



MANDEV TUBES

A LEADING MANUFACTURER OF VRF/VRV AIR CONDITIONING & MEDICAL GRADE COPPER TUBES

INSTALLATION GUIDE FOR COPPER TUBES - VRF/ VRV AIR CONDITIONING APPLICATIONS & MEDICAL GAS PIPELINE SYSTEMS

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Copper Tubes - Arteries for FLUID /
MEDICAL GAS Applications

*AN ISO 9001 : 2015, 14001 : 2015, 45001 : 2018, 7396-1 : 2016
Certified Company By URS , CE Mark And GREENPRO By WRG

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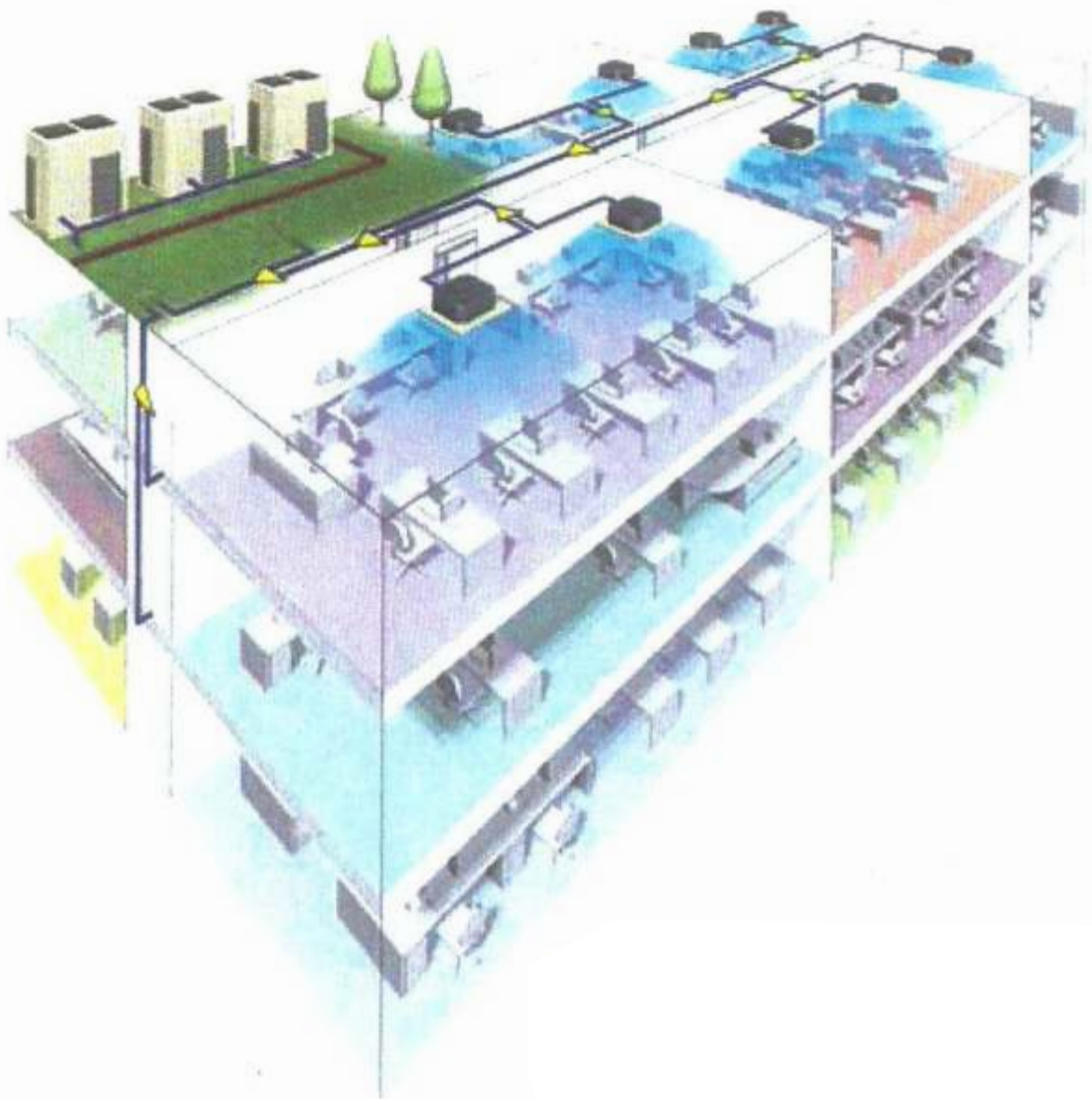


REFERENCE- **DAIPL - 08**

VRV X

Installation Guide

R-410A

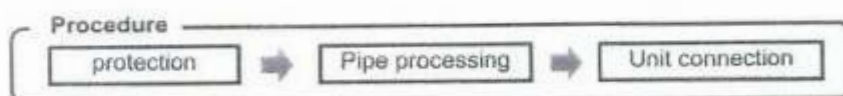
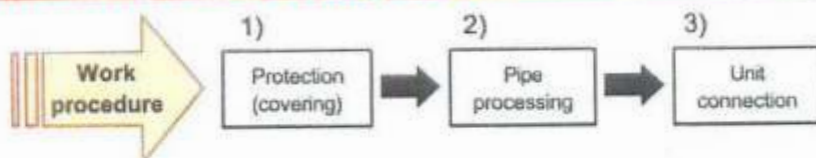


REFERENCE-
DAIKIN AIR CONDITIONING INDIA PVT. LTD.
Technical Support Department

INSTALLATION GUIDELINES FOR ACR / MEDICAL COPPER TUBES

2. Work by Process and Key Points




(4) Refrigerant piping work



-Working points-

• Adhere to the following three basic principles

[The 3 basic principles of refrigerant piping]

Dry	Clean	Tight
No water/moisture inside Do not let water/moisture in	No dust/contaminants inside Do not let dust/contaminants in	No leakage of refrigerant
		



1) Protection (covering)

Protection (covering) during storage and work involving refrigerant piping is the most important type of work in order to prevent water/moisture, contaminants or dust from entering into the piping.



★ If water/moisture, contaminants or dust enter into refrigerant piping, not only will it prevent AC from operating normally but it will cause malfunction and inconvenience for customer. Your utmost effort is required in preventing this from occurring.

1) Protection (covering)

Protection (covering) during storage and work involving refrigerant piping is the most important type of work in order to prevent water/moisture, contaminants or dust from entering into the piping.



★ If water/moisture, contaminants or dust enter into the refrigerant piping, not only will it prevent the air conditioner from operating normally but it will also cause a malfunction of the machine and significant inconvenience for the customer. Your utmost effort is required in preventing this from occurring.

◆ During storage

(1) Make sure to protect (cover) both pipe ends.



★ Do not use piping that has not been protected (covered).

(2) Do not lay refrigerant pipes directly onto a floor surface, but use an elevation of ≈ 300 mm from ground.



<Unprotected (uncovered) pipe ends>



<Protected (covered) pipe ends>



INSTALLATION GUIDELINES FOR ACR / MEDICAL COPPER TUBES

◆ **Pipe expansion...** Two pipes can be connected by expanding the end of 1 other pipe and brazing the connection.

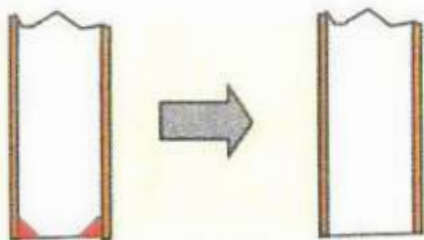
<Tools>



Expander

<Work procedure>

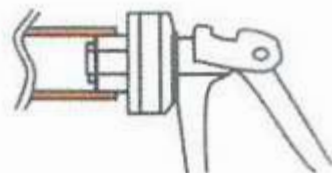
(1) Remove the burrs on the cut surface with a reamer or scraper.



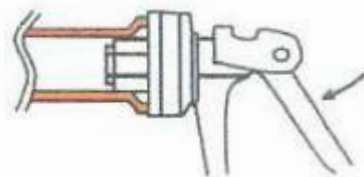
★ Note that excessive deburring can thin the walls of the pipe and cause vertical (lengthwise) cracking when expanding.



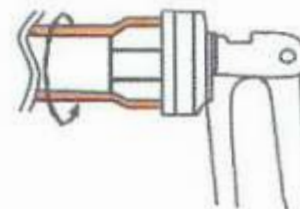
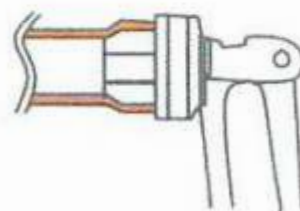
(2) Slightly expand the tip of the head.



(3) Insert the other pipe fully into the tip portion of the head, close the lever and expand the pipe.



(4) This may leave vertical scratches on the inner surface of the pipe so rotate the pipe to remove them.



INSTALLATION GUIDELINES FOR ACR / MEDICAL COPPER TUBES



Brazing jig



- It is even more effective to open up a small hole in the tape to release the nitrogen after covering the end of the pipe with tape or the like.
- Use of the tapered nozzle results in efficient replacement.

(2) Adjust the nitrogen gas pressure to 0.02 (MPaG) 2.9 PSIG/kgcm² or so.



- ★ If the nitrogen pressure is too high, it may cause the brazing filler metal (solder) not to reach completely around the pipe or pinholes to develop in it. Make sure that the pressure is not excessively high.
- ★ Use of nitrogen with a purity of at least 99.99% is recommended. Be sure to note that use of a lesser purity nitrogen may likely result in oxide film formation.



The effects of nitrogen replacement



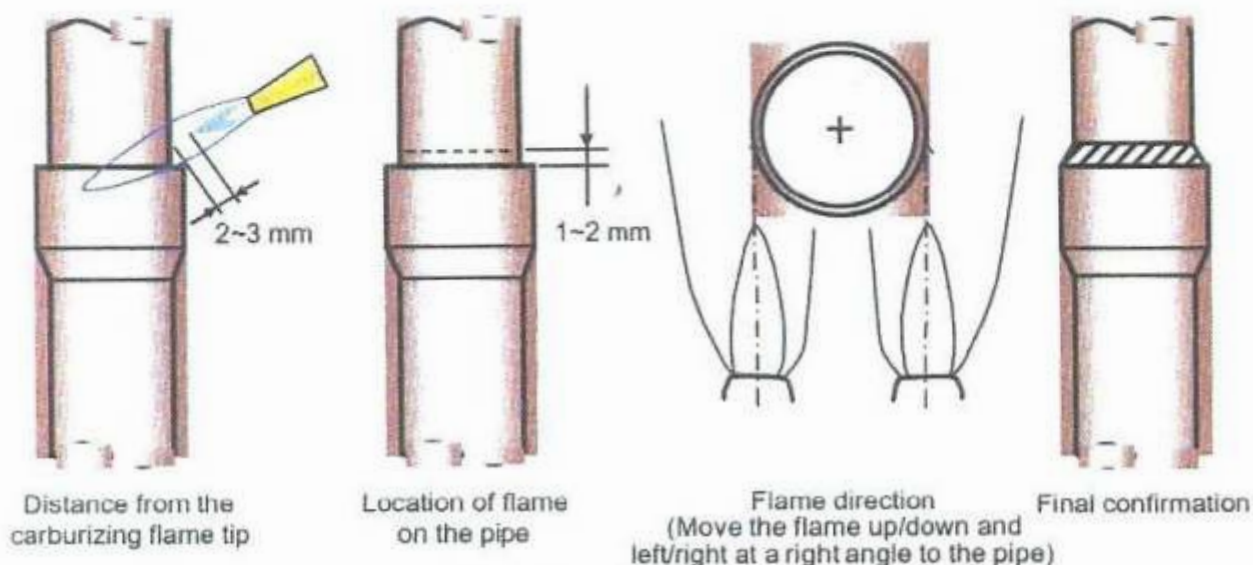
No nitrogen replacement
The inner surface of the pipe has blackened
due to the oxide film.



