

PIN-



CIN - L23201MH1959GOI011388

Vendor Code:.....

We are pleased to forward here with a document for your reference and action.
For any further clarifications please use following contact information:

Enquiry Number : RBRM25F004/2439553
Document Date : 10.01.2025
Name & Designation : ,
EMAIL :
PH :
FAX :

Corporate Website: <http://www.iocl.com/>
Corporate Tenders Site: <http://www.IndianOilTenders.com/>

Regd. Office: G-9, Ali Yavar Jung Marg, Bandra(E), Mumbai-51, India

ENQUIRY CUM OFFER

Enquiry No.:RBRM25F004/2439553
Date:10.01.2025

Sr.no.Item Code and Description	Unit	Qty	Unit Price (to be filled) In fig&words
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Barauni Refinery : 22.000EA

0020 4346238744 EA 88.000 |.....
each

4 100 SCH.40

BREAKUP OF QUANTITY

Barauni Refinery : 88.000EA

0030 4346238754 EA 48.000 |.....
each

6 150 SCH.40

BREAKUP OF QUANTITY

Barauni Refinery : 48.000EA

0040 4346231843 EA 92.000 |.....
each

ELBO,90,LR,BW,CS,A234,WPB,INT.EPOXY COATED,8IN,40

BREAKUP OF QUANTITY

Barauni Refinery : 92.000EA

GROUP: 2

FITTINGS, ELBOW, 90, LONG RADIUS
MATERIAL : CARBON STEEL
MANUFACTURING PROCESS : SEAMLESS
MATERIAL SPECIFICATION : ASTM A234
GRADE : WPB
END FINISH : BUT WELD
SUPPLIMENTARY REQUIREMENT: INT:EPOXY CTD
NPS NPS PRESSURE RATING [LBS]

Signature of Vendor with Office Seal

ENQUIRY CUM OFFER

Enquiry No.:RBRM25F004/2439553
Date:10.01.2025

Sr.no.Item Code and Description	Unit	Qty	Unit Price (to be filled) In fig&words
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FITTINGS, ELBOW, 90, LONG RADIUS
MATERIAL : CARBON STEEL
MANUFACTURING PROCESS : WELDED
MATERIAL SPECIFICATION : ASTM A234
GRADE : WPB-W
END FINISH : BUT WELD
SUPPLIMENTARY REQUIREMENT: INT:EPOXY CTD
NPS NPS PRESSURE RATING [LBS]
OR SCHEDULE NUMBER
INCH MM

0070	4475422402	EA	25.000
		each		
	14 356	30	STD	

BREAKUP OF QUANTITY
Barauni Refinery : 25.000EA

0080	4475422654	EA	32.000
		each		
	16 406	STD		

BREAKUP OF QUANTITY
Barauni Refinery : 32.000EA

0090	4475422832	EA	28.000
		each		
	SIZE- 18"			

BREAKUP OF QUANTITY
Barauni Refinery : 28.000EA

Signature of Vendor with Office Seal

ENQUIRY CUM OFFER

Enquiry No.:RBRM25F004/2439553

Date:10.01.2025

Sr.no.	Item Code and Description	Unit	Qty	Unit Price (to be filled) In fig&words
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0100	4475422914	EA	29.000
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20	508	20	STD	
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BREAKUP OF QUANTITY

Barauni Refinery : 29.000EA

GROUP: 5
FITTINGS, MISCELLANEOUS

0110	4399971374	EA	16.000
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TEE, EQ, A234, WPB-S, BW, 3IN, STD, INT COATED

BREAKUP OF QUANTITY

Barauni Refinery : 16.000EA

GROUP: 6
FITTINGS, TEE, EQUAL
MATERIAL : CARBON STEEL
MANUFACTURING PROCESS : SEAMLESS
MATERIAL SPECIFICATION : ASTM A234
GRADE : WPB
END FINISH : BUTT WELD
ADDITIONAL REQUIREMENTS : EPOXY COATED
NPS NPS PRESSURE RATING [lbs]
OR SCHEDULE NUMBER
Inch mm

Signature of Vendor with Office Seal

ENQUIRY CUM OFFER

Enquiry No.:RBRM25F004/2439553
Date:10.01.2025

Sr.no.	Item Code and Description	Unit	Qty	Unit Price (to be filled) In fig&words
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0120	4466131442	EA	18.000
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4	102	40	STD	
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BREAKUP OF QUANTITY

Barauni Refinery : 18.000EA

GROUP:

7

FITTINGS, TEE, EQUAL

MATERIAL : CARBON STEEL

MANUFACTURING PROCESS : WELDED

MATERIAL SPECIFICATION : ASTM A234

GRADE : WPB-W

END FINISH : BUT WELD

SUPPLEMENTARY REQUIREMENT: INT:EPOXY CTD

NPS NPS PRESSURE RATING [LBS]

OR SCHEDULE NUMBER

INCH MM

0130	4466111684	EA	14.000
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6	152	40	STD	
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BREAKUP OF QUANTITY

Barauni Refinery : 14.000EA

0140	4466111844	EA	10.000
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8	203	40	STD	
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BREAKUP OF QUANTITY

