

**QUALITY ASSURANCE REQUIREMENTS FOR THREE LAYER POLYPROPYLENE (3LPP) COATED
SA 106Gr.B PIPE STRAIGHTS & BENDS**

A. Pipe Manufacturing and Coating:

1. The Pipe shall be as per **ASME SA 106Gr.B. and the Carbon content shall be limited to maximum of 0.25%.**
2. Requirements of 3LPP coating and testing shall be as per DIN 30678.
3. 3LPP Coating thickness, Un-coated pipe length at the end and Pipe edge preparation shall be as per the drawing attached.
4. Surface Profile measurement after blast cleaning shall be as per ASTM D4417 Method C.
5. The Vendor shall submit documented (1) 3LPP coating Procedure and (2) 3LPP coat testing procedure and (3) Vendor Quality Plan for 3LPP coated Pipe and bends along with bid.
6. Vendor to get approval for (1) 3LPP coating Process, (2) 3LPP coat testing procedure and (3) Vendor Quality Plan for 3LPP coated Pipe and bends from BHEL before commencing the production.
7. The Vendor shall adhere to the validated Quality Plan, Processes and Procedures. In case of violation, BHEL will enforce CHP and 100% Witness.

B. Preservation and Marking:

1. Inside surface of the pipe shall be coated with a readily water-soluble corrosion inhibitor such as a solution of 0.5% sodium nitrite, 0.25% monosodium phosphate and 0.25% di-sodium phosphate to protect against atmospheric corrosion during storage and transit.
2. Translucent rust preventive coating / paint, which can be easily removable by wire brush shall be applied on outside surface of the uncoated pipe ends to protect against atmospheric corrosion during storage and transit.
3. Pipe end preparations shall be coated with weldable primer and shall be protected from mechanical damage during handling, storage.
4. Following the application of corrosion inhibitors, all pipe ends shall be covered, capped or otherwise shielded to avoid contamination or corrosion.
5. Pipe identification markings and coating marking shall be stenciled on inside surface and on coated outside surface of each pipe. Paints used for stenciling shall be free of Halides, Chromates, Sulphur, Lead, Tin and Mercury.
6. Pipe identification shall be hard stamped on uncoated ends of each pipe using round nose or interrupted dot die stamps having a minimum nose radius of 0.8 mm.

O/C

92861-008-8

DRAWING No.

NOTES: -

01. APPLICABLE FOR P91 MATERIAL
02. FOR OD MISMATCHING REF. FIGURE-Xa.
03. $\alpha = 6^\circ$ FOR WALL THICKNESS ≤ 30 mm
04. $\alpha = 10^\circ$ FOR WALL THICKNESS > 30 mm

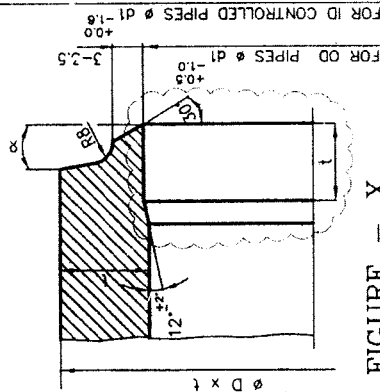


FIGURE - X

MATCHING EDGE PREPARATION FOR MISMATCH OD
DIAMETRICALLY GREATER THAN 8 mm
(ie OD1 - OD2 > 8mm) APPLICABLE FOR
- ELBOWS OTHER THAN P91 MATERIALS

NOTES: -

01. OD = OUTSIDE DIA OF CONNECTING PIPE (STRAIGHT) TO BE PHYSICALLY MEASURED/VERIFIED.
02. t = THK OF CONN. PIPE (STRAIGHT)

MATCHING EDGE PREPARATION FOR MISMATCH OD
DIAMETRICALLY GREATER THAN 8 mm
(ie OD1 - OD2 > 8mm) APPLICABLE FOR
BENDS/FITTINGS OF P91 MATERIALS

NOTES: -

01. OD OF STRAIGHT TO BE PHYSICALLY MEASURED/VERIFIED.
02. $\alpha = 6^\circ$ FOR WALL THICKNESS ≤ 30 mm
03. $\alpha = 10^\circ$ FOR WALL THICKNESS > 30 mm