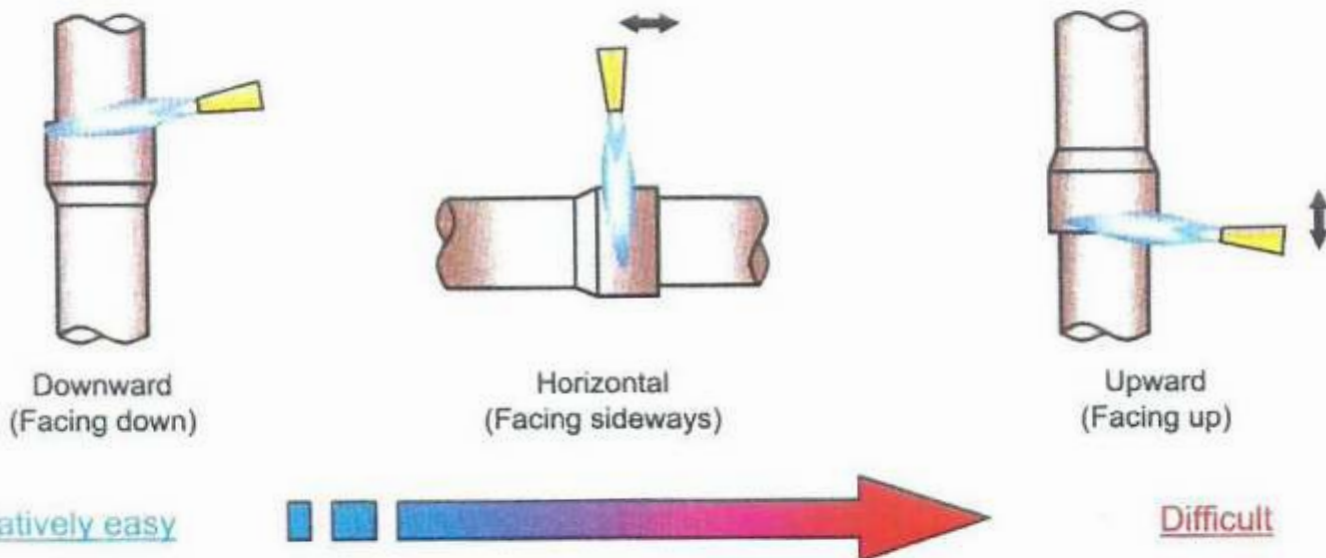
Nitrogen replacement
The inner surface of the piping is clean.

INSTALLATION GUIDELINES FOR ACR / MEDICAL COPPER TUBES

Point 5: Confirm visually. (Final confirmation of the distance from the carburizing flame tip, Location of flame on the pipe and flame direction)



- Do not turn off the nitrogen until the pipe is completely cooled down. If the nitrogen gas is stopped before the pipe has sufficiently been cooled down, it will result in the development of an oxide film on the inner surface of the pipe.

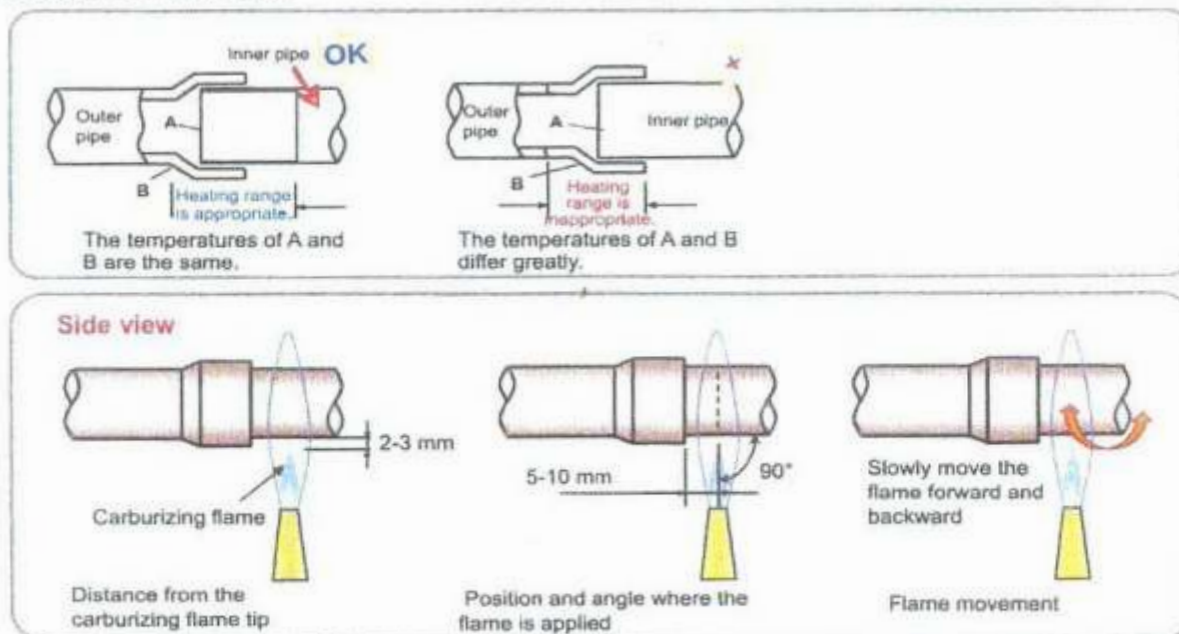


It is relatively easy to distribute the brazing filler metal when the pipe is facing down or sideways. But, if the pipe is facing up, it will be difficult to distribute the filler metal properly and this can result in a refrigerant leak. Therefore, make efforts to perform the brazing with the pipe facing down or sideways.

INSTALLATION GUIDELINES FOR ACR / MEDICAL COPPER TUBES

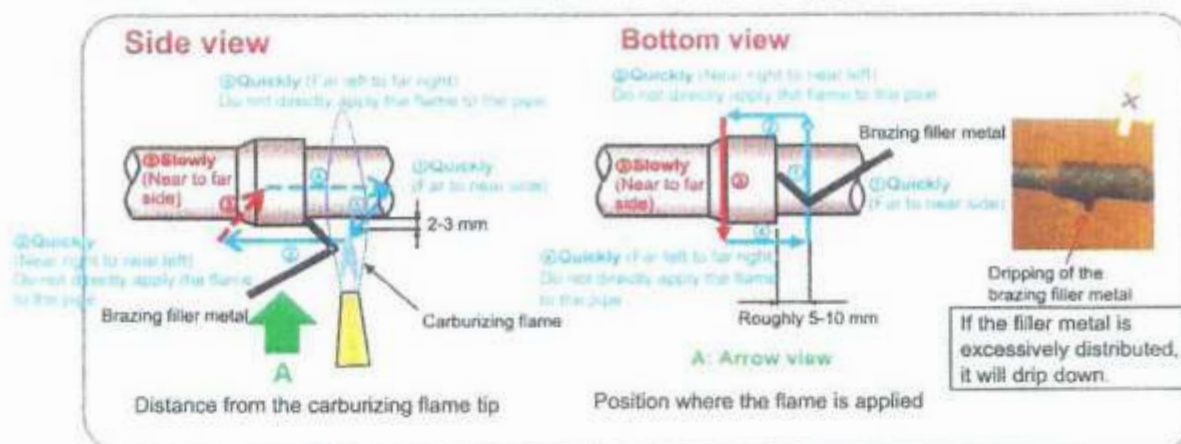
"Procedure 1: Cleaning and checking of brazing area" and "Procedure 2: Flame adjustment" are omitted as they are the same as that for downward brazing.

Procedure 3: Preheating



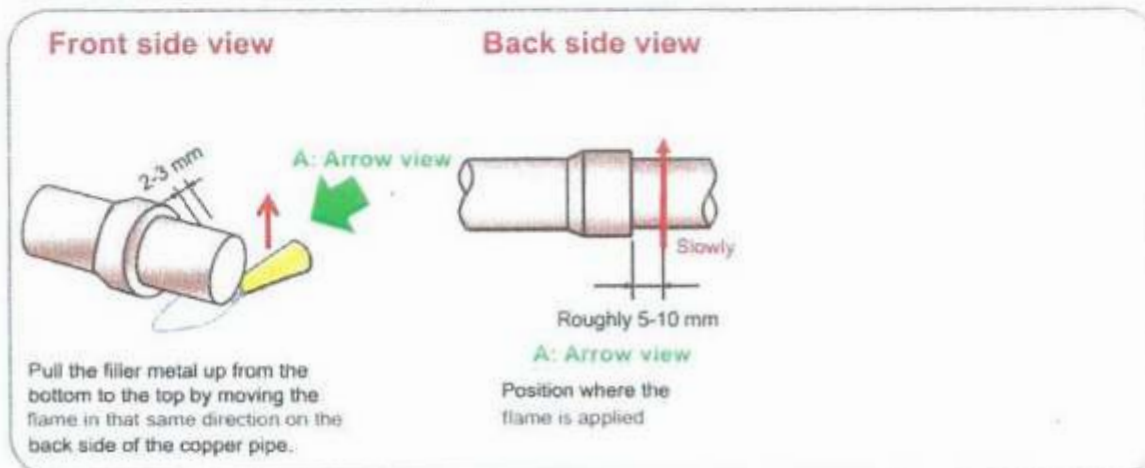
Procedure 4: Distribution of the brazing filler metal

Point 1: Distribute the filler metal little by little from the bottom side.



Procedure 4: Distribution of the brazing filler metal

Point 2: After the bottom side of the joint gap is filled with the filler metal, move the flame from the bottom to the top on the far (back) side of the copper pipe to pull the filler metal up in that same direction.



