

				Prices To Be Filled By The Contractor	
Item No.	Description	Unit	Quantity	Currency :- <input type="checkbox"/> \$ <input type="checkbox"/> £ <input type="checkbox"/> €.....	
				Unit Cost	Total Cost
1.	20X2.1X11208X4880X461MM.	EA	16		
2.	20X2.1X11127X4880X435MM.	EA	15		
3.	20X2.1X11045X4880X409MM.	EA	15		
4.	20X2.1X10963X4880X383MM.	EA	15		
5.	20X2.1X10882X4880X357MM.	EA	15		
6.	20X2.1X10800X4880X331MM.	EA	52		
7.	20X2.1X10718X4880X305MM.	EA	52		
8.	20X2.1X10637X4880X279MM.	EA	15		
9.	20X2.1X10555X4880X253MM.	EA	15		
10.	20X2.1X10473X4880X227MM.	EA	15		
11.	20X2.1X10391X4880X201MM.	EA	15		
12.	20X2.1X10310X4880X175MM.	EA	15		
13.	20X2.1X10228X4880X149MM.	EA	15		
14.	20X2.1X10150X4880X124MM.	EA	15		
15.	20X2.1X 9864X4880X 33MM.	EA	42		

Delivery Instructions

Branch/Plant 2002  
Order Date 27/07/2021  
Request Date 06/06/2022  
Freight Handling .

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General Description 1 010178 U-BEND,SEAMLESS,SINGLE GAGE TUBES,MADE OF ARSENIC INHIBITED ADMIRALTY BRASS, INTENDED FOR USE IN REFINERY CONDENSERS AND COOLERS ACCORDING TO THE FOLLOWING:

1- SPECIFICATION :-  
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ASTM B395M-88,SPECIFICATION FOR U-BEND SEAMLESS COPPER ALLOY HEAT EXCHANGER AND CONDENSER TUBES .

2- MATERIAL :-  
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ARSENIC INHIBITED ADMIRALTY BRASS, COPPER ALLOY UNS NO. C44300 .

3- DIMENSIONS :-  
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3.1- DEVELOPED LENGHT,WALL THICK., CENTERLINE BEND RADIUS, LEG LENGTH OF U-TUBE SHALL BE AS TABULATED HEREINAFTER .

3.2- THE MAXIMUM THICKNESS AT THE STRAIGHT PORTION OF TUBE SHALL NOT EXCEED THE CALCULATED VALUE OBTAINED FROM ADDITION OF TWICE THE TOLERANCE IN TABLE 7 IN RELEVANT SPECIFICATION TO THE MINIMUM TUBE WALL THICK.

3.3- MINIMUM THICKNESS AT APEX OF U-BEND SECTION SHALL NOT BE LESS THAN THE CALCULATED VALUE ADOPTING THE EQUATION STATED IN PARAGRAPH 14.2.2 OF RELEVANT SPECIFICATION .

(NOTE : FABRICATOR OF U-BEND TUBES SHALL ASSURE HIMSELF THAT

No. Number Number Number Quantity Unit Unit Price Currency Code Order No Type LineNo

MINIMUM THICKNESS AT APEX OF U-BEND OF ALL TUBES AFTER BENDING SHALL NOT BE LESS THAN MINIMUM CALCULATED VALUE) .

4- END USE AND CONDITION OF SUPPLY :-

- 4.1- TUBES PURCHASED ACCORDING TO THIS SPECIFICATION ARE INTENDED FOR USE IN REFINERY CONDENSERS. LEGS OF U-BEND TUBES WILL BE INSERTED THROUGH CLOSE-FITTING HOLES IN BAFFLES AND SUPPORT PLATES SPACED ALONG TUBE LEG LENGTH.TUBE ENDS ARE INTENDED TO BE INSERTED INTO VERY CLOSE - FITTING HOLES IN TUBESHEETS AND EXPANDED .
- 4.2- ENDS OF U-BEND TUBE SHALL BE SQUARE CUT AND PREPARED FOR EXPANSION INTO TUBE SHEET HOLES (AS EXPLAINED IN PARAGRAPH 4.1)
- 4.3- FINISHED U-BEND TUBES SHALL BE SMOOTH AND CLEAN,BENT PORTION B SHALL BE SUBSTANTIALLY UNIFORM IN CURVATURE .

5- HEAT TREATMENT :-

- 5.1- SINGLE GAGE STRAIGHT TUBING READY FOR U-BENDING SHALL BE FURNISHED IN THE ANNEALED(061) TEMPER CONDITION .
- 5.2- POST BENDING STRESS RELIEF ANNEALING IS REQUIRED .
- 5.3- ANNEALING AND POST BENDING ANNEALING SHALL BE DONE TO SATISFY THE PROCEDURE DESCRIPED IN RELEVANT ASTM-SPECIFICATION.