Signature of Vendor with Office Seal

ENQUIRY CUM OFFER

Enquiry No.:RBRM25F004/2439553
Date:10.01.2025

Sr.no.Item Code and Description	Unit	Qty	Unit Price (to be filled) In fig&words
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Barauni Refinery	:	10.000EA	
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0150 4466112042		EA 8.000
		each	

10 254	40	STD	
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BREAKUP OF QUANTITY

Barauni Refinery	:	8.000EA	
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0160 4466112214		EA 6.000
		each	

12 305		STD	
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BREAKUP OF QUANTITY

Barauni Refinery	:	6.000EA	
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GROUP:

8

FITTINGS,REDUCER CONCENTRIC
MATERIAL : CARBON STEEL
MANUFACTURING PROCESS : SEAMLESS
MATERIAL SPECIFICATION : ASTM A234
GRADE : WPB
END FINISH : BUTT WELDED
ADDITIONAL REQUIREMENTS : INTERNALY EPOXY COATED
NPS X NPS PRESSURE RATING/SCHEDULE
NUMBER
INCH X INCH

0170 4416056102		EA 8.000
		each	

10X6		STDXSTD	
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Signature of Vendor with Office Seal

ENQUIRY CUM OFFER

Enquiry No.:RBRM25F004/2439553

Date:10.01.2025

Sr.no.Item Code and Description	Unit	Qty	Unit Price (to be filled) In fig&words
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BREAKUP OF QUANTITY

Barauni Refinery : 8.000EA

0180 4416057312 EA 12.000 |.....
each

SIZE- 12X10 IN

BREAKUP OF QUANTITY

Barauni Refinery : 12.000EA

GROUP:

9

FITTINGS, ELBOW, 45, LONG RADIUS

MATERIAL : CARBON STEEL

MANUFACTURING PROCESS : SEAMLESS

MATERIAL SPECIFICATION : ASTM A234

GRADE : WPB

END FINISH : BUT WELD

SUPPLIMENTARY REQUIREMENT: INT :EPOXY CTD

NPS NPS PRESSURE RATING [LBS]

OR SCHEDULE NUMBER

INCH MM

0190 4348651194 EA 12.000 |.....
each

3 76 40 STD

BREAKUP OF QUANTITY

Barauni Refinery : 12.000EA

Signature of Vendor with Office Seal

ENQUIRY CUM OFFER

Enquiry No.:RBRM25F004/2439553

Date:10.01.2025

Sr.no.	Item Code and Description	Unit	Qty	Unit Price (to be filled) In fig&words
	INCH MM			
0230	4348692062	EA	12.000
	ELBOW, 45, LR, A234, WPB-W, BW, 10IN, STD, INTERNALLY EPOXY COA	each		
	BREAKUP OF QUANTITY Barauni Refinery	:	12.000EA	
0240	4348692214	EA	48.000
	12 305 STD	each		
	BREAKUP OF QUANTITY Barauni Refinery	:	48.000EA	
0250	4348692402	EA	10.000
	SIZE- 14"	each		
	BREAKUP OF QUANTITY Barauni Refinery	:	10.000EA	
0260	4348692574	EA	14.000
	16 406 30 STD	each		
	BREAKUP OF QUANTITY Barauni Refinery	:	14.000EA	

Signature of Vendor with Office Seal

ENQUIRY CUM OFFER

Enquiry No.:RBRM25F004/2439553

Date:10.01.2025

Sr.no.	Item Code and Description	Unit	Qty	Unit Price (to be filled) In fig&words
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0270	4348692832 SIZE- 18"	EA	12.000 each
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BREAKUP OF QUANTITY
Barauni Refinery : 12.000EA

0280	4348692914	EA	10.000 each
20	508	20	STD	

BREAKUP OF QUANTITY
Barauni Refinery : 10.000EA

Signature of Vendor with Office Seal

ENQUIRY CUM OFFER

Enquiry No.:RBRM25F004/2439553

Date:10.01.2025

Important:

~~1. You are requested to fill this format in all respects and forward us Sealed cover so as to reach us on the due date .This tender will be opened at 15 Hrs. IST on the due date. Enquiry No.& Due date must be SUPERSCRIBED on the envelope to avoid any outright rejection.~~

~~2. Please see our terms and conditions and mention deviation ,if any, seperately.~~

~~3. Confirm whether the tenderer is a relative of any Director of IOCL or the tenderer is a firm in which Director(s) of IOCL or his relative is a partner or tenderer is a company in which any Director, or his relative is a member or Director.(If desired, List of IOCL Directors can be referred in IOCL Website)(YES/NO)~~

~~(If YES, details are to be furnished.)~~

~~4.Vendors are required to fill up details of Terms and Conditions and Taxes in the format attached as last page.~~

~~5.The tenderers should respond to the tender either by submitting their bid or by explaining the reason for non-submission of the offer.In case, there is no response either way continuously for three times, names of such tenderers may be removed from the vendor list.~~

~~6.If the bidder is registered with NSIC under Ministry of Micro, Small and Medium enterprises, then, the bidder shall enclose the copy ofthe recent valid NSIC certificate without fail. The details of the sameare to be mentioned in this page.~~

DOCUMENT TEXT

1. Vendor must supply the material as per IOCL Technical Specification and item text.
2. Vendor must supply the material as per JOB SPECIFICATION FOR INTERNAL COATING OF CS FIRE WATER PIPING FITTINGS (enclosed) as well as latest standard.
3. The materials shall be inspected by IOCL approved TPI inspector. TPI inspector shall generate certificates as per approved QAP/ITP. IRN (Inspection Release Note) from TPI shall also be the part of the certificates.
4. Third party is to confirm that all tests have been carried out as per codes & Pipe fittings to meet all requirements of code & standard.
5. Vendor must provide material test certificate and inspection release note along with material supply.