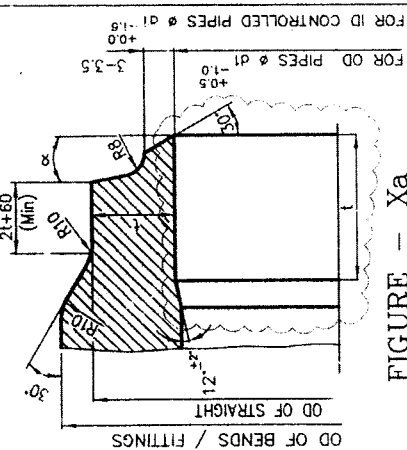


FIGURE - Xa

GENERAL NOTES:

01. THE MINIMUM THICKNESS AT WELD END SHALL NOT BE LESS THAN
 - a) 0.875 TIMES t NOM. FOR OD PIPES.
 - b) t MIN. FOR ID CONTROLLED PIPES.
02. t NOM & t MIN SHALL BE AS PER SPECIFIED PIPE SIZE.

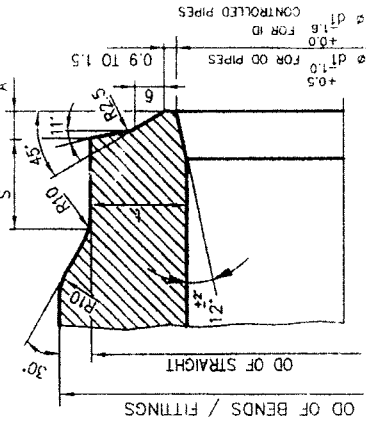
NOTES FOR WELDING:

01. WELD REINFORCEMENT TO BE FLUSH GROUND AND MERGED WITH PARENT METAL WITHOUT ANY UNEVENNESS.

MATCHING EDGE PREPARATION FOR MISMATCH OD
DIAMETRICALLY GREATER THAN 8 mm
(ie OD1 - OD2 > 8mm) APPLICABLE FOR
BENDS/FITTINGS OTHER THAN P91 MATERIALS

NOTES: -

01. OD OF STRAIGHT TO BE PHYSICALLY MEASURED/VERIFIED.
02. WHEN t < 65, S+A = 65 Min. & t > 65, S=65 Min. WHERE t = THK OF CONN. PIPE (STRAIGHT).



STYLE - Pa

STYLE - P

- NOTES: -
01. USE WHEN t ≥ 14.2 mm.
 02. FOR OD MISMATCHING REF. FIGURE-Pa

STYLE - D

NOTES: -

01. USE WHEN t < 14.2 mm.

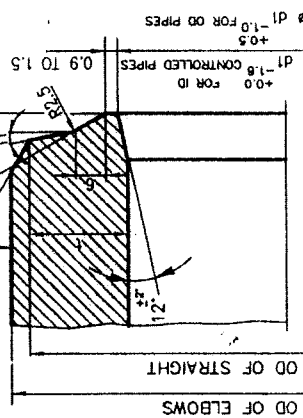
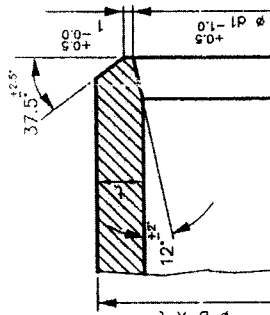


FIGURE - Z

STANDARD

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

BHARAT HEAVY ELECTRICALS LTD.
PIPING CENTRE, CHENNAI

NO OF

DATE

SIGN

NAME

BY

DATE

ITEM

No.

