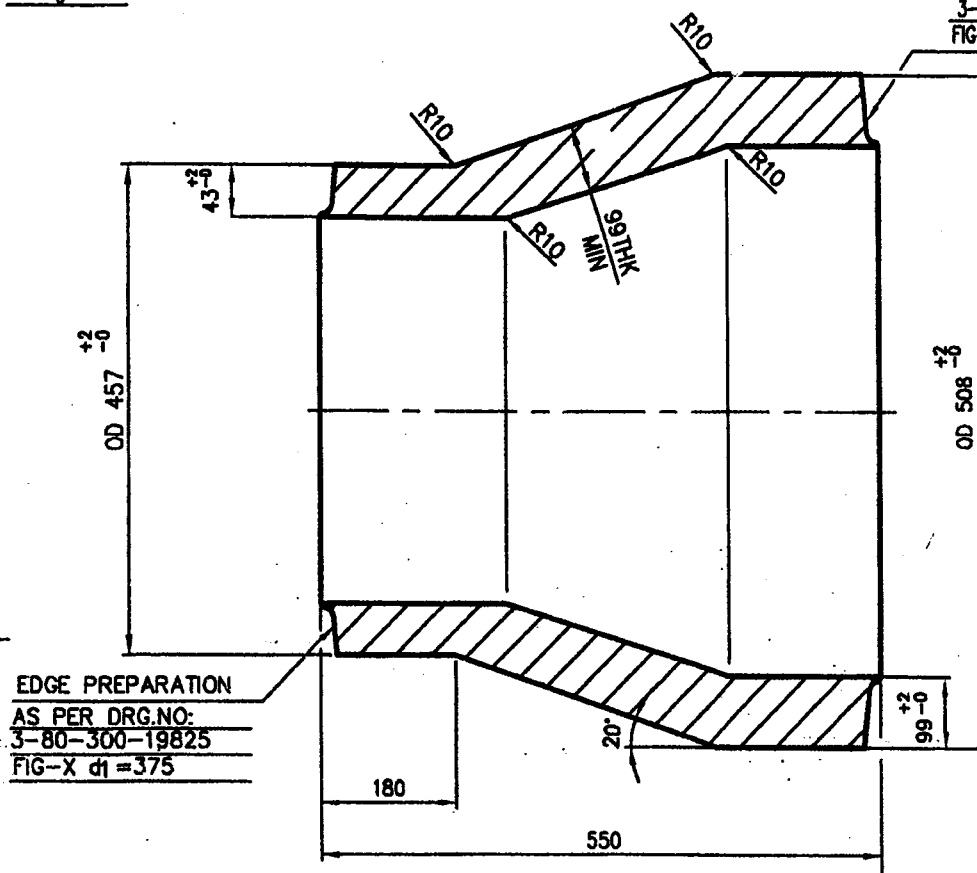
ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

- 1) DESIGN PRESSURE : 192 Kg/sq.cm(g)
- 2) DESIGN TEMPERATURE : 540°C



EDGE PREPARATION
AS PER DRG.NO:
3-80-300-19825
FIG-X d₁ = 310



EDGE PREPARATION
AS PER DRG.NO:
3-80-300-19825
FIG-X d₁ = 375

	REDUCER OD508x99/OD457x43		92 117 495 0000	A		435	000
			SA234WP91				
VAR NO.	DESCRIPTION	STD	MATL. CODE	A C	UNIT	UNIT.WT.(Kg)	
			MATL. SPECN.		DI	QTY.	

		BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	NAME	SIGN	DATE	NO.OF VAR
				CHD	SUDHAKAR		17.08.09	
				APPD	PARAM		17.08.09	
DEPT	GRADE OF UNTOLO.DIM		SCALE	WEIGHT (KG).	BHEL PO REF.NO:		ITEM NO.	NO. OF ITEMS
CODE	C / M / F		N.T.S	435.000				
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REDUCER (OD508x99/OD457x43)				U 01	4-80-300-69302		00	