6- VARIATIONS IN DIMENSIONS :-

PERMISSIBLE VARIATIONS SHALL BE AS

No.	Number	Number	Number	Quantity	Unit	Unit Price	Currency Code	Order No	Type	LineNo
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FOLLOWING :-

- 6.1-U-TUBE LEG PLUS 3.2MM.,  
LENGTH . : MINUS ZERO .
- 6.2-U-TUBE LEG PLUS 3.2MM.,  
LENGTH DIFFERENCE: MINUS ZERO .
- 6.3-VARIATION FROM  
PLAN OF BEND : 1.5MM. (MAX) .
- 6.4-LEG SPACING : PLUS 1.6MM.,  
MINUS ZERO .
- 6.5-OUTSIDE DIAMETER PLUS 0.1MM.,  
OF STRAIGHT TUBE : MINUS 0.1MM.
- 6.6-OUTSIDE DIAMETER  
OF TUBE AT U-BENT  
SECTION : MAX 2MM.
- 6.7-WALL THICKNESS AT PLUS 0.26,  
STRAIGHT SECTION : MINUS ZERO .
- 6.8-SQUARENESS OF  
CUT AT TUBE END : 0.016MM. / MM.

7- PACKAGING :-

- 7.1- TUBES SHALL BE ADEQUATELY  
PACKAGED IN WOODEN BOXES  
SECURED WITH TENSION TIES TO  
AFFORD PROTECTION FROM NORMAL  
HAZARD OF TRANSPORTATION .
- 7.2- TUBE ENDS SHALL BE PROTECTED  
AGAINST CORROSION DURING  
SHIPMENT AND OUTDOOR STORAGE .
- 7.3- U-BEND TUBES SHALL BE ARRANGED  
IN A MANNER THAT SMALLER RADII  
BENDS MAY BE REMOVED WITHOUT  
DISTURBING LARGER RADII BEND  
TUBES .

8- MARKING :-

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- EACH PACKAGE SHALL BE LEGIBLY MARKED  
AT A LOCATION VISIBLE FROM OUTSIDE  
AND SHALL SHOW THE FOLLOWING :-
- 8.1- MANUFACTURER'S NAME / TRADE  
DESIGNATION .
  - 8.2- PURCHASE ORDER NUMBER .

No.	Number	Number	Number	Quantity	Unit	Unit Price	Currency Code	Order No	Type	LineNo
		8.3-	SIZE OF TUBE / QUANTITY .							
		8.4-	ALLOY DESIGNATION AND TEMPER .							
		9-	CHEMICAL COMPOSITION :- ----- THE PERCENT WEIGHT CONTENT OF THE FOLLOWING ELEMENTS SHALL BE REPORTED (Cu,Sn,Pb,Fe,Zn. AND As) .							
		10-	MECHANICAL PROPERTIES :- ----- MATERIAL SHALL HAVE TENSILE PROPERTIES AS PRESCRIBED IN RELEVANT SPECIFICATION .							
		11-	TEST REPORTS AND CERTIFICATES :- ----- 11.1- MILL CERTIFICATE AND TEST REPORTS ARE REQUIRED AND SHALL INCLUDE RESULTS OF THE FOLLOWING TESTS AS CALLED FOR IN RELEVANT SPECIFICATION : 11.1.1-CHEMICAL COMPOSITION . 11.1.2-MECHANICAL PROPERTIES. 11.1.3-TEMPER/HEAT TREATMENT DETAILS . 11.1.4-MICROSCOPIC EXAMINATION .PHOTOGRAPHS SHALL BE PROVIDED-UNIFORM AND COMPLETE RECRYSTALIZA- TION IS REQUIRED . 11.1.5-EXPANSION TEST . 11.1.6-FLATTENING TEST . 11.1.7-MERCUROUS NITRATE TEST. 11.1.8-EDDY CURRENT TEST . 11.2- IN ADDITION TO MILL CERTIFICATES,AND REGARDING TO MICROSCOPIC EXAMINATION AND MERCUROUS NITRATE TEST, SEPARATE TEST CERTIFICATE FROM AN INDEPENDENT AUTHORIZED 3RD PARTY INSPECTION AUTHORITY IS REQUIRED .							

Line No.	VOCAB Number	Description	Part Number	Drawing Number	Ordered Quantity	Supplier Offer Unit	Supplier Offer Unit Price	Supplier Offer Currency Code	Original Order No	Original Type	Original LineNo
		TESTS SHALL BE CONDUCTED AFTER THE POST BENDING HEAT TREATMENT ACCORDING TO ASTM TEST PROCEDURE AT A SPECIALIZED TEST LABORATORY.THE POST BENDING HEAT TREATMENT SHALL NOT HAVE AN ADVERSE EFFECT ON TUBES .									
		12- DATA REQUIRED DURING OFFERING STAGE :-									
		12.1- DATA REQUIRED FROM TUBE MANUF. PRODUCT SPECIFICATION SHEET AND TECHNICAL BROCHURES TO INCLUDE FULL DETAILS OF THE FOLLOWING SHALL BE ATTACHED WITH THE OFFERS :-									
		12.1.1-CHEMICAL COMPOSITION .									
		12.1.2-MECHANICAL PROPERTIES.									
		12.1.3-CORROSION RESISTANCE .									
		12.1.4-REFERENCE LIST OF CUSTOMERS .									
		12.1.5-MANUFACTURER'S CAPABILITIES .									
		12.1.6-ACCREDITATION CERTIFICATES IN THE POSSESSION OF THE MANUFACTURER .									
		12.1.7-TEST PROCEDURES TOGETHER WITH A COPY OF A TYPICAL TEST REPORT OF THE FOLLOWING :-									
		12.1.7.1-EDDY CURRENT TEST .									
		12.1.7.2-MERCUROUS NITRATE TEST .									
		12.1.7.3-MICROSCOPIC EXAMINATION .									
		12.2- DATA REQUIRED FROM FABRICATOR OF U-BEND TUBE : PRODUCT SPECIFICATION SHEET AND TECHNICAL BROCHURES TO NICLUDE FULL DETAILS OF THE FOLLOWING SHALL BE ATTACHED WITH THE									