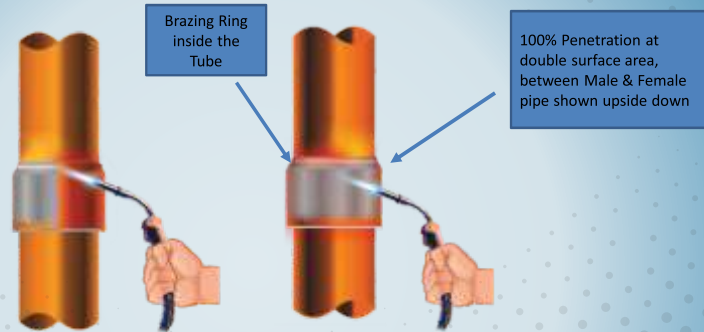
VENDOR PREFERENCE BY DAIKIN

MATERIAL SPECIFICATION SHEET

S. No.	Item Description	Specification				Make
1.	Copper Pipe: Phosphoric acid Deoxidized seamless copper pipe 1. Suitable for R410 A refrigerant 2. Tested as per JIS H3300 3. Should have clean inner surface and capped before delivery	Size ϕ (mm)	Temper	Thick (mm)		1. Mandev Tubes 2. Rajco Metal 3. Shree Shyam 4. Mehta Tubes (Max Flow) 5-Indigo 6-Hariom Metal 7-Provided by Daikin 8-Kwality tubes (Raj state)
		6.4	O	0.80		
		9.5	O	0.80		
		12.7	O	0.80		
		15.9	O	1.00		
		19.1	1/2H	0.80		
		22.2	1/2H	0.80		
		25.4	1/2H	0.88		
		28.6	1/2H	1.00		
		31.8	1/2H	1.10		
		34.9	1/2H	1.21		
		38.1	1/2H	1.32		
		41.3	1/2H	1.43		
2.	Brazing Rod: Hard Solder, Phosphorus Copper Solder					Harris
3.	Drain Pipe- PVC with 10 kg/sqcm (142.23 PSI) pressure rating.	Pipe size as per flow rate				1. Finolex, 2. Supreme 3. Prince 4. Other
4.	Insulation- 1. Closedcell Elastomeric Foam Insulation basis Nitrile Rubber/ Polyolfine	DAIPL Std	Gas Line (mm)	Liquid Line (mm)	Drain Line (mm)	1. Armacell (Armaflex, Accoflex), 2. Superlon 3. Aeroflex (Aerocell, A- Flex) 4. K-flex 5. Supreme (Insuflex) 6. Co Flex 7. Thermaflex (Thermapro Smart)
		Thickness	19	13	6	
		Note- For High Humidity Area, thickness of Drain line insulation to be increase up to 9mm.				
5.	Protection on Outdoor Piping	1. Stainless Steel Covering; 2. Galvanized tray with cover; 3. Epoxy paint over woven 100 GSM GRP mat covering over insulation. The pipe should run in GI tray covered with sheet.				
6.	Adhesive for Insulation (Bond)	SR type: SR 998/SR505, Armaflex 520 adhesive Covering: Daikin: Nitrile Rubber Tape of Armaflex or equivalent				1. Pidillite, 2. Armacell
7.	Supports for pipe	1. Any Type/ any size non rusted/painted with hard covering (like PVC Sleeve) over insulation. Insulation used should be of same thickness as used on pipe line.				
8.	Supporting Rods	Fully threaded rod: 1. For Units Installation: 8~10 mm thick with direct insertion in to the fastener 2. For Pipe Installation: 6~8 mm thick with direct insertion in to the fastener				
9.	Power Cables:					1. Finolex, 2. Polycab, 3. Havells, 4. Bonton 5. Pasaka
10.	Control Cables: Control Wire should pass through 25mm hard PVC conduit.	Control Cable: Copper sheathed cable 2C x 0.75 ~ 1.25 mm ²				1. Finolex, 2. Polycab, 3. Havells, 4. Bonton, 5. Pasaka
11.	R410a Refrigerant :	Refer to saturation chart for R410a temperature and pressure relation.				1. Dupont, 2. Honeywell

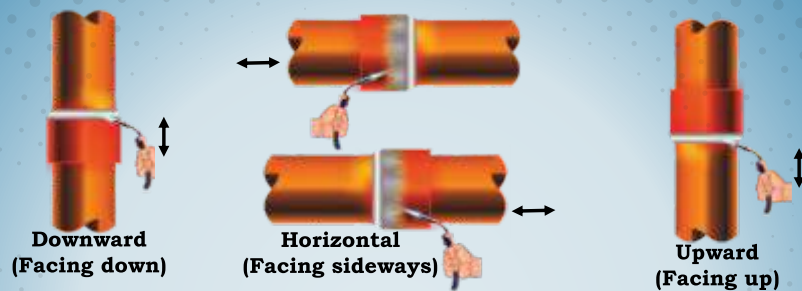
MANDEV COPPER TUBES - UNIQUE SELLING POINT (USP) & METHODS OF INSTALLATION

CASE- I RELATIVELY EASY BRAZING WITH 360° INNER BRAZING RING



In pre inserted Brazing ring copper pipes- Penetration will happen on 100% double surface area, Once brazing is completed.

CASE- II RELATIVELY EASY BRAZING WITH 360° INNER BRAZING RING



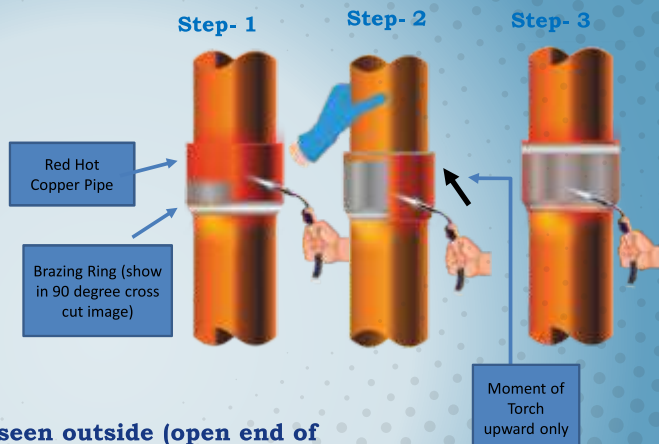
Relatively easy Difficult

It is relatively easy to distribute the Brazing filler metal when the female pipe is facing down or sideways. But, if the female pipe is facing up, it will be difficult to distribute the filler metal properly and this can result in a refrigerant leak.

Therefore, make efforts to perform the brazing with the pipe facing down or sideways.

CASE - III RELATIVELY DIFFICULT POSITION OF BRAZING WITH 360° INNER BRAZING RING

- ° Step- 1
It is normal red hot (copper color) and brazing ring is lying down and it has started to melt.
- ° Step- 2
Push little, Male pipe inside, In one end expanded female pipe, To fix it 360 degree grip also to avoid tilt/bend condition.
- ° Step- 3
When Brazing ring melt completely, Molten Brazing Material will penetrate between 100% surface area of Male and Female pipe (double surface area)



When the Molten Brazing material seen outside (open end of Expanded copper pipe) which indicate, completion of Brazing (Process).

MANDEV TUBES USP - WHY BUY MANDEV MAKE
ONE END EXPANDED COPPER TUBES
WITH BRAZING RING !!!

**DUE TO CHEMICAL & MECHANICAL
PROPERTY DEVIATIONS,
TUBES GET TEARED
DURING EXPANSION PROCESS &
TUBES GET REJECTED
AT MANDEV'S FACTORY ITSELF.**



**DURING PRODUCTION AT MANDEV'S FACTORY
OUT OF 1000 NOS. OF ONE END EXPANDED COPPER TUBES
WITH BRAZING RING, 25 TO 30 NOS. OF TUBES GET
TEARED & REJECTED, FINALLY ONLY
GOOD QUALITY TUBES ARE SUPPLIED**

**WHILE IN OTHER APPROVED MAKES-
THEY DO NOT HAVE THE PROCESS OF EXPANSION. CHEMICAL &
MECHANICAL PROPERTY DEVIATED TUBES MIGHT REMAIN IN
THEIR ACTUAL SUPPLY & GET INSTALLED & COMMISSIONED
WHICH WILL FAIL DURING IT'S OPERATION CYCLE.**

MANDEV TUBES USP - ACR CASE STUDY

HOW TO AVOID COUPLING & SAVE COST

SAVING BY INSTALLING "MANDEV MT - ECO SELF CONNECT PLUS + VERSION III, WITH 360° INNER BRAZING RING" BY SKIPPING OF COUPLING

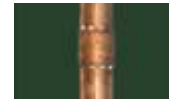


Skip Use of
Coupling



To Save 1 joint Out of
2 joints

☐



Two sided Brazed
Coupling joint
Installation

☒



One sided Brazed
Expanded
Tube joint Installation

**PRODUCT USP - SAVING IN COST OF VRF AIR-CONDITIONING GRADE COPPER TUBE FOR BUILDING PROJECT FOR 1000.4 MTR /
APPROXIMATE WEIGHT OF 417.2 KG FOR MANDEV MAKE V/S OTHER MAKE.**

**NOTE :- AS YOU SKIP COUPLING AND WHEN YOU INSTALL "MANDEV MT - ECO SELF CONNECT PLUS + VERSION III, WITH 360° INNER BRAZING RING"
SAVE 50% JOINTS IN INSTALLATION AND COMMISSIONING @ EXTRA COST OF -0.62% PER MTR OF COPPER TUBES.**

SR. NO.		PARTICULAR	OTHER MAKE	MANDEV MAKE
1		SR. No	1	2
2		Diameter Size	19.05MM	19.05MM
3		Wall Thickness	0.8 MM	0.8 MM
4		Weight Per Mtr.	0.417	0.417
COST COMPARI- SION OF COPPER TUBES	5	Copper Tube Rate Per Kgs [As on 01/08/2023] 100% PAYMENT AGAINST PROFORMA INVOICE	860.000	910.000
	6	Copper Tube Rate Per Mtr.[Sr. No. 4 x 5 = 6]	358.62	379.47
COST V/S QUALITY V/S TIME FOR MANDEV MAKE V/S OTHER MAKE ↓ FOR INSTALL- TION & COMMISS- IONING	7	Copper Tube Requirement in KG For Air-conditions	417.167	417.167
	8	Copper Pipe Requirement in Mtr. [Sr. No. 7/4 = 8]	1000.4	1000.4
	9	Standard Length of Copper Tube in Mtr.	3.05	3.05
	10	Copper Tube in Nos. [Sr. No.8/9 = 10]	328	328
	11	Assuming 2/3 Nos. of Tube [Sr. No. 10] need Coupling Requirement for other Make	218	0
	12	Coupling Cost Per Piece	46.00	0.00
	13	Total Cost of Couplings [Sr. No. 11 x 12 = 13]	10012.67	0.00
	14	Two Side Brazing Cost of Copper Coupling per Piece.	60.00	30.00
	15	Total Cost of Brazing for Two Side of Coupling for other approved make V/s One side of One End Expanded with Pre Inserted Brazing (Mandev Make) [Sr.No. 11 X 14 = 15]	13060	6530
	16	Total Cost [Sr. No. (5 x 7) + 13 + 15 = 16]	381836	386152
	17	Copper Tube Rate Per Mtr.(Including Brazing cost with coupling for other make V/s with One End Expanded with Pre Inserted Brazing Mandev make [Sr.16/8=17]	381.68	386.00
	18	NET SAVING / EXTRA COST PER Mtr. in Percentage (%)	0.00%	-1.12%
	19	Actual Percentage (%) SAVING / EXTRA COST FOR MANDEV MAKE	{ EXTRA COST :- (-1.12%) EXTRA COST (+ 0.5%) SAVING IN NITROGEN = (-0.62%) } TOTAL EXTRA COST PER MTR.	
	20	No of Joints	436	218
21		No of Joints Saved	0	218
22		Percentage (%) of Joints Saved	0.00%	50.00%
23		Actual RMT of Copper Tube Requirement [Sr. No. 8 for Diameter 19.05 mm]	1000.4	{ 1) COMPLETE VRF PIPING CIRCUIT FOR PROJECT } { 2) TOTAL QUANTITY IN MTRS }
24		Actual Nos. of Joints Saved [Sr. No. 21 for Diameter 19.05 mm]	218	{ SAVINGS OF TOTAL NOS OF BRAZING JOINTS } FOR COMPLETE PROJECT
25		For Length of every 9 running mtr. Air-Conditioning Tubing System [Sr.No. 23/24 = 25]	Save 1 Joint, By Installing Mandev Make - "MT ECO SELF CONNECT PLUS + VERSION III, WITH 360° INNER BRAZING RING"	
26		Conclusion	Sr. No. 23, In Length Of 1000.4 Mtr. Air-Conditioning Tubing Circuit In Building Projects, 218 Nos. Of Joints Are Saved. So, In Every 4.5 Mtr Length 1 Joint Gets Eliminated And Field Failure Due To Human Error In Brazing Is Removed For 218 Joints.	
EVERY 4.5 Mtr		1000.4 Mtr / 218 Nos. SAVE BRAZING JOINTS = 4.5 Mtr (15 Feet)		

Sales Office : 706, Lodha Supremus, 7th Floor, Senapati Bapat Marg, Railway Colony, Lower Parel, Mumbai - 400013, Tel.: +91-22-66131818 Website : www.mandevtubes.com

MANDEV TUBES USP - ACR CASE STUDY

HOW TO AVOID ELBOW & SAVE COST

SAVING BY INSTALLING "MANDEV MT - ECO SELF CONNECT PLUS + VERSION III, WITH 360° INNER BRAZING RING" BY SKIPPING OF ELBOW



Skip use of Elbow



To Save 2 joints



2 Sided Brazed Elbow
Joint Installation



No joint, No Brazing
Installation

PRODUCT USP - SAVING IN COST OF VRF AIR-CONDITIONING GRADE COPPER TUBE FOR BUILDING PROJECT FOR 1000.4 MTR /

APPROXIMATE WEIGHT OF 417.200 KG FOR MANDEV MAKE V/S OTHER MAKE.