Size A4

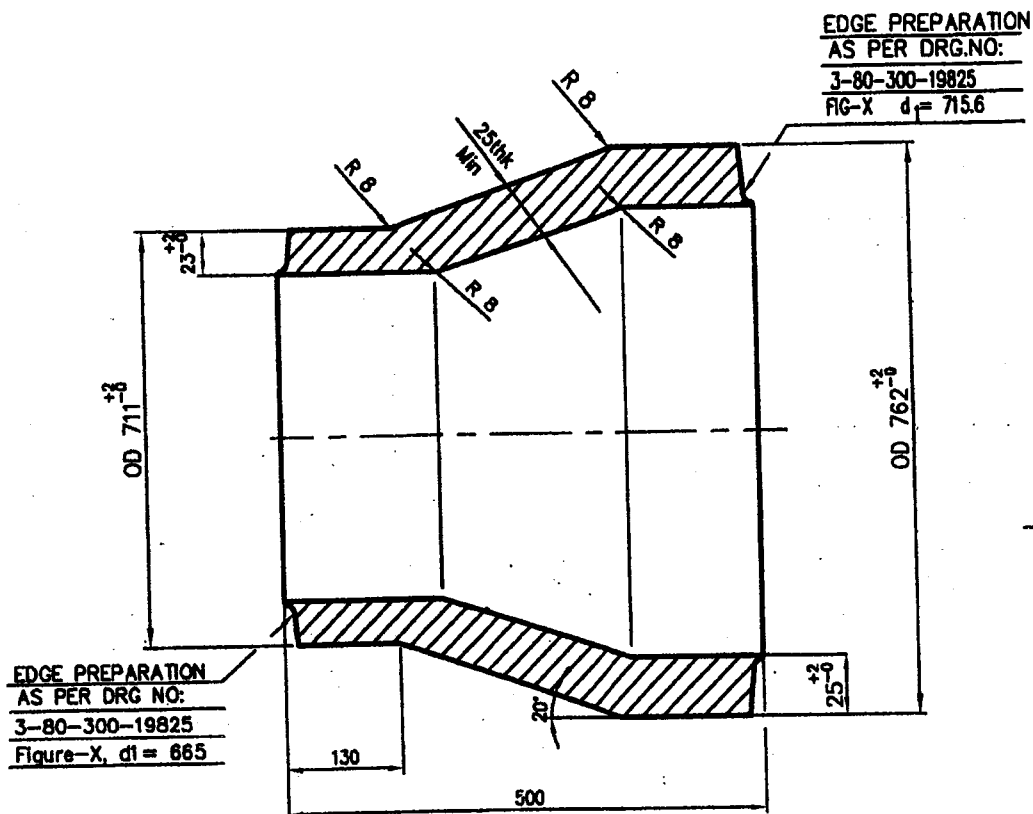
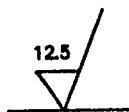
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REV	DATE	ALTERED
01		APPROVED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES :-

- DESIGN PRESSURE : 29.04 Kg/Cm² (g)
- DESIGN TEMPERATURE : 560° C



VAR NO.	REDUCER OD 762x25/OD711x23	STD	92 117 505 0000 SA234WP91	A	UNIT	217 000
DESCRIPTION			MATL. CODE	A	DI	UNIT.WT.(Kg)
						QTY.

BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI- 600 017				ORN CHD APPD	NAME SUDHAKAR SUDHAKAR PARAM	SIGN 	DATE 20.08.09 20.08.09 20.08.09	NO. OF VAR
DEPT	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG).	BHEL PO REF.NO:		ITEM NO.	NO. OF ITEMS	
CODE	C / M / F	N.T.S	217.000					
TITLE REDUCER (OD762x25/OD711x23)				CARD CODE U 01	DRAWING NO. 4-80-312-69328		REV 00	