Signature of Vendor with Office Seal

ENQUIRY CUM OFFER

Enquiry No. :RBRM25F004/2439553

Date:10.01.2025

6. Colour coding of fittings as per Annexure-B are to be reviewed by IOCL approved Third Party Inspection Agencies.

~~The tenders will be opened in the presence of bidders, who desire to be present, at 15.00 Hrs IST on the scheduled due date.~~

~~Yours faithfully,
For and on behalf of~~

~~INDIAN OIL CORPORATION LTD.
(Authorised Signatory)~~

Signature of Vendor with Office Seal

(Contd)

ENQUIRY CUM OFFER

Enquiry No.:RBRM25F004/2439553

Date:10.01.2025

~~Enq.Due on:27.01.2025 15:00hrs IST~~

~~Format for Details of Terms & conditions to be Filled By Vendor~~

~~Offer Ref. Date~~
~~GST Registration Number:~~
~~GST Classification:~~
~~NSIC Registration No for Micro/Small Scale Enterprises:~~
~~Telephone No. Price basis:~~
~~Fax No. Free Delivery at~~
~~Email F.O.R/EX WORKS:.....~~
~~Delivery Days~~
~~Offer Valid Till~~
~~Payment Terms~~

~~NOTE: 1. VENDOR TO INDICATE THE FOLLOWING CHARGES (IN PERCENTAGE OF QUOTED BASIC PRICE) AS EXTRA OR INCLUSIVE (Please tick the appropriate box).~~
~~2. If charges are mentioned but 'Extra' or 'Inclusive' is not indicated, then it will be considered as Extra. If no rates are provided, then it will be considered as Inclusive in quoted basic price unless otherwise specified elsewhere.~~
~~3. If invoice shall be provided by any other GST registration number please provide the address and GST registration number~~

	Inclusive	Extra
a. GST		
(i) IGST.....	[]	[]
(ii) CGST.....	[]	[]
(iii) SGST.....	[]	[]
(iii) UTGST.....	[]	[]
(iv) CESS.....	[]	[]
b. Packing & Forwarding	[]	[]
c. Inspection charge including Third party if asked in Tender.....	[]	[]
d. Freight upto IOCL destination	[]	[]
e. Transit Insurance upto IOCL destination.....	[]	[]
f. Discount On quoted basic unit price.....		
g. (i) Price gouted are as per DGS&D rate contract(Yes/No)		
(ii) If yes Contract ref.....		

**TECHNICAL NOTES
FOR
BUTT WELDED, SOCKET WELDED
AND SCREWED PIPE FITTINGS**

TECHNICAL NOTES FOR BUTT WELDED, SOCKET WELDED AND SCREWED FITTINGS

1.0 GENERAL

- 1.1 Chemical composition, physical properties, tests, dimensions and tolerances, heat treatment and marking shall conform to the applicable latest codes / standards / specifications as specified. For any special requirement please refer material requisition sheet.

2.0 TESTING

- 2.1.1 Test reports shall be supplied for all mandatory tests as per the material specifications/ applicable code/ standards. Test reports shall also be furnished for any supplementary tests as specified. Material test certificates (physical properties, chemical composition & heat treatment report) shall also be furnished for fittings supplied. For alloy steel fittings Mill test certificate containing above information shall be furnished.
- 2.1.2 PMI test : Positive material identification test to be performed at vendors works on alloy steel fittings/ stainless steel and clad fittings. The extent of PMI examination will be 100%.
- a) For welded fittings PMI shall be performed on base metal as well as weldments.
 - b) Whenever any sample drawn to PMI test on the basis of percentage selection fails to meet specification requirements, 100% of items of lot shall be tested for PMI.
- 2.2 All fittings shall be seamless in construction unless otherwise specified. If fittings are specified as welded, the same shall conform to clause 2.6. Seamless fittings are acceptable in place of welded fittings, however, welded fittings are not acceptable in place of seamless fittings.
- 2.3 Outside diameters and wall thickness (unless otherwise mentioned) of butt welded fittings shall be in accordance with ASME B36.10 and ASME B36.19 as applicable.
- 2.4 For reducing butt weld fittings having different wall thicknesses at each end, the greater wall thickness of the fitting shall be employed and inside bore at each end shall be matched with the specified inside diameter.