NOTE :- AS YOU SKIP ELBOW AND WHEN YOU INSTALL - " MANDEV MT - ECO SELF CONNECT PLUS+ VERSION III, WITH 360° INNER BRAZING RING",

SAVE 50% JOINTS IN INSTALLATION AND COMMISSIONING @ EXTRA COST OF 1.07% PER MTR OF COPPER TUBES.

NOTE [I] :- IF YOU DO BENDING OF HALF HARD COPPER TUBE ON SITE, THERE WILL BE NO CHARGES FOR BRAZING AND JOINING ELBOWS WITH TUBES.

NOTE [III]:- ONLY TIME FOR BENDING WILL BE SPENT ON MECHANICAL BENDER. (ONE TIME INVESTMENT FOR BENDER.) BENDER AVAILABLE IN MARKET UPTO 35 MM.

SR. NO.	PARTICULAR	OTHER MAKE	MANDEV MAKE
1	SR. No	1	2
2	Diameter Size	19.05MM	19.05MM
3	Wall Thickness	0.8 MM	0.8 MM
4	Weight Per Mtr.	0.417	0.417
COST COMPARI- SION OF COPPER TUBES	5	Copper Tube Rate Per Kgs [As on 01/08/2023] 100% PAYMENT AGAINST PROFORMA INVOICE	860.000
	6	Copper Tube Rate Per Mtr. [Sr.. No. 4 x 5 = 6]	358.62
COST V/S QUALITY V/S TIME FOR MANDEV MAKE V/S OTHER MAKE ↓ FOR INSTALL- TION & COMMISS- IONING	7	Copper Tube Requirement in KG ForAir-Conditions	417.167
	8	Copper Pipe Requirement in Mtr. [Sr. No. 7/4 = 8]	1000.4
	9	Standard Length of Copper Tube in Mtr.	3.05
	10	Copper Tube in Nos. [Sr. No. 8/9 = 10]	328
	11	Assuming 1/3 Nos. of Tube [Sr. No. 10] need Elbow Requirement for other Make	108
	12	Elbow Cost Per Piece	78.00
	13	Total of Cost Elbow V/s No Cost of Elbow [Sr. No. 11 x 12 = 13]	8424.00
	14	Two Side Brazing Cost of Copper Elbow per Piece.	60.00
	15	Total Cost of Two Side Brazing of Elbow [Sr.No. 11 x 14 = 15]	6480
	16	Total Cost [Sr. No. (5 x 7) + 13 + 15 = 16]	373667
	17	Copper Tube Rate Per Mtr. (Including Brazing cost with Elbow for other make V/s with One End Expanded with Pre Inserted Brazing Ring for Mandev make	373.52
	18	NET SAVING / EXTRA COST PER Mtr. in Percentage (%)	0.00%
19	Actual Percentage (%) SAVING / EXTRA COST FOR MANDEV MAKE	{ SAVING : (1.57% SAVING (+0.5% SAVING IN NITROGEN = (1.07%) TOTAL SAVING PER MTR. }	
20	No of Joints	216	0
21	No of Joints Saved	0	216
22	Percentage (%) of Joints Saved	0.00%	100.00%
23	Actual RMT of Copper Pipe Requirement (Sr. No. 8 for Diameter 19.05 mm)	1000.4 { 1) COMPLETE VRF PIPING CIRCUIT FOR PROJECT 2) TOTAL QUANTITY IN MTRS }	
24	Actual No. of Joints Saved (Sr. No. 21 for Diameter 19.05 mm)	216 { SAVINGS OF TOTAL NOS OF BRAZING JOINTS FOR COMPLETE PROJECT }	
25	For Length of every 4.5 running mtr. Air-Conditioning Tubing System [Sr. No. 23/24 = 25]	Save 2 Joints, By Installing Mandev Make - "MT - ECO SELF CONNECT PLUS+ VERSION III WITH 360° INNER BRAZING RING"	
26	Conclusion	Sr. No. 23, In Length Of 1000.4 Mtr. Air-Conditioning Tubing Circuit In Building Projects, 216 Nos. Of Joints Are Saved. So, In Every 4.5 Mtr Length 1 Joint Gets Eliminated And Field Failure Due To Human Error In Brazing Is Removed For 216 Joints.	
EVERY 4.5 Mtr & 2.3 Mtr	1000.4 Mtr / 216 Nos. SAVE JOINTS = 4.5 Mtr / 15 Feet		
	So, 1000.4 Mtr/ 434 Nos. (218 Nos Coupling Joints + 216 Nos Elbow Joints) SAVE JOINTS = 2.3 Mtr / 7.5 Feet		

Sales Office : 706, Lodha Supremus, 7th Floor, Senapati Bapat Marg, Railway Colony, Lower Parel, Mumbai - 400013, Tel.: +91-22-66131818 Website : www.mandevtubes.com


MANDEV TUBES COST EFFECT COMPARISON - FOR USING MANDEV MAKE V/s OTHER MAKE ON PER 1 HP / (0.8 TON) VRF AIR CONDITIONING SYSTEM

SR. NO.	Description	OPTION-1 WITH CASSETTE / DUCTABLE INDOORS	OPTION-2 WITH HIGH WALL INDOORS
A)	High Side (Approx Value) VRF Equipment Indoor & Outdoor)	45000/-	40000/-
B)	Low Side (Approx Value)	12000/-	12000/-
C)	TOTAL COST OF (VRF SYSTEM) (A+B)	57000/-	52000/-
D)	(MANDEV MAKE COPPER TUBES COST) Example : Approximate 3 Kgs of Copper Tubes will be required (For Per HP for VRF System) CALCULATION : For Copper Tubes Per HP Cost = Cost Per Kgs Copper Tubes = 1050/- *1 Cost For 3 Kgs Copper Tubes = 3150/-	3150/-	3150/-
E)	(OTHER APPROVED MAKES COPPER TUBES COST) Example : It is catered 2.7 Kgs of Copper Tubes 10% less in weight, As per VRF Mfg. specification) CALCULATION : For Copper Tubes Per HP Cost. Cost Per Kgs Copper Tubes = 950/- Cost For 2.700 Kgs Copper Tubes = 2565/-	2565/-	2565/-
F)	Cost Difference between Mandev & Other Make	585/-	585/-
G)	Extra Cost Copper Tubes Per HP for VRF System (In %) (F + C)	1.02%	1.13%

H) QUALITY ENHANCE - WITH MANDEV MAKE PIPES ONLY
CONCLUSION
ADVANTAGES OF MT-ECO SELF CONNECT PLUS+ VERSION III, WITH 360° INNER BRAZING RING FOR REFRIGERENT PIPING FOR VRF SYSTEM
(1) RELIABILITY :

- (i) MT-ECO SELF CONNECT PLUS+ VERSION III, WITH 360° INNER BRAZING RING – Reduces No of Joints by 50% & thus chance of leakages also reduce by 50%
(ii) MT-ECO SELF CONNECT PLUS+ VERSION III, WITH 360° INNER BRAZING RING – Stress relieved, After expansion - No oxidation, Under Factory Controlled condition, for better Brazing at Project Site.

(2) SAVING :

- (i) Material : Use of Mandev make (VRF Grade) Copper Tube save 50% Joints (with One End Expanded Copper Tubes) / As compare to any other Approved Make (Using Socket/Coupling).
(ii) Labour : Ease of installation Better workmanship. Reduce human error (iii) Time : Reduce Installation & Brazing Time.

(3) QUALITY : (Standard – Mandev Assurance As per JIS 3300 C12200

- (i) Copper Content : 99.9 % & Above and Phosphorus content between 0.015 % and 0.040 %.
(ii) Inner Surface Tubes : For VRF Air-conditioning Grade Copper Tubes – Total loss lubricant to be used for Mirror Finish Clean inner surface tube.
(iii) Residue Content to be less than 0.038 mg/dm² (iv) End cap are to be put on tubes.

Based on above, It can be seen there is huge saving in complete life cycle cost of VRF Installation, Due to low maintenance.

NOTE (1) Based on Customer Feedback, Instead of Mandev Tubes Copper Tubes & Coils - 6.35mm X 0.8mm & 12.7mm X 0.8mm (25 Feet Long), It is bought & Installed 6.35mm X 0.72mm And 12.7mm X 0.72mm (Which is with (-) minus 10% Tolerance of some other Approved Make of Copper Tubes.

SR. NO.	COPPER PIPE SIZES (AS PER VRF SPECIFICATION) (In mm)	Weight Per Soft Copper Coil (As Per Section Weight) (In Kgs)	MANDEV TUBES STANDARD		OTHER MAKE STANDARD	
			Actual Thickness (In mm)	Actual Weight Per Piece (In Kgs)	Actual Thickness (10% Minus Side) (In mm)	Actual Weight Per Piece (In Kgs)
1	O.D. 6.35 X W.T 0.8 X 50'	1.900 Kgs	0.8 mm	1.900 Kgs	0.72 mm	1.710 Kgs
2	O.D. 12.7 X W.T 0.8 X 50'	4.100 Kgs	0.8 mm	4.100 Kgs	0.72 mm	3.690 Kgs
Actual Weight for Soft Copper Coils 15.24mtr (50 feet)			(COMBINATION)	6.000 Kgs	(COMBINATION)	5.400 Kgs
Example for above Calculation is taken for Piping Cost Comparison		7.12 mtr (25 feet)	Sr.1 (0.8mm) Sr.2 (0.8mm)	3.000 Kgs	Sr.1 (0.72mm) Sr.2 (0.72mm)	2.700 Kgs

***1 - Comparatively manufactured 2.7 Kgs Per HP (10% Less in weight), (by Mandev tubes Competitors), Taking advantage of Manufacturing Tolerance on negative side, at cheaper Cost**

NOTE (2) The price shared above is Basic & GST is extra at actual.