Size A4

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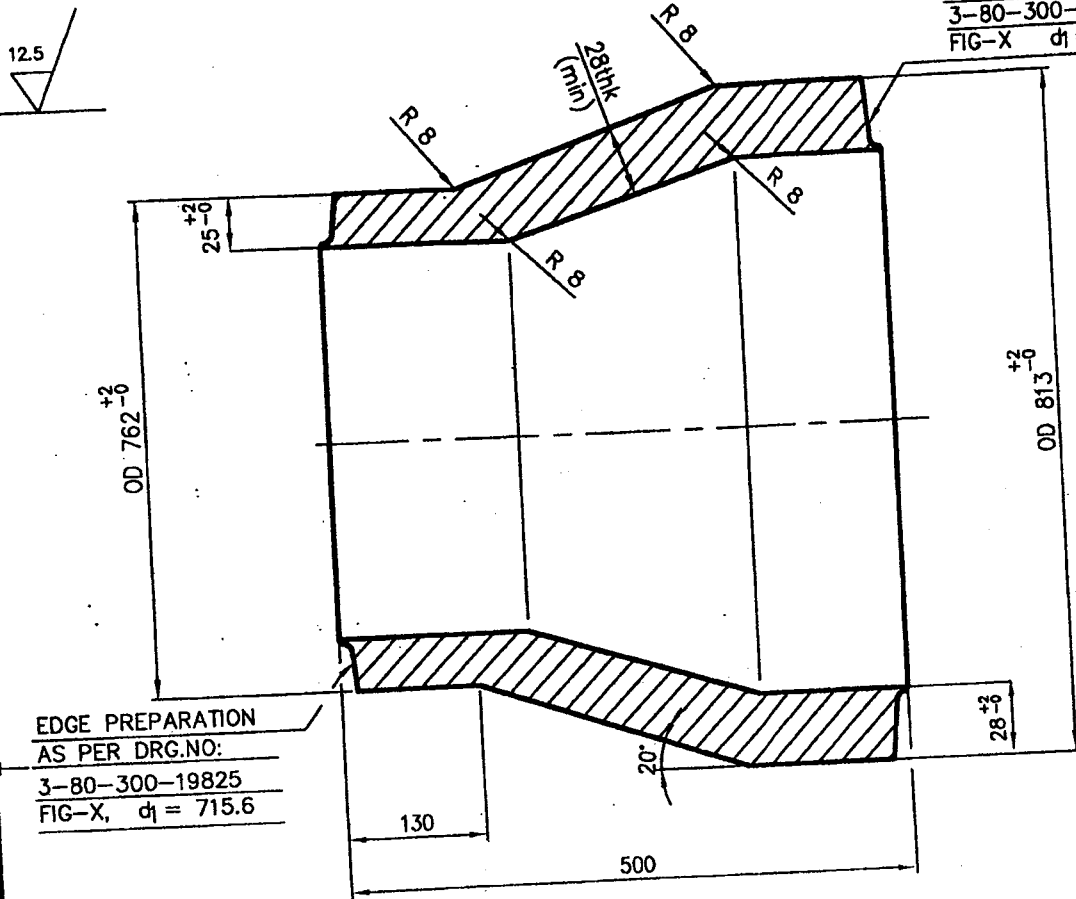
REV	DATE	ALTERED
01		APPROVED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES :-

- DESIGN PRESSURE : 29.1 Kg/Cm² (g)
- DESIGN TEMPERATURE : 568° C

EDGE PREPARATION
AS PER DRG.NO:
3-80-300-19825
FIG-X d₁ = 757

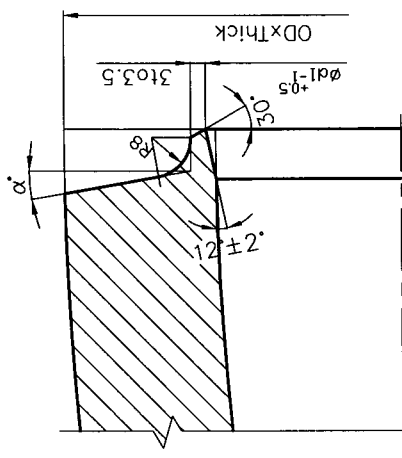


EDGE PREPARATION
AS PER DRG.NO:
3-80-300-19825
FIG-X, d₁ = 715.6

REDUCER OD 813x28/OD 762x25		92 117 511 0000	A	259	000
SA234WP91					
VAR NO.	DESCRIPTION	STD	MATL. CODE		UNIT.WT.(Kg)
			MATL. SPECN.		QTY.

		BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI- 600 017		DRN	NAME	SIGN	DATE	NO. OF VAR
				CHD	SUDHAKAR		07.10.09	
				APPD	PARAM		07.10.09	
DEPT	GRADE OF UNTOL.DIM		SCALE	WEIGHT (KG).	BHEL PO REF.NO:		ITEM NO.	NO. OF ITEMS
CODE	C / M / F		N.T.S	259.000				
TITLE				CARD CODE	DRAWING NO.			REV
REDUCER (OD813x28/OD762x25)				U 01	4-80-312-69525			00

Size A4



$\alpha^* = 6^\circ$ FOR WALL THICKNESS ≤ 30 mm.
 $\alpha^* = 10^\circ$ FOR WALL THICKNESS > 30 mm.