Line No.	VOCAB Number	Description	Part Number	Drawing Number	Ordered Quantity	Supplier Offer Unit	Supplier Offer Unit Price	Supplier Offer Currency Code	Original Order No	Original Type	Original LineNo
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OFFERS :-  
 12.2.1-BENDING PROCEDURE AND FULL DETAILS OF POST-BENDING HEAT TREATMENT AS FOLLOWING :-  
 12.2.1.1-METHOD OF HEATING .  
 12.2.1.2-SHIELDING ATMOSPHERE (GAS) .  
 12.2.1.3-POST BENDING HEAT TREATMENT TEMPERATURE .HOLDING TIME.COOLING RATE,HEATING RATE .  
 12.2.1.4-GRAIN SIZE AFTER POST BEND HEAT-TREATMENT .  
 12.2.1.5-CORROSION RESISTANCE AFTER POST BENDING HEAT TREATMENT .  
 12.2.2-REFERENCE LIST OF CUSTOMERS .  
 12.2.3-MANUFACTURER'S CAPABILITIES .  
 12.2.4-ACCREDITION CERTIFICATES IN THE POSSESSION OF THE MANUFACTURER .  
 12.3- COST OF 3RD PARTY INSPECTION.

General Description 2 010157 DIMENSIONS :-  
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 (MAX.OD.)X(MIN.THK.AT STRAIGHT PORTION)  
 X (DEVELOPED LENGTH)X(MIN.LEG LENGTH) X  
 (MEAN CENTERLINE BEND RADIUS) .  
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1	010B751001	&&20X2.1X11208X4880X461MM.	U-BEND TUBES .	305 E 3A/B	16.000 EA	_____	_____	_____	21010713 OR		1
2	010B751002	&&20X2.1X11127X4880X435MM.	U-BEND TUBES .	305 E 3A/B	15.000 EA	_____	_____	_____	21010713 OR		2
3	010B751003	&&20X2.1X11045X4880X409MM.	U-BEND TUBES .	305 E 3A/B	15.000 EA	_____	_____	_____	21010713 OR		3

Line No.	VOCAB Number	Description	Part Number	Drawing Number	Ordered Quantity	Unit	Supplier Offer Unit Price	Supplier Offer Currency Code	Original Order No	Original Type	Orig LineNo
4	010B751004	&&20X2.1X10963X4880X383MM.	U-BEND TUBES .	305 E 3A/B	15.000	EA			21010713	OR	4
5	010B751005	&&20X2.1X10882X4880X357MM.	U-BEND TUBES .	305 E 3A/B	15.000	EA			21010713	OR	5
6	010B751006	&&20X2.1X10800X4880X331MM.	U-BEND TUBES .	305 E 3A/B	52.000	EA			21010713	OR	6
7	010B751007	&&20X2.1X10718X4880X305MM.	U-BEND TUBES .	305 E 3A/B	52.000	EA			21010713	OR	7
8	010B751009	&&20X2.1X10637X4880X279MM.	U-BEND TUBES .	305 E 3A/B	15.000	EA			21010713	OR	8
9	010B751011	&&20X2.1X10555X4880X253MM.	U-BEND TUBES .	305 E 3A/B	15.000	EA			21010713	OR	9
10	010B751014	&&20X2.1X10473X4880X227MM.	U-BEND TUBES .	305 E 3A/B	15.000	EA			21010713	OR	10
11	010B751017	&&20X2.1X10391X4880X201MM.	U-BEND TUBES .	305 E 3A/B	15.000	EA			21010713	OR	11
12	010B751020	&&20X2.1X10310X4880X175MM.	U-BEND TUBES .	305 E 3A/B	15.000	EA			21010713	OR	12
13	010B751023	&&20X2.1X10228X4880X149MM.	U-BEND TUBES .	305 E 3A/B	15.000	EA			21010713	OR	13
14	010B751026	&&20X2.1X10150X4880X124MM.	U-BEND TUBES .	308E5+305E3A/B	15.000	EA			21010713	OR	14
15	010B751037	&&20X2.1X 9864X4880X 33MM.	U-BEND TUBES .	308E5	42.000	EA			21010713	OR	15