REV

U 01

3-80-300-19825

01

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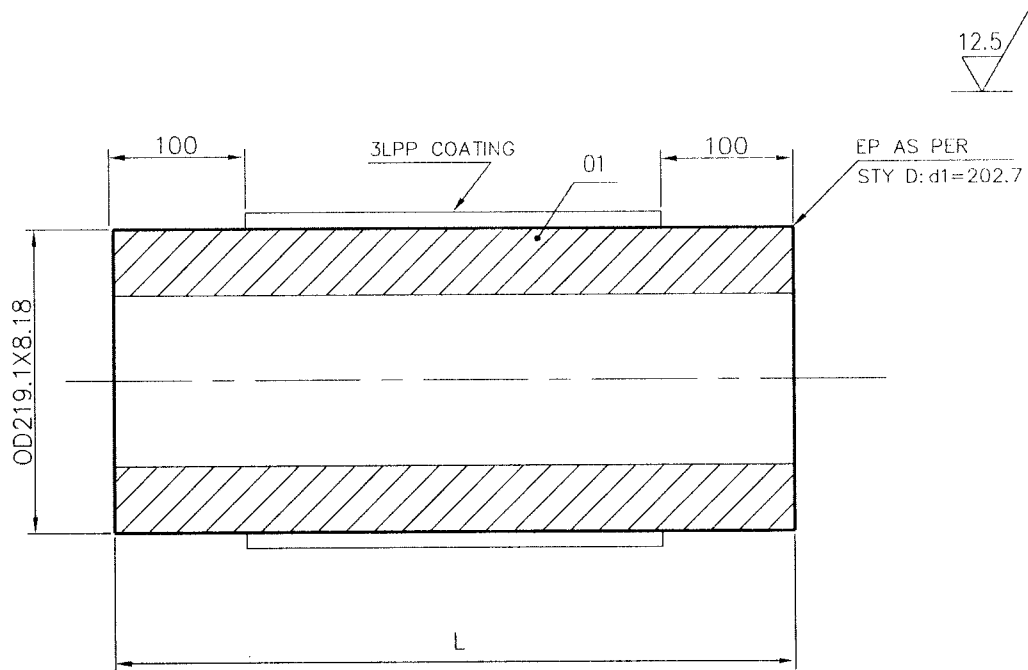
01

ALL DIMENSIONS ARE IN MILLIMETRES

REV	DATE	ALTERED :
01		APPROVED :

NOTES

01. 3LPP COATING AS PER DIN 30678 (THK - 3.05MM)
02. FOLLOW APPLICABLE QP
03. INDIVIDUAL PIPE LENGTH L = 6500 to 12500mm
04. TOTAL LENGTH OF THE PIPE L = 10500M
05. EDGE PREPARATION WITH SQUARE ENDS AS PER DRG.NO. 3-80-300-19825



01	PIPE L = 10500 OD219.1 X 8.18	15 082 099 0000 SA 106 Gr.B	C	446775 000
ITEM NO.	DESCRIPTION	MATL. CODE	A	UNIT
		MATL. SPECN.	C	DI
				QTY.

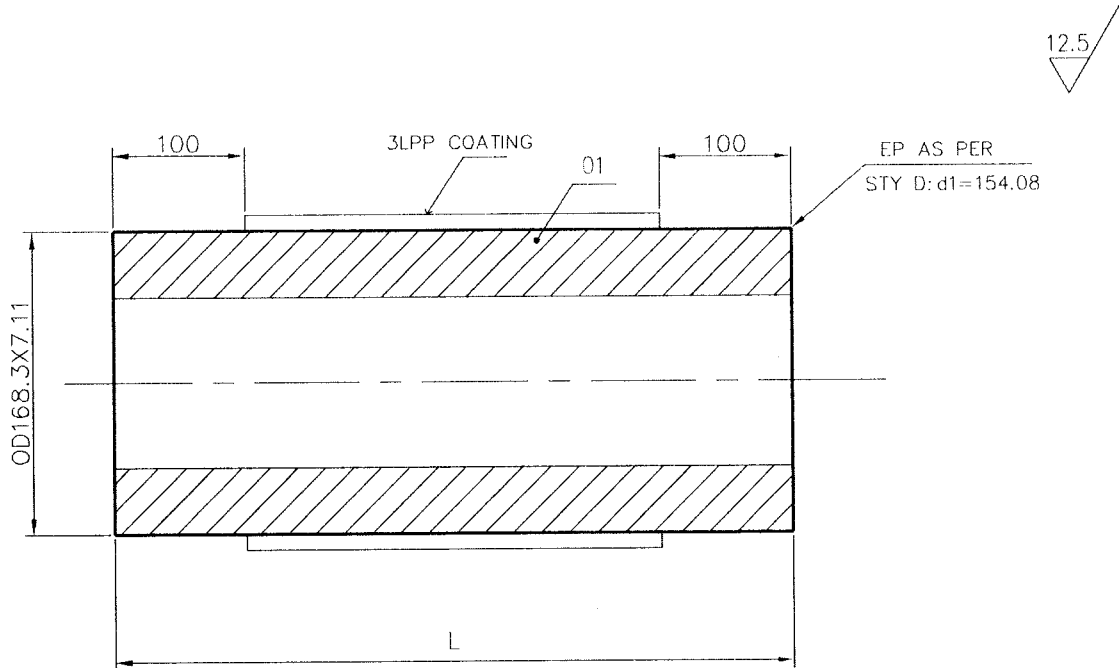
BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		NAME		SIGN	DATE	NO. OF VAR	
		DRN	S.SENTHIL				11.09.08
		CHD	K.RAJITHA				11.09.08
		APPD	C.V.NATHAN				11.09.08
DEPT	GRADE OF TOL. DIM	SCALE N.T.S	WEIGHT (KG).		REF. TO ASSY./OLD DRG.	ITEM NO.	NO. OF ITEMS
CODE	C / M / F		446775				
TITLE			CARD CODE	DRAWING NO.		REV	
PIPE OD 219.1 X 8.18 (3LPP COATED)			U 01	4-80-993-67802		00	