NOTE (3) (I) above calculation is based on general assumption of vrf installation, (ii) However, it may change from project to project.
(iii) Also, kindly Need To Consider different Building Location, May have different requirements.



**DRAW BENCHES –
DRAWING & CORRECT SIZING OF PIPING IS DONE**



**EDDY CURRENT TESTING MACHINE -
REMOVE DEFECTIVE TUBES FROM FINAL PRODUCTION**



**INERT ATMOSPHERE BRIGHT ANNEALING
FURNACE - PRODUCES INSIDE
SURFACE MIRROR FINISH PIPES.**

ACR OEM VENDOR APPROVAL



DAIKIN AIRCONDITIONING INDIA PVT. LTD.

12th Floor, Building No. 9, Tower 'A', DLF Cyber City, DLF Phase III,
Gurugram - 122 002, Haryana, INDIA Tel. : +91-124-4555444, Fax : +91-124-4555333
Corporate Identification Number (CIN) - U74699DL2000PTC104990
Website: www.daikinindia.com, e-mail: ho@daikinindia.com

DAIPL/TS/VRV/CU/2/23

11/09/2023

Kind Attention: Mr. Ramesh R. Munot
Mandev Tubes Pvt. Ltd.
Umbergaon

Sub: Approval to "Mandev Tubes – MT ECO SELFCONNECT PLUS" (One end expanded half hard copper tube) & MT ECO FLEX PLUS" (Pancake coil copper tube)" copper pipes as recommended make to use in projects at site

Dear Mr. Ramesh,

M/s Mandev Tubes Pvt. Ltd. had been approved by Daikin Air-Conditioning India Pvt. Ltd. (referred to as "DAIPL" hereinafter) as a "Non-exclusive" and recommended copper pipe make to be used in projects at site vide approval letter no. **DAIPL/RK/DEC/CPR/03 dated 17.01.2017**.

As per DAIPL standard process, re-verification need to be conducted in every 3 years or as & when required due to any changes in manufacturing process / specifications.

As part of the re-verification process, our team has reviewed all the information/documentation submitted in detail by you & also visited your manufacturing facility on **18.04.2023**.

We are happy to inform you that we shall continue the above mentioned product of yours as one of our recommended make for copper piping to be used on site works at projects of DAIPL VRV system.

Kindly find below points which need to be followed & obliged as part of this approval:

1. Routine tests should be carried out as per Annexure 1.
2. Test certificate / Raw Material Certificates / QAP / Quality check method need to be shared once in a year with DAIPL team.
3. Tools / equipment's calibration certificate need to be shared once in a year with DAIPL team.
4. Issue / complaints should be inspected by M/s Mandev Tubes Pvt Ltd as & when required on timely basis by M/s Daikin Air Conditioning India Pvt Ltd & need to be resolved in 15 days.
5. Audit by DAIPL team can be carried out as and when required.
6. If there are any major changes in the manufacturing process / specifications, same need to be informed to DAIPL on immediate basis.

This approval is valid till **11.09.2026** subject to no complaint from field about quality & supply of the only approved specification product to our channel partners and/or any deviation / discrepancy found in the above mentioned points / specification; in which case this authorization is liable to be cancelled at the sole discretion of DAIPL.

Please acknowledge the receipt of this letter as the acceptance for the terms and conditions stated herein-before.

Thanks,

For Daikin Air-Conditioning India Pvt Ltd


Gaurav Mehtani
General Manager
Product Management & Tech Support




Mukesh Kumar
Senior Manager
VRV Project Management & Tech Support



ACR OEM VENDOR APPROVAL

LG Electronics

LG Electronics India Pvt. Ltd.
D-3, PSE, A-Wing, 3rd Floor, Prius Building, District Centre, Saket, New Delhi-110017
T: 91-9673312124 Website: www.lge.com
CIN No. U32107DL1997PTC20109

Dated: **19th Sep. 2018**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **M/s. Mandev Tubes Pvt. Ltd.**, with their factory located at 269, G.I.D.C Industrial Estate, Umbergaon, Dist. Valsad (Gujarat), is an approved supplier for VRF ACR Grade Copper Tubes to LG Electronics India Pvt. Ltd. (LGEIL), in below product category.

- Half Hard Straight Copper Tubes.
- Pancake Copper Coils.
- Copper Tubes Fittings.

As per records of the Company, the performance of Mandev Tubes Pvt Ltd is found to be satisfactory.

For LG Electronics India Pvt Ltd

Authorized Signatory
Amol Verma

Validity: 1 Year from date of Issuance.
Note: This certificate is being issued without prejudice to the rights and contentions of LG Electronics India Pvt. Ltd. and this certificate shall not be construed as validation/approval of performance of the obligations of Vendor with respect to business relation with LGEIL.

<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> MITSUBISHI HEAVY INDUSTRIES AIR CONDITIONERS HEAVY DUTY </div> <div style="text-align: center;"> IAPL GROUP PVT. LTD. </div> </div>		
APPROVED MAKE LIST		
S.No.	Name of Component	Approved Makes/Brands
1.	TRANSMISSION CABLE (CONTROL CABLE)	GLDSTER/GRANDLEY/SKYTONE/HUMON/DELTON/UNIVERSAL/ POLYCAR/HAVELLS
2.	PVC CONDUIT	BEC/ARG/AVON PLAST/SURYA/POLYPACK/PRAKASH/ARG/ MARSHAL/PLAZA
3.	REFRIGERANT	DUPONT/HONEYWELL FLUORON
4.	REFRIGERANT PIPES	MANDEV/RACCO/TOTAL LINE
5.	REFRIGERANT PIPE INSULATION	ARMAFLEX/ E- FLEX/ARMACELL SUPREXON
6.	DRAIN PIPE	HIGH DENSITY POLYSTYRENE POLYPACK/SUPREME/ARG
7.	ADHERIVE FOR PIPE INSULATION	FIDILITE SH-PPU/SBS
8.	POWDER COATED ALUMINUM GRILL/DIFFUSORS	DYNAMIC/ASHFLOW/SYSTEMAIR/AIRMASTER/EXERME/ BALANCE/TRISTAR/ OPELLA/CARRVAIRE
9.	DUCT INSULATION	ARMAFLEX/ARMACELL/TROCELLIN
10.	GI SHEETS	TATA/SAIL/INDAL/BHUSHAN
11.	VIBRATION PADS	RECHSTROFLEX/DUNLOP
12.	FLEXIBLE DUCT	CARRVAIRE/ATCO/MMP
13.	FACTORY MADE DUCT UP SPIRO/ZECCO/CARRVAIRE	UP SPIRO/ZECCO/CARRVAIRE/BOLAKSTAR
14.	PVC PIPE(20KG DENSITY) POLYPACK/SETIA	POLYPACK/SETIA
15.	CROSS LINKED POLYETHYLENE INSULATION FILM FOR DUCTING REFRIGERANT AND DRAIN PIPE	PARAMOUNT/SUPREME
16.	PRE-LAMINATED FIBER GLASS ROLLS	UP TWIGA/KIMCO/OWENS CORNING
17.	POWDER COATED GRILL/DIFFUSER	CARRVAIRE/BALANCE/RAVI-STAR
18.	EXTRUDE AL-GRILLES/DIFFUSERS /DAMPERS	BALANCE/TRISTAR/OPELLA/CARRVAIRE
19.	BRAZING ROD (2% - 4% SILVER BRAZING ROD)	HARRIS, RAJA LAXI
20.	THREADING ROD	INDAL, TATA
21.	EASTNER (FOR INDOOR UNIT HANGINGS & REFRIGERANT SUPPORTING)	BULT, FISHER, WORTH
22.	NITROGEN AND OXYGEN GAS	ONQ/ HIGH PURITY GAS TO BE USED

ACR OEM VENDOR APPROVAL



01/05/2023.2022

Mandev tubes Pvt Ltd
Mumbai

Subject : Mandev Make copper piping approval as one of recommended make to use in VRF installation.

Kind Attention : Ms Ramesh

Dear Mr Ramesh

With reference to your request of including your product of copper piping (Mandev) in our approved list of makes, we have reviewed your information, documentation, test report submitted and sample of the product.

Based on above, we hereby approve use of your product (Copper Piping) in our VRF system. As discussed & mentioned in your documents, copper tubes shall be DHP Grade raw material with 99.99% copper & .015 to .04% phosphorus. It should be super clean quality with low residual content below .038gm/sqm. Your hologram should be there on pipes.

It shall have 360 deg concentric wall thickness along the entire length & should be 100% eddy current tested.

Half hard pipe should conform to ASTM B375/ASTM280 (C12200)/JIS H13300 (C12200)/BS2871 Part 3 (C1106) & Soft pipes should be bright annealed (Mirror finish) conforming to ASTM B368/JIS H13300

This approval is valid for one year from the date of issue of this letter i.e upto 30th April 2024. We will observe it for one year for quality, specifications & performance and if found in order we will issue fresh letter for continuation next year.

All rights are reserved with us about approval as recommended make.

Any complaints/quality issues etc shall be promptly inspected by Mandev Pipes Pvt Ltd or as and when required by Blue Star limited.

There should not be any variation in specification approved and same approved specific product to be supplied to our channel partners.

Thanks and regards
For Blue Star limited

Deepak Bawejia
DGM- All India Planning & Installation
Commercial Airconditioning Divn.

Blue Star Limited
Val 1a Alium,
6th floor, Sector 53,
Golf Course Road,
Gurgaon-122002, India.
T : +91 124 4694001
F : 191 174 3684001
www.buestar.com

Registered Office: Kastur Buildings, Molen T Adesh Chowk, and on T. L Road,
Mumbai 400022, India. T : +91 22 6655 4100 F: 491 22 6655 4152.
CIN: L28290WBHS39PLC0165701

ETA

ETA GENERAL PRIVATE LIMITED

Corporate Office : Seethakathi Chambers, 5th Floor, 688, Anna Salai, Chennai - 600 006.
Ph : (044) 28297526 Fax : (044) 43099770 e-mail : ogeneral@mds-vent.net.in Web: www.generalindia.com

GENERAL

SUPPLIER RATING CERTIFICATE

To,

M/s Mandev Tubes,

Plot No - 284/2, A-1, Gol Canteen Road,
Umbergon Dist- Valsad (Gujarat)
Umbergaon -396 171.

02.02.2008
CHENNAI

Kind Attn :- Mr Ramesh Munot / Mr Patel

Sub : - Suppliers Rating for the Brilliant job in Customer service
(Mandev Tubes)

Dear Mr Ramesh,

This is to inform you that we are very much Satisfied with your customer service and want you to continue for the further supplies too. We have no marks in updating your service, thus we are giving you 'A' Grade.

Regards,
G.Venkatesh.

Senior Manager
Purchase Dept
ETA General Pvt Ltd.

ACR OEM VENDOR APPROVAL



Ref: Haier/HO/2019/05-02/0007

2nd May' 2019

To,

Mandev Tubes Pvt. Ltd.
Mumbai

Sub: 'Mandev' Copper piping Approval as recommended make to use in MRV Installation

Dear Sir,

We are pleased to inform you that we have been using Mandev make copper pipes for our MRV installations and found them to be in line with our specifications.

Our factory team has also inspected the pipes in installation sites and they are happy with the specifications.