- 2.5 Beveled ends for all fittings shall conform to ASME B16.25. Contour of bevel shall be as follows:

Material	Wall Thickness	Weld Contour
Carbon steel (except low temperature carbon steel)	Upto 22 mm	Figure 2 Type A
	> 22 mm	Figure 3 Type A
Alloy steel, stainless steel and low temperature carbon steel	Upto 10 mm	Figure 4
	> 10 mm & upto 25 mm	Figure 5 Type A
	> 25 mm	Figure 6 Type A

2.6 Welded Fittings

- 2.6.1 All welded fittings shall be double welded. Inside weld projection shall not exceed 1.6 mm. Welds shall be ground smooth at least 25 mm from the ends.
- 2.6.2 For fittings made out of welded pipe, the welded pipe itself shall be double welded and shall be manufactured with the addition of filler metal.
- 2.6.3 Welded tees shall not be of fabricated (stub-in) type.
- 2.6.4 All welded fittings shall be normalized & all weld joints including parent material weld shall be 100% radiographed by X-ray on all welds made by fittings manufacturers & also on the parent materials.
- 2.6.5 Welded pipes employed for manufacture of fittings shall be made by automatic welding only.
- 2.6.6 Specified heat treatment for carbon steel & alloy steel fittings shall be carried out again after weld repairs.
- 2.6.7 Irrespective of the material code requirement, all welded fittings indicated in specification as "Cryo" & "LT" shall meet impact test requirements of ASME B31.3. The impact test temperature shall be (-) 196⁰C & (-) 45⁰C for stainless steel & carbon steel respectively unless specifically mentioned otherwise in the SPECIFICATION.

2.7 Stainless Steel Fittings

- 2.7.1 All stainless steel fittings shall be supplied in solution heat-treated condition.
- 2.7.2 Solution annealing for stainless steel fittings shall be carried out again after weld repairs.
- 2.7.3 For all stainless steel fittings Inter Granular Corrosion (IGC) test shall have to be conducted as per the following:

ASTM A262 Practice “B” with acceptance criteria of “60” mils/year (max.)”.

Or

ASTM A262 Practice “E” with acceptance criteria of “no cracks as observed from 20X magnification” & “microscopic structure to be observed from 250X magnification”.

2.7.4 When specifically asked for in specification for high temperature application of some grades of austenitic stainless steel (e.g. SS309, 310, 316, 316H etc.) ASTM A262 Practice “C” with acceptance criteria of “15 mils/year” shall have to be conducted.

2.7.5 For the IGC test as described in clauses as above, two sets of samples shall be drawn from each solution treatment lot, one set corresponding to the highest carbon content and other set to the highest fitting thickness. When testing is conducted as per ASTM A262 Practice “E”, photograph of microscopic structure shall be submitted for record.

2.8 Thickness/ schedule lower or higher than specified for the finished product shall not be accepted.

For manufacturing of elbows from pipes, same size of pipe as that of elbow shall be used and the normal wall thickness of the starting pipes shall have positive tolerance only. However, where the manufacturer has an established automatic/ semi-automatic process for the manufacturer of elbows, the starting pipe may be permitted to be of lower size with higher schedule as required. Starting pipe of higher size than that of the elbow shall not be permitted.

2.9 The gasket contact surfaces of stub ends shall be flat with face finish specified in the requisition. Interpretation on the specified face finish is as follows:

125 AARH : Serrations with 125 to 250 μ in AARH

2.10 Seamless stub ends shall not have any welds on the body. Stub ends shall be of long pattern type unless specified otherwise in the specification.

2.11 Galvanized fittings shall be coated with zinc by hot dip process conforming to ASTM A153 / IS4736.

2.12 Threaded ends shall have NPT taper threads in accordance with ASME/ ANSI B1.20.1 upto 1.5” NB & IS 554 from 2” to 6” NB.

2.13 Unless and otherwise specified in the specification, all socket welded and screwed fittings shall be in accordance with ASME B16.11 and ANSI B1.20.1 to the extent covered in the specification except for unions which shall be in accordance with MSS-SP-83.

- 2.14 Special fittings like nipple, elbow, latrolet, bosset, sweep-o-let etc. which are not covered in ASME, MSS-SP standards shall be as per manufacturer's std. Contour of these fittings shall meet the requirements of ASME B31.3. Manufacturer shall submit drawings/catalogues of these items along with the offer.
- 2.15 Length of all long half couplings shall be 100 mm unless otherwise specified in the SPECIFICATION.
- 2.16 All seamless employed for manufacturing of fittings shall be required to have undergone hydrotest to ATSM A530. Welded pipes employed for manufacture of fittings shall be tested as given below:

Welded pipe employed for manufacture of welded fittings	Test criteria
ASTM A671 Gr. C65, 70 (Cl.32) ASTM A 672 Gr. C60, 65, 70 (Cl. 12, 22) ASTM A671 Gr. CF 60, 65, 70, 66 (Cl. 32) ASTM A 691 Gr. ½ Cr, 1 Cr, 1¼ Cr, 2¼ Cr, 5 Cr, 9 Cr (Cl. 42)	P = 2ST/ D S = 90% of SMYS T = Nom. Wall Thickness D = O.D. of Pipe
API 5L ASTM A358 TP 304, 304L, 304H, 318, 318L, 318H, 321, 347 (Cl. 1,3,4)	P = 2ST/D S = 85% of SMYS T = Nom. Wall Thickness D = O.D. of pipes
ASTM B 725	ASTM B 725
ASTM B 517	ASTM B 517
ASTM B 514	ASTM B 514