ALL DIMENSIONS ARE IN MILLIMETRES

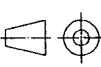
REV	DATE	ALTERED :
01		APPROVED :

NOTES

01. 3LPP COATING AS PER DIN 30678 (THK=3.05MM)
02. FOLLOW APPLICABLE QP
03. INDIVIDUAL PIPE LENGTH L = 6500 to 12500mm
04. TOTAL LENGTH OF THE PIPE L = 10500M
05. EDGE PREPARATION WITH SQUARE ENDS AS PER DRG.NO. 3-80-300-19825



01	PIPE L = 10500 OD168.3 X 7.11	15 082 411 0000 SA 106 Gr.B	C	296730 000
ITEM NO.	DESCRIPTION	MATL. CODE MATL. SPECN.	A C DI	UNIT QTY.

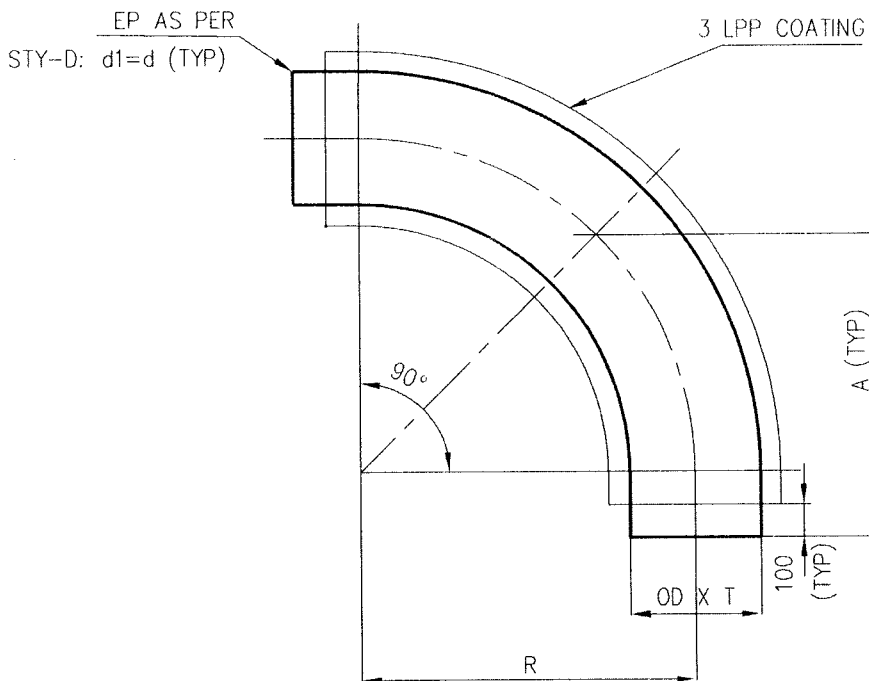
 BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		NAME		SIGN	DATE	NO. OF VAR	
		DRN	S.SENTHIL		08.09.08		
		CHD	K.RAJITHA		08.09.08		
		APPD	C.V.NATHAN		08.09.08		
DEPT	GRADE OF TOL. DIM	 SCALE N.T.S	WEIGHT (KG)		REF. TO ASSY./OLD DRG.	ITEM NO.	NO. OF ITEMS
CODE	C / M / F		296730				
TITLE			CARD CODE	DRAWING NO.		REV	
PIPE OD 168.3 X 7.11 (3LPP COATED)			U 01	4-80-993-67803		00	