We also would like to inform you that we have been recommending Mandev copper pipes for our MRV Installations.

This is approval valid till we receive any complaint from field about change in current quality and specifications. All complaints should be resolved by Mandev Tubes Pvt. Ltd., if any.

Thanking you,
For Haier Appliances India Pvt. Ltd.


Debajit Sen
Product Group Head
Commercial Air-conditioner

Haier Appliances (India) P. Limited

Corporate Identity Number (U74140DL2003PTC119101)

Registered Office: Building No 1, Okhla Industrial Estate, Phase – III, New Delhi – 110 020

Tel: 011-39496000/30674000, Fax: 011-30674088, website: www.haier.com/in



SAMSUNG INDIA ELECTRONICS LTD.

To: ALL S & S DEALERS (FOR DVM PROJECTS) In INDIA.

Sub: Copper Tubes uses in the DVM Projects

Please note that the following mentioned maker is approved for Copper Tubes to be used by all the S & S Dealers (India) for all DVM Projects installation:-

- **Mandev Tubes Pvt. Ltd, Mumbai.**

Following are the specification of the Copper Tubes to be used for the DVM Projects installation purpose:

Size	Thickness	Specification
6.35mm (1/4 in)	24 G	C1220T-O (ANNEALED)
9.52mm (3/8 in)	24 G	C1220T-O (ANNEALED)
12.70mm (1/2 in)	22 G	C1220T-O (ANNEALED)
15.88mm (5/8 in)	22 G	C1220T-O (ANNEALED)
19.05mm (3/4 in)	20 G	C1220T-1/2 H (HALF-HARD)
22.23mm (7/8 in)	20 G	C1220T-1/2 H (HALF-HARD)
25.40mm (1 in)	20 G	C1220T-1/2 H (HALF-HARD)
28.58mm (1 1/8 in)	18 G	C1220T-1/2 H (HALF-HARD)
31.75mm (1 1/4 in)	18 G	C1220T-1/2 H (HALF-HARD)
38.10mm (1 1/2 in)	16 G	C1220T-1/2 H (HALF-HARD)
44.45mm (1 3/4 in)	16 G	C1220T-1/2 H (HALF-HARD)
50.8mm (2 in)	14 G	C1220T-1/2 H (HALF-HARD)

Thanks & Regards,
R & D – SE Team

GOVT. VENDOR APPROVAL - BHABHA ATOMIC (BARC)

TSD BUILDING,
TROMBAY, MUMBAI,
PIN: 400085



Tel: (022) 2559-2532
Fax: 25505310/25505151

**GOVERNMENT OF INDIA
BHABHA ATOMIC REAEARCH CENTRE
INFRASTRUCTURAL PROJECTS DIVISION**

Ref : IPD/MPS/UMRT/(8/2010-11)/10

Date: 05/10/11

M/s. Mandev Tubes Pvt. Ltd
276, Surya Mahal, 2nd Floor,
Office No. 82, J. S. S. Road,
Mumbai – 400 004
Maharashtra State (India).

Sub: Tender No. BARC/IPD/8/2010-11 – Evaluation Of your Copper tube manufacturing facility by our department and supply of the material to our premises-reg:-

This is in connection with our visit to your factory during the month of July 2011, for the evaluation of your copper tube manufacturing facility in Gujarat. We appreciate the efforts taken by you and other members of your team to maintain good quality standards for the copper piping manufactured in your factory. The technical presentation arranged by you on 11-08-11 at our office was very informative and useful for all our personnel who are working in the field of HVAC. The right methods to be adopted while laying the copper piping for HVAC systems, especially for variable flow refrigerant machines were covered in detail, in the presentation. Also, you have already visited our premises to check and ensure that the copper tubes supplied through the dealer are genuine with respect to the quality and make. Now, the work of laying of copper tubing is in progress and we may need your assistance also to ensure that quality of work carried out is top class.

With regards

Anilkumar T V
SO/G, MD & PS
TSD

GOVT. VENDOR APPROVAL - CITY AND INDUSTRIAL CORPORATION OF MAHARASHTRA (CIDCO) & MAHARASHTRA PUNE METRO RAIL PROJECT

TOSHIBA
Leading Innovation >>>

CIDCO

CITY AND INDUSTRIAL DEVELOPMENT CORPORATION OF MAHARASHTRA LIMITED

HEAD OFFICE
CIDCO, 2nd Floor, National Road,
Mumbai - 400 001
PHONE: (022) 421 11 11 to 22 40 01 (PUB) 40 01 02
FAX: (022) 421 20 00 (PUB) 40 01 01

HEAD OFFICE
CIDCO Bhamburda, CIDCO Bhamburda
New Mumbai - 401 002
PHONE: (022) 47 01 0000
FAX: (022) 47 01 0000

Ref No: CIDCO/EE (MR-I/2018) (1-1)
Date: 10.12.2018

To:
M/s Prakash Constrowell Ltd.
The Exchange Plot No. - 2A,
Tombak Road Near Ved Mandir,
Tolke Colony, Nask - 422 002

Sub: Design & Construction of Balance Works of Six Nos. of Elevated Metro Stations at Sector 7 CBD Belapur, Science Park, Ulhas Chowk, Sector 11 & Sector 14 of Kharghar and Elevated Terminal Station at Belapur for Navi Mumbai Metro Line-1.
C.A. No. 02/CIDCO/ACE (I&Metro)/SE (Metro-I)/2017-18

Ref: i) Work Order No. CIDCO/SE (Metro-I)/2017/528, dated 17.10.2017.
ii) Letter No. PCL/CIDCO/Belapur/2017-18/630, dated 06.08.2018
iii) Letter No. LBG/MMM/CDC/IN/2/E & M/105503, dated 28.08.2018

Approval of M/s Mandev Tubes Pvt. Ltd. as a Vendor to supply the Copper Tubes for Air Conditioning works at Metro Stations -

Dear Sir,

The above mentioned work was awarded to you vide above referred work order. Vide letter under reference no (i) above, you have requested for the approval of M/s Mandev Tubes Pvt. Ltd. as a Vendor to supply the Copper Tubes for Air Conditioning works for above mentioned work. Similarly vide letter under reference no (ii) above, GC-LBG also recommended the above vendor. The Competent Authority accorded the approval to M/s Mandev Tubes Pvt. Ltd. as a Vendor to supply the Copper Tubes for Air Conditioning works for the work of Six Nos. of Metro Stations for Navi Mumbai Metro Line under CA No. 02/CIDCO/ACE (I&Metro) /SE (Metro-I)/2017-18.

This is for your information and further necessary action please

Thanking you,

Yours faithfully,
(M.H. Mulani)
Ex-Executive Engineer (Metro-I)

RECEIVED
PCL
Date: 10/12/2018
Time: 11:11 AM
By: [Signature]

GENERAL CONSULTANTS
MAHARASHTRA METRO RAIL CORPORATION LTD
(PUNE METRO RAIL PROJECT)

GC/PMRP/PR3/MEP/HAL/2021/1887
Date: 28/08/2021

M/S HCC - ALFA A JOINT VENTURE,
101/102, 1st Floor, Baha House,
Anand Nagar, Pune
Andheri (E) Mumbai - 400 093

Project: Construction of Nine elevated metro stations excluding the station PMRC, San: Tukaram Nagar, Bhasani, Kharwad, Pimpri, Durgam Chaudh, Khairi and Hareli Hill on Corridor 1 of Pune Metro Rail Project

References:
1) H-5 JV/PR-3/2021 dated 09/11/2021
2) H-5 JV/PR-3/2021 dated 12/12/2021
3) H-5 JV/PR-3/2021 dated 15/01/2021

Subject: Vendor credentials of Refrigerant Copper Pipes, L Panels and Diesel Generator for Kharwad Metro station at R3 section.

Dear Sir,

With reference to above, no objection is accorded for B Vendor proposals as mentioned in above table, subject to compliance of Contract specifications / BOQ.

S.NO	ITEM / SPECIFICATION	VENDOR
1	Refrigerant Copper Pipes	M/s Mandev Tube Pvt. Ltd.
2	L Panels	M/s Siemens (Switchgear & Control Pvt. Ltd.)
3	Diesel Generator Sets	M/s KGF (Kharwad)

However, in accordance with SCC Sub-clause 3.1 (c) any approval, check, certificate, consent, endorsement, inspection, instruction, proposal, request, test or similar act by the Engineer (including observation or disapproval) shall not relieve contractor from any responsibility he has under the contract, including responsibility for errors, omissions, discrepancies, and non-compliance.

YOURS SINCERELY,

SURESH KUMAR
PROJECT DIRECTOR
GC/PMRP

CC: 1. DIRECTOR (CONSTRUCTION) METRO FOR KIND INFORMATION PLEASE.
2. GM (Engineering), MAHA Metro
3. Addl. CPM/Engineering/MAHA Metro

AECOM SYSTRA

A3 Block, Food Grain Storage Godown,
Near Chief Court, Next to Ramgarh Punia
Vasahat, Shreekrishna, Pune-411 005, MH | INDIA.

CLIENT TESTIMONIAL - DELHI METRO (DMRC)



DATE: 12/07/2018

TO WHOMSOEVER IT MAY CONCERN

This is to certify that we have procured and installed Mandev Make VRF Grade Copper Tubes for Air-conditioning Application of various sizes for our **DELHI METRO RAIL CORPORATION LINE 7 Number of Station 17.**

Mandev Tubes "MT ECO FLEX" – (SOFT PANCAKE COIL COPPER TUBE) & "MT ECO SELF CONNECT PLUS +" (ONE END EXPANDED - HALF HARD COPPER TUBE)

"WHICH ELIMINATES 3 OUT OF 4 BRAZING JOINTS AND AVOID POTENTIAL CHANCES OF LEAKAGES DUE TO HUMAN ERROR" & ENHANCES LG'S VRF AIR-CONDITIONING PIPING CIRCUIT LIFE OF METRO STATIONS, DEPOTS AND BUILDINGS.

We have found the quality of copper tubes satisfactory and meeting the air-conditioning standards.

M/s. LARSEN & TOUBRO,

For Larsen & Toubro Limited
Power Transmission & Distribution (D)-IC


(Manoj Kumar Tyagi)
Project Manager
Power Transmission & Distribution



दिल्ली मेट्रो रेल कॉर्पोरेशन लिमिटेड
Delhi Metro Rail Corporation Limited

TURNKEY PROJECTS • HVAC



airef engineers(p) ltd.

Corporate Office : B-23, Infocity, Sector-34, Gurgaon-122001
Phones : 0124-4669600 to 60, Fax : 0124-4669698 & 99

Registered Office : 117, Tagore Park, Delhi-110009

Phones : 27442508, 27442509, Fax : 27442506

CIN : U74899DL1995PTC073590

E-mail : info@airefengineers.com Website : www.airefengineers.com

Date:22/06/2017

To Whomsoever It May Concern



This is to certify that we have procured and installed Mandev make copper tubes of various sizes for our **DMRC Line-6 Project(9 stations) & DMRC Line-8 Project(10 stations).**

We have found the quality of copper tubes satisfactory and meeting the industry standards.