- 2.17 The bevel ends of all butt weld fittings shall undergo 100% MP/ DP test.
- 2.18 Abbreviations for ends of swages and nipples shall be as follows:
- PBE : Plain Both Ends
TBE : Threaded Both Ends
TOE : Threaded One End
TSE : Threaded Small End
TLE : Threaded Large End
- 2.19 All types of SS321, SS347 or SS348 fittings shall be in stabilized heat treated condition. Stabilizing heat treatment shall be carried out subsequent to normal solution annealing. Soaking temperature and holding time for stabilizing heat treatment shall be 900°C and 4 hours respectively.

3.0 Hydrogen Service Fittings:

- a) All carbon steel fittings having wall thickness 9.53 mm (0.375") and above shall be normalized. Cold drawn fittings shall be normalized after the final cold draw pass for all thicknesses. In addition, fittings made from forgings shall have Carbon–0.35% max. and Silicon-0.35% max. The normalizing heat treatment shall be a separate heating operation and not a part of the hot forming operation.
 - b) All alloy steel (Cr-Mo) fittings shall be normalized and tempered. The normalizing and tempering shall be a separate heating operation and not a part of the hot forming operation. The maximum room temperature tensile strength shall be 100,000 psi.
 - c) For carbon steel fittings, hardness of weld and HAZ shall be 200 BHN (max.) for alloy steel fittings, hardness of weld and HAZ shall be 225 BHN (max.).
 - d) For all austenitic stainless steels, the weld deposit shall be checked for ferrite content. A Ferrite No. (FN) not less than 3% and not more than 10% is required to avoid sigma phase embrittlement during heat treatment. FN shall be determined by Ferritescope prior to post weld heat treatment.
 - e) For all carbon steel and alloy steel fittings with wall thickness over 19 mm, Charpy-V Notch impact testing shall be carried out in accordance with paragraph UG-84 of ASME Section VIII, Div.-I for weld metal and base metal from the thickest item per heat of material and per heat treating batch. Impact test specimen shall be in complete heat treated condition and accordance with ASTM A370. Impact energies at 0°C shall average greater than 27J (20 ft-lb) per set of three specimens, with a minimum of 19J (15 ft-lb).
- 3.1 For all welded alloy steel fittings with mandatory requirements of heat treatment and radiography, radiography shall be performed after heat treatment.
- 3.2 All 1Cr-0.5Mo & 1.25Cr-0.5Mo fittings shall be normalized and tempered. All 2.25Cr-1Mo, 5Cr-0.5Mo & 9Cr-1Mo welded fittings shall be normalized and tempered.
- 3.3 Fitting material as per ASTM A234 Gr.WP5/WP9, wherever specified, shall be as per Clause-1, unless otherwise specified.
- 3.4 Materials designated, as structural steel grades like IS 2062, SA 36 etc. or similar specification are not permitted for manufacture of fittings.

4.0 NACE CS FITTINGS

4.1 Fittings under “NACE” category shall meet the requirement of MR-01-75 and the special requirements as per purchase requisition specification.

5.0 IBR FITTINGS

5.1 Fittings under the purview of “IBR” (Indian Boiler Regulations) shall be accompanied with original IBR certificate in Form III-C duly approved and countersigned by IBR authority/ local authority/ manufacturer empowered by Central Boiler Board of India and issue inspection certificate. Photocopy of the original certificate duly attested by the local boiler inspector where the supplier is located is the minimum requirement for acceptance.

5.2 For materials 1¼Cr – ½Mo (ASTM A234 Gr.WP11 & ASTM A234 Gr.WP11W) & 2¼ Cr-1Mo (ASTM A234 Gr.WP22 & ASTM A234 Gr. WP22W), where fittings are manufactured from pipe, Form III-C approved by IBR shall include the tabulation of E_t, S_c & S_r values for the entire temperature range given below. E_t, S_c & S_r values shall be such that throughout the temperature range.

$$\begin{array}{l} E_t/1.5 \\ S_r/1.5 \\ S_c \end{array} \geq \left| \begin{array}{l} \\ \\ \end{array} \right. S_A$$

S_A : Allowable stress at the working metal temperature (as per latest addition of ASME B-31.3).

E_t : Yield point (0.2% proof stress at the working metal temperature)

S_c : The average stress to produce elongation of 1% (creep) in 100000 hrs at the working metal temperature.

S_r : The average stress to produce rupture in 100000 hrs at the working metal temperature and in no case more than 1.33 times the lowest stress to produce rupture at this temperature.

Temp (F) Material	S _A (psi)											
	500	600	650	700	750	800	850	900	950	1000	1050	1100
A 234 Gr. WP11/ A 234 Gr. WP 11W	21700	20900	20500	20100	19700	19200	18700	13700	9300	6300	4200	2800
A 234 Gr WP 22/ A 234 Gr. WP 22 W	17900	17900	17900	17900	17900	17800	14500	12800	10800	7800	5100	3200

Note: S_A values shall be as per the latest edition prevailing.