REV	DATE	ALTERED
		CHECKED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

1. 3LPP COATING AS PER DIN 30678
(THK : 3.05 MM).
2. FOLLOW APPLICABLE QP.
3. MIN THK. AFTER BENDING SHALL BE 7.3 MM.
4. EP AS PER DRG. 3-80-300-19825.



VAR NO	NB	d	A	R	(OD X T ; L) DESCRIPTION	MATL CODE	MATL SPECN	UNIT WT (Kg)	QTY
02	150	154.08	1914	762	PIPE OD 168.3X7.11 L = 3500	15 082 411 0000 SA 106 GrB	C	98.910	1
01	200	202.7	1968	1016	PIPE OD 219.1 X 8.18 L = 3500	15 082 099 0000 SA 106 GrB	C	148.925	1



BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI 620014.

DRN	NAME	SIGN	DATE	NO. OF VAR
CHD	S.SENTHIL		11.09.08	
APPD	K.RAJITHA		11.09.08	
	C.V.NATHAN		11.09.08	

TITLE	CARD CODE	DRAWING NO.	REV
90 DEG BEND R-5D (3LPP COATED)	U 01	4-80-993-67804	00

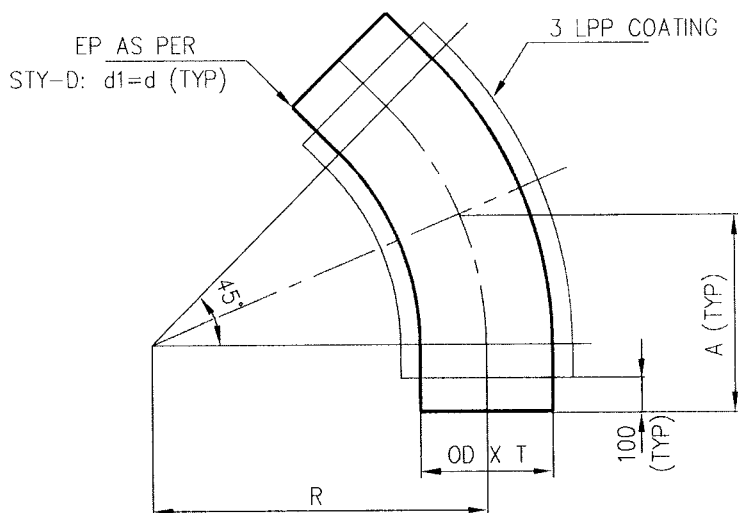
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REV	DATE	ALTERED
		CHECKED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

1. 3LPP COATING AS PER DIN 30678
THK: 3.05 MM.
2. FOLLOW APPLICABLE QP.
3. MIN THK. AFTER BENDING SHALL BE 7.3 MM.
4. EP AS PER DRG. 3-80-300-19825.



02	150	154.08	1767	762	PIPE OD 168.3 X 7.11 L = 3500	15 082 411 0000 SA 106 GrB	C	98.910 1
01	200	202.7	1772	1016	PIPE OD 219.1 X 8.18 L = 3500	15 082 099 0000 SA 106 GrB	C	148.925 1
VAR NO	NB	d	A	R	(OD X T ; L) DESCRIPTION	MATL CODE MATL SPECN	A C	UNIT WT (Kg) QTY

	BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014.	DRN	NAME S.SENTHIL	SIGN	DATE 11.09.08	NO.OF VAR
		CHD	K.RAJITHA		11.09.08	
		APPD	C.V.NATHAN		11.09.08	
TITLE 45 DEG PIPE BEND R-5D (3LPP COATED)		CARD CODE U 01	DRAWING NO. 4-80-993-67805			REV 00