KHALID ASHFAQUE
GM (PROCUREMENT)






Airef Engineers Pvt Ltd
B-23, Infocity, Sector-34,
Gurgaon, 122001



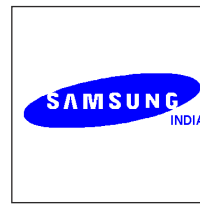
दिल्ली मेट्रो रेल कॉर्पोरेशन लिमिटेड
Delhi Metro Rail Corporation Limited

CLIENT TESTIMONIAL METRO-LINK EXPRESS FOR GANDHINAGAR & AHMEDABAD (MEGA) & MAHA METRO NAGPUR

 <p>Vallabh Aircon We Create, You Feel</p>	<p>TOSHIBA Leading Innovation >>></p> <p>info@vallabhaircon.com vallabh.aircon@gmail.com www.vallabhaircon.com</p> <p>+91 79 23600442</p> <p>201-204, Swagat Rainforest-II, A-Block, 2 Floor, Opp. Swaminarayanmham, Kudasan, Gandhinagar-382421.</p>
<p>DATE: 21-06-2018</p>	
<p><u>TO WHOMSOEVER IT MAY CONCERN</u></p>	
<p>This is to certify that we have procured and installed Mandev Make VRF Grade Copper Tubes for Air-conditioning Application of various sizes for our MEGA METRO – Ahmedabad , Depo project.</p>	
<p>Mandev Tubes “MT ECO FLEX” – (SOFT PANCAKE COIL COPPER TUBE) & “MT ECO SELF CONNECT PLUS +” (ONE END EXPANDED - HALF HARD COPPER TUBE)</p>	
<p>“WHICH ELIMINATES 3 OUT OF 4 BRAZING JOINTS AND AVOID POTENTIAL CHANCES OF LEAKAGES DUE TO HUMAN ERROR” & ENHANCES VRF AIR-CONDITIONING PIPING CIRCUIT LIFE OF METRO STATIONS, DEPOTS AND BUIDINGS</p>	
<p>We have found the quality of copper tubes satisfactory and meeting the air-conditioning standards.</p>	
<p>M/s. Vallabh Aircon</p> 	

<p>MULTIDEAL CORPORATION AN ISO 9001:2008 CERTIFIED COMPANY TURNKEY ENGINEERS, MACHINERY MERCHANTS & CONSULTANTS</p> <p>AUTHORISED SALES & SERVICE DEALERS/CONTRIBUTORS</p> <p>DAIKIN, GCHERMA, Haier, LG, LAMBERT, MITSUBISHI ELECTRIC, ION EXCHANGE, IFB, Flakt Woods, OSHA, Symphony, ÖSTBERG, Kerulal</p>	
<p>DATE: 07/07/2018</p>	
	
<p><u>TO WHOMSOEVER IT MAY CONCERN</u></p>	
<p>This is to certify that we have procured and installed Mandev Make VRF Grade Copper Tubes for Air-conditioning Application of various sizes for our MAHA METRO NAGPUR Project at Khapri Metro Station & New Airport Metro Station.</p>	
<p>Mandev Tubes “MT ECO FLEX” – (SOFT PANCAKE COIL COPPER TUBE) & “MT ECO SELF CONNECT PLUS +” (ONE END EXPANDED - HALF HARD COPPER TUBE)</p>	
<p>“WHICH ELIMINATES 3 OUT OF 4 BRAZING JOINTS AND AVOID POTENTIAL CHANCES OF LEAKAGES DUE TO HUMAN ERROR” & ENHANCES DAIKIN’S VRV AIR-CONDITIONING PIPING CIRCUIT LIFE OF METRO STATIONS, DEPOTS AND BUIDINGS</p>	
<p>We have found the quality of copper tubes satisfactory and meeting the air-conditioning standards.</p>	
<p>Multideal Corporation</p>  <p>Proprietor</p> <p>M/s. MULTIDEAL CORPORATION, NAGPUR</p>	 <p>NAGPUR METRO RAIL PROJECT</p>

LEADING HVAC INDUSTRY CUSTOMERS




LEADING BUILDERS AND DEVELOPERS



LEADING IT COMPANIES



MEDICAL - GOVT. VENDOR APPROVAL - **U.P. NIRMAN LTD. (UPRRN LTD),** **CENTRAL PUBLIC WORK DEPARTMENT (CPWD)** **FOR AIR CONDITIONING & MEDICAL GRADE COPPER TUBES**



उ.प्र. राजकीय निर्माण निगम लिमिटेड

(जिसे प्रोक्त सरकार का उपक्रम)

विशेषज्ञता केंद्र, विभिन्न चरण, नोमो, नगर, लखनऊ

फोन/एक्स रॉय-2720671, 2720665, 2720670 Fax:2720846

(CIN)-U85320 UP 1975SGC004116

पंजाक- 21/6/2021/24/PPN/23/2

दिनांक 07/11/2021

Project Manager/Add. Project Manager/Unit Incharges,
U.P. Rajkiya Nirman Nigam Ltd.,
Electrical Unit.

Sub.: Approval of MANDEV make copper tubes for Medical Gas Pipeline system and HVAC System.

Dear Sir,

M/s MANDEV Tubes Pvt. Ltd., having an integrated manufacturing unit based in Mumbai (Works : Umbergaon/Gujarat) is an ISO 9001:2008, ISO 14001:2004, 18001:2007 company. M/s MANDEV Tubes Pvt. Ltd. are manufacturing following type of copper tubes :-

- 1 - Medical Grade Copper Tubes for Medical Gas pipeline systems for Hospitals & Medical College site.
- 2 - ACR Grade Copper tubes for VRF, package & Ductable Air conditioning piping circuit for all building projects.

Copper pipes manufactured by M/s MANDEV Tubes Pvt. Ltd. are degreased seamless round copper tubes (Grade : CWD24A/CU-DHP) conforming to EN 13348 : 2008. Firm is manufacturing copper tubes with "One end expanded - MT-MEDI SELF CONNECT PLUS" advantages of which have been explained in Ann-1 (enclosed), which shows this unique design helps eliminate a coupling cost, while joining two tubes and also reduces the installation cost.

MANDEV make copper tubes are hereby approved to be used in various hospitals/Medical College projects being done by Electrical Zone-1.


Yours faithfully,

General Manager(EZ-1)

Encl : As above.


Cc-
1- Managing Director, UPRN Ltd., Lucknow for kind information.
✓ M/s MANDEV tubes Pvt. Ltd., Office 276, Surya Mahal, 2nd Floor, Office No. 82, 155 Road, Mumbai, Maharashtra, 400004 & Unit-1, Plot No. 269, GIDC, Industrial Estate, Umbergaon, Dist.- Valsad, Gujarat, 396171.

General Manager(EZ-1)



सरकार भारत
केन्द्र प्रोक्त विभाग निर्माण
उप. निर्माण निगम लिमिटेड
नगर, लखनऊ
विभाग नगर, नगर, लखनऊ, नगर
फोन- 24655475, 24655476, 24655477
फैक्स- 24655475, 24655476, 24655477

GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT
Office of the Additional Director General
Region Hyderabad
Hyderabad 500005
Email ID: a.d.g.addl@cpwd.gov.in
Telephone No. 24654975, Fax 2462451618



No: 23(2)(3)ADG-RH / CPWD/2021/ 285-92

Dated: 10/02/2021

OFFICE MEMORANDUM

Sub: Approval of Preferred makes for Electrical & Mechanical Items-Reg.

The Additional Director General, Region Hyderabad, CPWD, Hyderabad is pleased to approve the enclosed list containing Preferred makes for Electrical & Mechanical items for use.

1. The above approval is for two years from the date of issue of this office memorandum for future works. The approval will automatically lapse at the end of this period.
2. All CEs and SEs under this jurisdiction of Region Hyderabad and their sub-ordinate offices are requested to incorporate these makes in the NIT to be approved by them for future works.
3. The above approval does not absolve the Executive/ Supervision officers concerned of their responsibility of necessary checks like quality, rate and performance of the products while processing/ using the same. Shortcomings/ deficiencies of serious nature, if observed while in use at site may be brought to the notice of this office immediately.
4. The approval does not make the firms eligible for claiming the right to get the work done or items procured through them only. Work/ Procurement is subject to firm's competitive offers against other competitive manufacturers/brands/suppliers as mentioned in NIT.
5. The performance of the manufacturers/brands/suppliers shall be watched by field unit and report shall be submitted to the approving authority for periodic review.

Additional Director General, Region Hyderabad, CPWD, Hyderabad.

Encl: As above

(B. Sridhar Reddy)
Superintending Engineer (P)


Copy to:

- 1. Special Director General, Project Region, CPWD, Chennai for kind information.
- 2. Chief Engineer-Hyderabad
- 3. Chief Engineer -Vijayawada
- 4. Chief Engineer -Bhubaneswar
- 5. Superintending Engineer-Warangal
- 6. Superintending Engineer -Sambalpur
- 7. SE(Works cum TLQA), O/o ADG, Region Hyderabad
- 8. EE(Hq), O/o ADG, Region Hyderabad to publish in the SR-Website

6. VRF/VRF System		
Sr. No.	Product	Makes
1.	VRV/VRF Indoor and Outdoor AC units	<ul style="list-style-type: none"> O General Mitsubishi Carrier(Thoshiba) Hitachi Daikin Blue Star Volts
2.	Refrigerant pipes	<ul style="list-style-type: none"> Godrej Mehta ✓ Mandev Rajco Nippon Totaline As per manufacturer's standards
3.	UPVC Drain Pipes	<ul style="list-style-type: none"> Sudhakar Aashirwad Astral Supreme Press Fit

MAKES	
18 Horizontal Bed Head Panel	<ul style="list-style-type: none"> Meditek Sonnemed Aktiv Technologies Reanimed(Turkey) Medikraft(India) MDD(India) MPS(India) PES(India) Akive Pushpa Sales Pvt. Ltd(India) G. Samaras S.A (Greece) Beacon Medas Prent World(India)
19 Copper Pipe	<ul style="list-style-type: none"> ✓ Mandev Mehta Metal Alloy Connex Rajco
20 Isolation Valves	<ul style="list-style-type: none"> Meditek Sonnemed Aktiv Technologies RB Italy CIM Italy Reanimed(Turkey) G. Samaras S.A (Greece) Beacon as Prent World(India) Legris(Italy)

MEDICAL - CLIENT TESTIMONIALS - FOR GOVERNMENT & PRIVATE INSTALLATION OF MANDEV MEDICAL GRADE COPPER TUBES



Our: rap/1538-R
Date: 19-05-2016

VENDOR APPROVAL CERTIFICATE

This is to certify that M/s Mandev Tubes Pvt. Ltd., Mumbai having works located at Plot No 269, GIDC Industrial Estate, Opp. Usha Garments, Umbergaon-396171, Dist Valsad, Gujarat State, India are approved supplier of Medical Grade Copper Pipes to our Company.

We are in use of Mandev Medical Grade copper pipes. Several MGPS installations (mentioned below) have been carried out with Medical Grade copper pipes from Mandev Tubes Pvt. Ltd., Mumbai.

Their Medical Grade Copper pipes save three joints out of every four joints. We were able to eliminate number of copper pipe joints at various installation sites.

All straight tubes are Eddy current tested for detecting potential leaks and serious defects like cracks, pin holes or any other defects.

Their product can be identified by the printed marking on straight length tubes. Plastic branded end caps with Mandev tube logo for all straight tubes.

Hologram sticker is also affixed on every straight length tubes as a label of authenticity.