5.3 For carbon steel fittings described "IBR" chemical composition shall conform to the following:

Carbon (max.) : 0.25%
Others (S, P, Mn) : As prescribed in IBR regulations

The above composition is not valid for non-IBR fittings.

6.0 INSPECTION REQUIREMENT FOR FITTINGS

6.1 All fittings shall be made from seamless pipes unless otherwise specified in purchase order.

6.2 The seamless pipes shall be verified with certificate for chemical and physical properties, hydrotest requirement (as stipulated in technical spec) issued by the manufacturer's quality control section and will be endorsed by Third Party Inspection as identification of material.

6.3 All fittings shall be supplied in heat-treated condition as per ASTM Standard mentioned in Purchase Order.

6.4 Visual inspection and dimensional checking of 100% fittings as per relevant ANSI, ASTM Standards, shall be carried out by Third Party Inspection (This includes thickness checking of 100% fittings).

6.5 Manufacturer shall provide the following reports as per relevant standards mentioned in the technical specifications & fittings purchase order.

- a) Chemical analysis reports.
- b) Tensile test results.
- c) Type of heat treatment.
- d) Hardness Test results.
- e) Impact test reports, radiography report, IGC test report, hydrotest (if required in the specified standard).

6.6 All fittings shall be stamped as per specified ASTM standard specified in purchase order.

7.0 SCOPE OF INSPECTION FOR THIRD PARTY INSPECTION AGENCY

7.1 This scope of inspection shall be read with item description, codes stipulated in purchase requisition, requirement of test and inspection as per this technical specification/ note.

7.2 Tests to be witnessed:

- i. Testing for physical properties for dia. 2" and above.
- ii. Visual inspection : 100%
- iii. Dimensional check : 100%
- iv. Thickness check : 100%
- v. Impact test, if applicable
- vi. IGC test, if applicable
- vii. Hydrostatic test (if specifically mentioned)

7.3 Review of documents:

- i. Mill T.C. of raw materials
- ii. Materials identification reports
- iii. Radiographs
- iv. Heat Treatment Charts
- v. Manufacturers test certificates
- vi. Chemical analysis reports
- vii. Tensile test results
- viii. Hardness test results

7.4 Third party inspection shall issue a release note on their letterhead giving correlation-marking details. The third party inspection shall contain the information on tests witnessed, documents reviewed, observations/ remarks, identifications, order status and date(s) of inspection. All the documents along with original certificate & release note shall be furnished with supplies.

8.0 MARKING AND DESPATCH

8.1 Each fitting shall be legibly and conspicuously stamped in accordance with MSS-SP-25 along with special condition like "IBR", "Cryo", "NACE" and "H₂" etc.

8.2 Steel die marking with round bottom punch may be permitted on body of butt weld CS and lower alloy steel fittings, but for SS & higher alloy steel fittings, the same should be marked by electro-etching only.

8.3 Paint or ink for marking shall not contain any harmful metals or metal salts such as Zinc, Lead or Copper which causes corrosive attack on heating.

8.4 Fittings shall be dry, clean and free of moisture, dirt and loose foreign materials of any kind.

8.5 Fittings shall be protected from rust, corrosion and mechanical damage during transportation, shipment and storage.

- 8.6 Rust preventive shall be applied. These when used on machined surfaces to be welded shall be easily removable with a petroleum solvent and the same shall not be harmful to welding.
- 8.7 Fittings under “IBR”, “Cryo”, “NACE” and “H₂” shall be painted in red, light purple, canary yellow and sea green stripes respectively for easy identification. Width of stripe shall be 25mm.
- 8.8 Each end of fitting shall be protected with a wood, metal or plastic cover/ sponge.
- 8.9 Each size of fitting shall be supplied in separate packaging marked with the purchase order number, item code number, material specification, size and schedule/ thickness/ rating. For small quantities, fittings of different sizes may be packed in separate packings size-wise and these packings may be packed in a bigger package/ container clearly identifying the contents.
- 8.10 All alloy materials tested by PMI shall be identified using either of the following methods by indicating “PMI OK”
- a) Bar Code/ Hologram Sticker
 - b) A low stress stamp marking
 - c) Or by any other method

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ADVISORY

RECOMMENDED GUIDELINES FOR COLOR CODING OF STORED PIPING MATERIALS

The intent for the advisory is to provide a system for easy identification of piping materials. Colour coding in piping & piping materials will provide an essential information for identifying various grades of piping metallurgy, thus avoiding mixing of these materials of different metallurgy having similar physical appearance. So pipe colour coding will help in identifying the Piping components shipped individually to the construction site / Refinery stores. Considering the same, at procurement stage, Refineries are encouraged to adopt the following for colour coding of Pipes & Piping materials to simplify identification of these materials during storage, issue or while returning back to inventory.

The general guidelines of identification by colour coding are enclosed herewith.