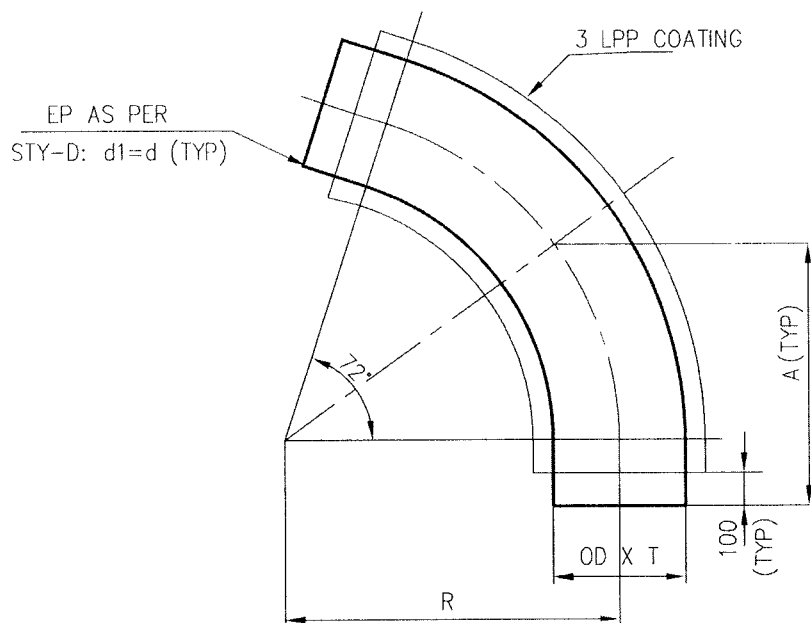
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REV	DATE	ALTERED
		CHECKED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

1. 3LPP COATING AS PER DIN 30678 (THK - 3.05 MM).
2. FOLLOW APPLICABLE QP.
3. MIN THK. AFTER BENDING SHALL BE 7.3 MM.
4. EP AS PER DRG. 3-80-300-19825.



02	150	154.08	1825	762	PIPE OD 168.3 X 7.11 L = 3500	15 082 411 0000 SA 106 GrB	C	98.910 1
01	200	202.7	1851	1016	PIPE OD 219.1 X 8.18 L = 3500	15 082 099 0000 SA 106 GrB	C	148.925 1
VAR NO	NB	d	A	R	(OD X T ; L) DESCRIPTION	MATL CODE MATL SPECN	A C	UNIT WT (Kg) QTY



BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI 620014.

DRN	NAME	SIGN	DATE	NO. OF VAR
CHD	S.SENTHIL		11.09.08	
APPD	K.RAJITHA		11.09.08	
	C.V.NATHAN		11E.09.08	

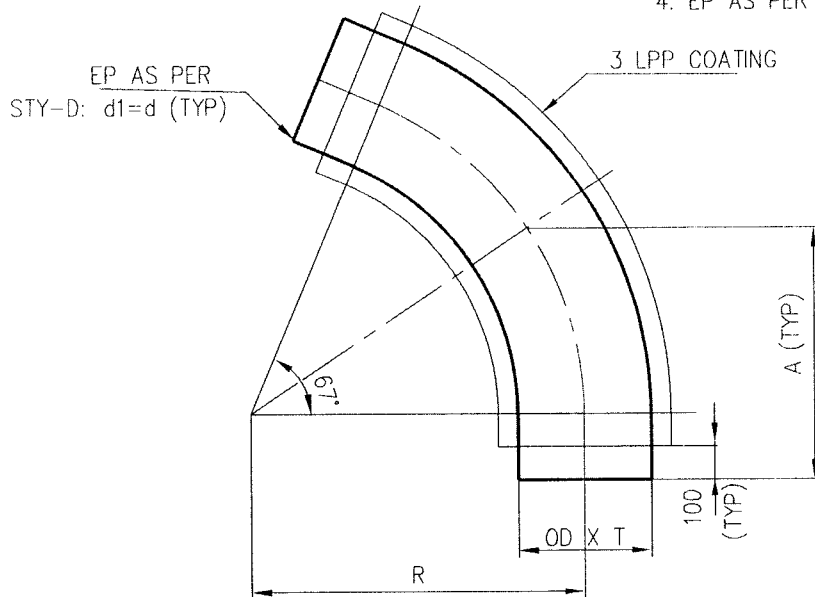
TITLE	CARD CODE	DRAWING NO.	REV
72 DEG PIPE BEND R-5D (3LPP COATED)	U 01	4-80-993-67806	00

REV	DATE	ALTERED
		CHECKED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

1. 3LPP COATING AS PER DIN 30678 (THK: 3.05 MM).
2. FOLLOW APPLICABLE QP.
3. MIN THK. AFTER BENDING SHALL BE 7.3 MM.
4. EP AS PER DRG. 3-80-300-19825.