FIGURE—Xf

CAUTION

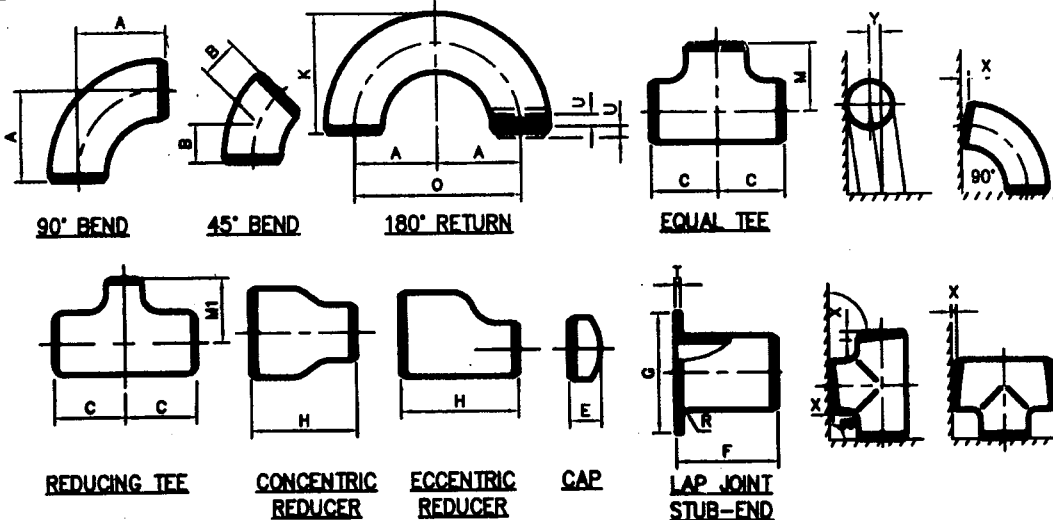
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STANDARD									
	BHARAT HEAVY ELECTRICALS LTD., PIPING CENTRE, CHENNAI, 600 017				NAME	SIGN	DATE		
					DRN		19.01.2009		
					CHD		19.01.2009		
					APPD	M.N.VASUDEVAN	19.01.2009		
REV 01	DATE	ALTERED APPROVED	DEPT.	GRADE OF UN TOL DIM C/M/F	SCALE N.T.S.	WEIGHT (Kg).	REF TO ASSY / OLD DRG.		
			CODE					CARD CODE U 01	DRAWING No. 3-80-999-97744
			TITLE BW EP FOR WP91 ASMEB16.9 FITTINGS						
REV 00									

REV	DATE	ALTERED
01	05.02.05	APPROVED <i>[Signature]</i> APMK

TITLE BLOCK AND DRAWING ALTERED

(REFERENCE : ISR ,REG.NO 381(A) INCLUDED IN AMENDMENT)



ALL FITTINGS				90° & 45° ELBOWS AND TEES	REDUCER	180° RETURNS			CAPS	LAP-JOINT		STUB END	
DN.	O.D AT BEVEL	I.D AT END	WALL THICKNESS	CENTER TO END A,B,C,M,M1	OVERALL LENGTH H	CENTER TO CENTER O	BACK TO FACE K	ALIGNMENT OF END U	OVER ALL LENGTH E	END TO END F	RADIUS R	DIA OF LAP G	THICKNESS OF LAP
15 TO 85	+1.6 -0.8	±0.8	NOT LESS THAN 87 1/2% OF NOMINAL THICKNESS	±1.6	±1.6	±6.4	±6.4	±0.8	±3.2	±1.6	+0 -0.8	+0 -0.8	+1.6 -0
80 TO 90	±1.6	±1.6		±1.6	±1.6	±6.4	±6.4	±0.8	±3.2	±1.6	+0 -0.8	+0 -0.8	+1.6 -0
100	±1.6	±1.6		±1.6	±1.6	±6.4	±6.4	±0.8	±3.2	±1.6	+0 -0.8	+0 -0.8	+1.6 -0
125 TO 200	+2.4 -1.6	±1.6		±1.6	±1.6	±6.4	±6.4	±0.8	±6.4	±1.6	+0 -0.8	+0 -0.8	+1.6 -0
250 TO 400	+4.0 -3.2	±3.2		±2.4	±2.4	±9.5	±6.4	±1.6	±6.4	±2.4	+0 -1.6	+0 -1.6	+1.6 -0
500 & ABOVE	+6.4 -4.8	±4.8		±2.4	±2.4	±9.5	±6.4	±1.6	±6.4	±2.4	+0 -1.6	+0 -1.6	+1.6 -0

OFF-SQUARE TOLERANCES		
NOMINAL SIZE OF FITTING	OFF SQUARE TOLERANCE, X	OFF SQUARE TOLERANCE, Y
UP TO AND INCLUDING 100	0.8	1.6
125 TO 150	1.2	2.4
200 TO 550	1.6	3.2
600 & ABOVE	3.2	6.4

NOTES : 1. ALL DIMENSIONS ARE IN MILLIMETRES

STANDARD

BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	NAME	SIGN	DATE	NO. OF VAR	
		CHD	R.ANANTH	Sd	15.10.1986		
		APPD	J.JUDE	Sd	15.10.1986		
DEPT	GRADE OF UNTOL DIM	SCALE N.T.S	WEIGHT (KG).	REF. TO ASSY./OLD DRG.		ITEM NO.	NO. OF ITEMS
CODE	C / M / F		-	-	-	-	
TITLE			CARD CODE	DRAWING NO.		REV	
TOLERANCES ON FITTINGS			U 01	4-80-301-26192		01	