GM (M&I) :

11/5/2023

CGM (M&I) :

11/5/2023

ED (M&I) :

11/5/23

01/05/23
Soham Debdas
DGM (M&I)

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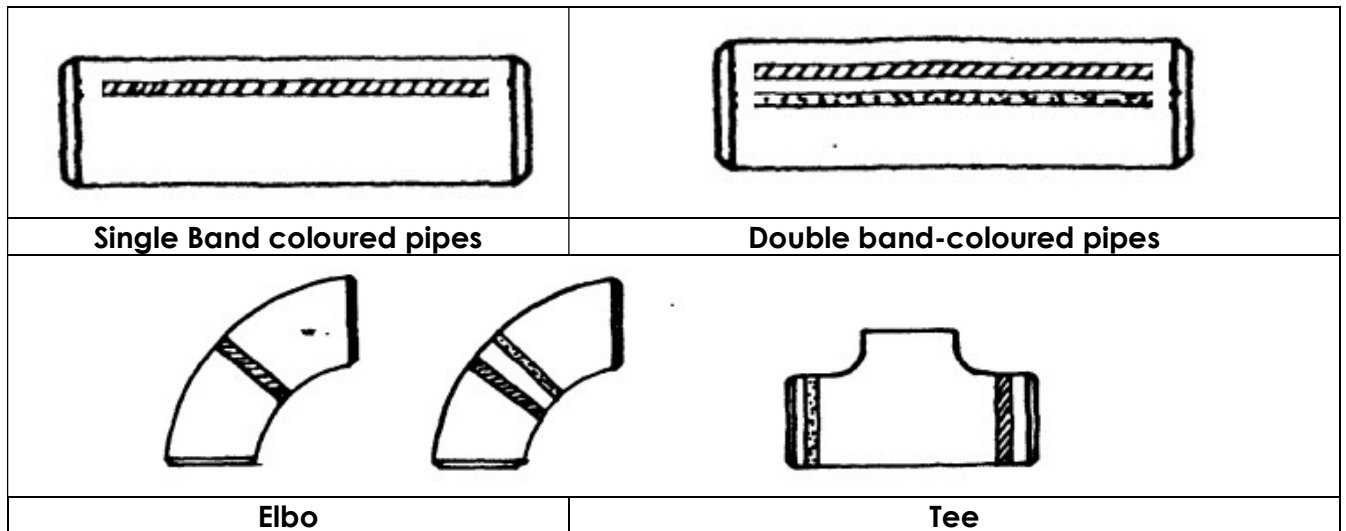
GENERAL GUIDELINES OF IDENTIFICATION BY COLOUR CODING

- Pipes & pipe materials shall be painted with one colour or a combination of colours, as specified; whenever combination of two or more colours are required / specified, materials shall be painted in parallel colour bands as close to each other as possible
- Colour identification is not required on galvanized material and non-ferrous material such as Copper, Aluminium, lead etc. because they are easily distinguished by their specific colour & character.
- Colour identification is not required on Austenitic Steel.
- Other items like bellows, strainer, steam traps, valves do not require colour identifications as these items are tagged with their identification.
- Width of the colour band :

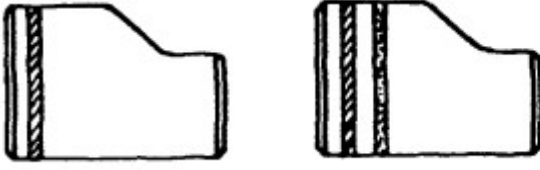


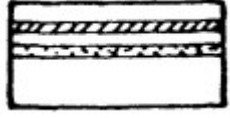
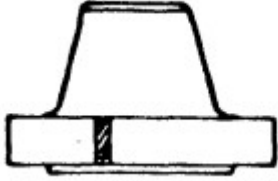

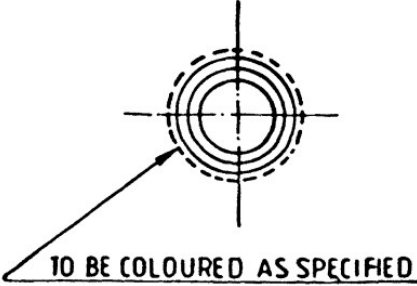
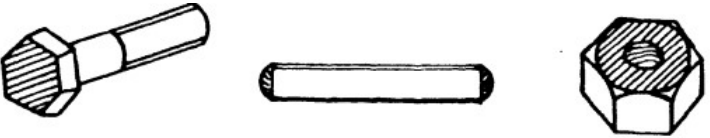
Less than 3 IN size	Min. 12mm
Greater than or equal to 3 IN size	25 mm

- The paint shall not cover welding surfaces and end of the materials which are to be welded.
- Studs / Bolts and Nuts shall be painted only.
- Identification colour on gaskets shall be painted on the peripheral face of each gasket.
- Paints containing chlorine, chlorides, sulphur, lead, zinc or any contents detrimental to materials are not acceptable. The bidder shall satisfy the same & undertaking has to be given during bid submission.