02	150	154.08	1809	762	PIPE OD 168.3 X 7.11 L = 3500	15 082 411 0000 SA 106 GrB	C	98.910 1
01	200	202.7	1829	1016	PIPE OD 219.1 X 8.18 L = 3500	15 082 099 0000 SA 106 GrB	C	148.925 1
VAR NO	NB	d	A	R	(OD X T ; L) DESCRIPTION	MATL CODE MATL SPECN	A C	UNIT WT (Kg) QTY



BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI 620014.

DRN	NAME	SIGN	DATE	NO. OF VAR
CHD	S.SENTHIL		11.09.08	
APPD	K.RAJITHA		11.09.08	
	C.V.NATHAN		11.09.08	

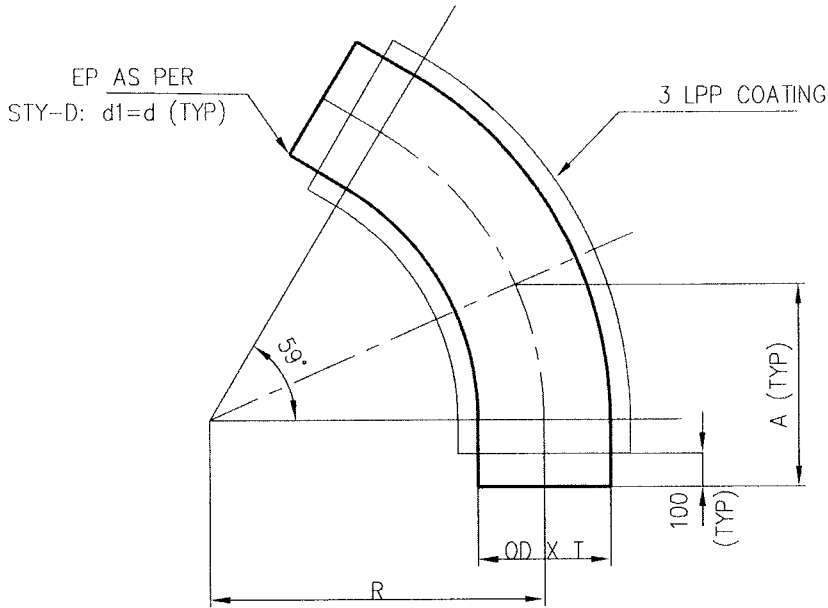
TITLE	CARD CODE	DRAWING NO.	REV
67 DEG BEND R-5D (3LPP COATED)	U 01	4-80-993-67807	00

REV	DATE	ALTERED
		CHECKED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

1. 3LPP COATING AS PER DIN 30678.
(THK: 3.05 MM)
2. FOLLOW APPLICABLE QP.
3. MIN THK. AFTER BENDING SHALL BE 7.3 MM.
4. EP AS PER DRG. 3-80-300-19825.



02	150	154.08	1790	762	PIPE OD 168.3 X 7.11 L = 3500	15 082 411 0000 SA 106 GrB	C	98.910 1
01	200	202.7	1802	1016	PIPE OD 219.1 X 8.18 L = 3500	15 082 099 0000 SA 106 GrB	C	148.925 1
VAR NO	NB	d	A	R	(OD X T ; L) DESCRIPTION	MATL CODE MATL SPECN	A C	UNIT WT (Kg) QTY



BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI 620014.

DRN	NAME	SIGN	DATE	NO. OF VAR
CHD	S.SENTHIL		11.09.08	
APPD	K.RAJITHA		11.09.08	
	C.V.NATHAN		11.09.08	

TITLE	CARD CODE	DRAWING NO.	REV
59 DEG BEND R-5D (3LPP COATED)	U 01	4-80-993-67808	00