Location of marking :



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Reducer	Stub
	
Cap	Coupling
	
Flanges	
 <p style="text-align: center;">TO BE COLOURED AS SPECIFIED</p>	
Gasket	Stud, Nut, Bolt

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COLOUR CODE – Pipe & Pipe Fittings

SN	Pipe material (Common Designation)	Fittings	Flange / Blind flange	Recommended Colour Shade	RAL Number (RAL)
1.0	LTCS (A333, Gr 6)	A-420 WPL 6 & A-420 WPL6W		Leaf Brown	RAL 8003
2.0	CS (A106, Gr B)			Deep Orange	RAL 2011
3.0	CS (A106, Gr B Normalized)	A-234 Gr WPB(N) & A -234 Gr WPBW (N)		Deep Orange & Sea Green	RAL 2011 & RAL 6018
4.0	API 5L Gr B (Seamless & EFSW)			None	-
5.0	IS 1239/ IS 3589 Gr 410			Dove Grey	RAL 7005
6.0	IS 3589 Gr 330			Dove Grey & Navy Blue	RAL 7005 & RAL 5013
7.0	A 335 Gr P1 (C-Mo)	A-234 WP1 & A234 WP1W	A 182 F1	Chocolate	RAL 8017
8.0	A 335 Gr P11 (1 ¼ Cr- ½ Mo), A 691 Gr 1 ¼ Cr Cl 42 (EFW)	A-234 WP11 & A-234 WP11W	A 182 F11	Traffic Yellow	RAL 1023
9.0	A 335 Gr P12 (1 Cr – ½ Mo)	A-234 WP12 & A-234 WP12W	A 182 F12	Sky Blue	RAL 5021
10.0	A335 Gr P22 (2 ¼ Cr – 1 Mo), A 691 Gr 2 ¼ , Cl 42 (EFW)	A-234 WP22 & A-234 WP22W	A 182 F22	Aircraft Yellow	RAL 1026
11.0	A335 Gr P5 (5 Cr – ½ Mo)	A-234 WP5 & A-234 WP5W	A 182 F5	Satin Blue	RAL 5012
12.0	A335 Gr P9 (9 Cr – 1 Mo)	A-234 WP9 & A-234 WP9W	A 182 F9	Verdigris Green	RAL 6021
13.0	A335 Gr P91	A-234 WP91 & A-234	A 182 F91	Pink	RAL 3014

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SN	Pipe material (Common Designation)	Fittings	Flange / Blind flange	Recommended Colour Shade	RAL Number (RAL)
		WP91W			
14.0	Stainless Steel			None	-
15.0	-	A-234 Gr WPB & A-234 Gr WPBW	A-105, A- 182	None	-
16.0	IBR			Signal Red	3001

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COLOUR CODE – Stud, Nuts & Bolts

SN	Designation	Recommended Colour Shade	RAL Number (RAL)
1.0	Bolt - A 193 Gr B7	Melon yellow	RAL 1028
2.0	Nut - A 194 GR 2 H	Melon yellow	RAL 1028
3.0	Bolt - A 307 GR B	Indian Brown	RAL 8016
4.0	Nut - A 307 GR B	Indian Brown	RAL 8016
5.0	Bolt - A 193 GR B 16	Traffic Yellow	RAL 1023
6.0	Nut - A 194 GR 4	Traffic Yellow	RAL 1023
7.0	Bolt - A 320 GR L 7	Chocolate	RAL 8017
8.0	Bolt – A 320 Gr B8	Pale brown	RAL 8025
9.0	Nut – A 194 gr 8	Pale brown	RAL 8025

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COLOUR CODE – Gaskets

SN	Designation	Recommended Colour Shade	RAL Number (RAL)
1.0	Compressed Fibre (Ring & Full Face) - BS753I GR.X (FULL FACE)	Dove Grey	RAL 7005
2.0	Compressed Fibre (Ring & Full Face) - BS753I GR.X (RING)	-	-
3.0	Spiral Wound gasket – SS 304 SPR WND + Grafoil Filler	Satin Blue	RAL 5012
4.0	Spiral Wound gasket – SS 304 H + Grafoil Filler	Salmon Pink	RAL 3012
5.0	Spiral Wound gasket – SS 304 + Grafoil Filler	Pale brown	RAL 8025
6.0	Spiral Wound gasket – SS 304 + Teflon Filler	Indian Brown	RAL 8016
7.0	Spiral Wound gasket – SS 304 L SPR WND + Grafoil Filler	Leaf Brown	RAL 8003
8.0	Spiral Wound gasket – SS 316 SPRWND + Grafoil Filler	Deep Orange	RAL 2011
9.0	Spiral Wound gasket – SS 316 L SPR. WND + Grafoil Filler	Traffic Yellow	RAL 1023
10.0	Spiral Wound gasket – SS 316 H SPR. WND + Grafoil Filler	Canary Yellow	RAL 1018
11.0	Spiral Wound gasket – Teflon Jacketed SPR. WND	Dark Violet	RAL 4006
12.0	Spiral Wound gasket – SS321 Spr WND + Grafoil filler	Sea Green	RAL 6018
13.0	Spiral Wound gasket – SS347 Spr WND + Grafoil Filler	Sky Blue	RAL 5021
14.0	Oct. Ring Gasket – 5 Cr, 1/2 Mo (Max. 120 BHN)	Fir Green	RAL 6009
15.0	Soft Iron (Max. 90 BHN)	Dove Grey	RAL 7005