The quality standards and delivery schedules are in line with our expectations.

MGPS INSTALLATION AT FOLLOWING HOSPITALS HAVE BEEN DONE WITH MEDICAL GRADE COPPER PIPES FROM MANDEV TUBES PVT. LTD., MUMBAI



- RAMAKRISHNA MISSION HOSPITAL, ITANAGAR, ARUNACHAL PRADESH - (300 BEDDED GENERAL HOSPITAL) - 2015-16
- EDEN MEDICAL CENTER, DINAPURI, NAGALAND - (120 BEDDED GENERAL HOSPITAL) - 2015.
- MOTHER AND CHILD HOSPITAL, MANGALAI, ASSAM - (100 BEDDED MOTHER & CHILD HOSPITAL) - 2015.
- CHRISTIAN INSTT. OF HEALTH, RESEARCH & SCIENCE, DINAPURI (150 BEDDED GENERAL HOSPITAL) - 2015-16

(Harish Bhar)

For rap Hospitech India Pvt. Ltd.

rap Hospitech India Pvt. Ltd.

Regd Office : A-1108, G.D. Park, New Delhi 110016
Sales Office : A-1108, G.D. Park, New Delhi 110016 Tel: +91 11-68021218 * Fax: +91 11-68021218
Huda 110017 Tel: +91 11-6801558 * 27 25 New Lane, Sakinaka, Gurgaon 122001, Haryana +91 012950130

DATE: 03-02-2023

MANDEV TUBES QUALITY FEEDBACK & APPROVAL CERTIFICATE

This is to certify that, We are purchasing and Installing Mandev Make Medical Grade Copper Tubes, by **M/s Mandev Tubes Pvt. Ltd.**, Plot No.269, G.I.D.C. Industrial Estate Opp. Usha Garments, Umbergaon-396171, Dist: Valsad, Gujarat State, India.

We have used Mandev Tubes Medical Grade Copper Tube:
(MT MEDI SELF CONNECT PLUS+ ONE END EXPANDED COPPER TUBES FOR MEDICAL GAS PIPELINE SYSTEMS .

Sr. No	Hospital Project Site Name & Details	Project Site Location	Project Size (In Tons)
1	Model Hospital ESIC Chandigarh	Ramdarbar, Phase 2, Chandigarh	2
2	Indira Gandhi Medical College and Hospital, Shimla	Snowdown Shimla, H.P.	6
3	Dr. RPGMC, Kangara	Vill. Tanda Distt. Kangra, H.P.	4

Please find below Quality Feedback, Which we experienced, while installation & commissioning on project site:

- The result of the testing was very nice enhanced quality for workmanship, installation & execution of Copper Piping Brazing together in a shorter time span with great craftsmanship in a neat and tidy finish.
- By using ONE END EXPANDED, we can execute our Brazing work faster compared to the conventional practice of doing Brazing, plain Pipe from both end.
- Instead of occupying two close joints of Brazing of coupling, we could get it done with the one end brazing with 3 meter distance. So less chance of leakage due to heat transfer, which is skillfully and with better workmanship.

CONCLUSION:
Mandev Make **MT MEDI SELF CONNECT PLUS +, One End Expanded Medical Grade Copper Tubes, Which Can Save 3 Joints out of Every 4 joints** for Medical Gas Pipeline System (MGPS), this will Enhance life of the Medical Gas Piping System, As well as Take better care for citizen of India.

The Quality standard and delivery schedules are in line with our expectation. The attitudes, approach and services towards the customer are truly professional.

Thanking You,
For ANK Services

Vikaas Gupta
CEO

B-42, Sector-2,
new Shimla, Shimla H.P.
Email: ankyservices@gmail.com



Srishty Medical Private Limited

Formerly known as Srishty Udyog Pvt Ltd

Brands:
MEDITEK Srishty HIMALYAN SunMeditek

Date : 31.01.2023 Ref # SNG : SMPL : MT : MUMBAI : 310123

To
Mandev Tubes Pvt. Ltd.
Mumbai

Respected Sir/Madam,

Please find below the list of Reputed Hospitals where we have installed Mandev Copper Tubes (Medical Grade):

S. No.	Name of the Hospitals	Location
1.	PSG Hospital	Coimbatore
2.	District Hospital	Odisha
3.	Sanjay Gandhi Memorial Hospital	Delhi
4.	Baba Saheb Ambedkar Hospital	Delhi
5.	Rao Tula Ram Hospital	Delhi
6.	Sancheti Hospital	Pune
7.	MED11	Srinagar
8.	ESIC Hospital	Vishakhapatnam
9.	Sri Vasudevaperumal Healthcare	Thanjavur
10.	Guru Gobind Singh Govt. Hospital	Delhi
Etc.		

Kindly provide the Test Certificates along with Lloyd Certificates.

Thanking you,
Yours Sincerely,

For Srishty Medicals Pvt. Ltd.



Srishty Medical Private Limited
A219 Road No 6
Mangalpur NH
New Delhi 110037
INDIA

+91 112678 76886
Mob: +91 96100 07700
Email: sng@mgpindia.org
website: www.sngindia.org

CIN No. U74899DL1982PTC013620
VAT/TIN/NCST No. 07860130071
PAN No. AABC88403K
IEC Code 0502051906
Service Tax No. AABC88403KSD001



KARNATAKA INSTITUTE OF MEDICAL SCIENCES, HUBLI-580022.

Ph : (0)0836-2373348 Fax : 0836-2373724

No.KIMS/MS/ 404/2020-2021 Date : 04.04.2020

To,
MANDEV TUBES PVT. LTD.
Plot No.269, G.I.D.C.,
Umbergaon,
Dist. Valsad - 396 171 (GUJARAT)

Dear Sir,

We are in the process of constructing Isolation and Emergency Wards in our Hospitals in Karnataka state.

M/s Jumbo Medical Technologies, Hubli, have been awarded the project execution by us.

You are requested to supply the required Copper Tubes, Copper Fittings with other accessories on extremely urgent basis to our vendor M/s Jumbo Medical Technologies, Hubli - 580020.

We need your co-operation to fight the COVID - 19 Epidemic diseases.

Yours faithfully,

Medical Superintendent
Karnataka Institute of Medical
Sciences Hospital, HUBLI.

MEDICAL CASE STUDY

HOW TO AVOID COUPLING & SAVE COST

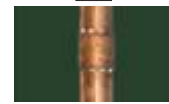
SAVING BY INSTALLING MT - MEDI SELF CONNECT PLUS +, VERSION II, WITH BRAZING RING BY SKIPPING OF COUPLING



Skip Use of
Coupling



To Save 1 joint Out of
2 joints



Two sided Brazed
Coupling joint
Installation



One sided Brazed
Expanded
Tube joint Installation

PRODUCT USP - ENHANCE QUALITY AND SAVING IN COST OF CENTRALISED MEDICAL GAS PIPELINE SYSTEM (MGPS) COPPER TUBE FOR HOSPITAL PROJECTS FOR MANDEV MAKE V/S OTHER MAKES FOR 1002 MTRS / 360.720 Kgs.

NOTE :- AS YOU SKIP COUPLING AND WHEN YOU INSTALL MANDEV MAKE ONE END EXPANDED - " MT - MEDI SELF CONNECT PLUS+, VERSION II, WITH BRAZING RING" SAVE 50% JOINTS IN INSTALLATION AND COMMISSIONING @ EXTRA COST OF 2.32% PER MTR OF COPPER TUBES.

SR. NO.		PARTICULAR	OTHER MAKE	MANDEV MAKE
1		SR. No	1	2
2		Diameter Size	15 MM	15 MM
3		Wall Thickness	0.9 MM	0.9 MM
4		Weight Per Mtr.	0.360	0.360
COST COMPARI- SION OF COPPER TUBES	5	Copper Tube Rate Per Kgs. (As on 01/08/2023) 100% PAYMENT AGAINST PROFORMA INVOICE	810.000	860.000
	6	Copper Tube Rate Per Mtr.[Sr. No. 4 x 5 = 6]	291.60	309.60
COST V/S QUALITY V/S TIME FOR MANDEV MAKE V/S OTHER MAKE ↓ FOR INSTALL- TION & COMMISS- IONING	7	Copper Tube Requirement in KG for Medical Grade Copper Tubes	360.720	360.720
	8	Copper Pipe Requirement in Mtr. [Sr. No. 7/4 = 8]	1002	1002
	9	Standard Length of Copper Tube in Mtr.	3	3
	10	Copper Tube in Nos. [Sr. No. 8/9 = 10]	334	334
	11	Assuming 2/3 Nos. of Tube [Sr. No. 10] need Coupling Requirement for other Make	222	0
	12	Coupling Cost Per Piece	11.00	0.00
	13	Total Cost of Copper Couplings [Sr. No. 11 x 12 = 13]	2442.00	0.00
	14	Two Side Brazing Cost of Two Side Brazing of Coupling Per Piece.	60.00	30.00
	15	Total Cost of Brazing for Two Side of Coupling for other approved make V/s One Side Of One End Expanded with Pre Inserted Brazing for Mandev Make [Sr. No. 11 X 14 = 15]	13320	6660
	16	Total Cost [Sr. No. (5 x 7) + 13 + 15 = 16]	307945	316879
	17	Copper Tube Rate Per Mtr. (Including Brazing cost with Coupling for other make V/s with One End Expanded with Pre Inserted Brazing Ring for Mandev Make [Sr. 16/8=17]	307.33	316.25
	18	NET SAVING / EXTRA COST PER Mtr. in Percentage (%)	0.00%	-2.82%
19	Actual in Percentage (%) SAVING / EXTRA COST FOR MANDEV MAKE	{ EXTRA COST :- (-2.82%) EXTRA COST (+ 0.5%) SAVING IN NITROGEN = (-2.32) TOTAL EXTRA COST PER MTR.		
20	No of Joints	444	222	
21	No of Joints Saved	0	222	
22	Percentage (%) of Joints Saved	0.00%	50.00%	
23	Actual RMT of Copper Tube Requirement (Sr. No. 8 for 1 Diameter 15 mm)	1002 { 1) COMPLETE MEDICAL PIPING CIRCUIT FOR HOSPITAL PROJECT 2) TOTAL QUANTITY IN MTRS }		
24	Actual Nos. of Joints Saved (Sr. No. 21 for 1 Diameter 15 mm)	222 { SAVINGS OF TOTAL NOS OF BRAZING JOINTS FOR HOSPITAL PROJECT }		
25	For Length of every 9 running Mtr. Medical Grade Copper Tubes [MGPS] [Sr. No. 23/24 = 25]	Save 1 Joint, By Installing Mandev Make - MT - MEDI SELF CONNECT PLUS +, VERSION II, WITH BRAZING RING (One End Expanded Copper Tubes with Pre Inserted Brazing Ring)		
26	Conclusion	Sr. No. 23, In Length Of 1002 Mtr. Medical Gas Pipeline Systems (MGPS) Circuit For Hospital Projects, 222 Nos. Of Joints Are Saved. So, In Every 4.5 Mtr Length 1 Joint Gets Eliminated And Field Failure Due To Human Error In Brazing Is Removed For 222 joints.		
EVERY 4.5 Mtr	1002 Mtr / 222 Nos. SAVE BRAZING JOINTS = 4.5 Mtr (15 Feet)			

Sales Office : 706, Lodha Supremus, 7th Floor, Senapati Bapat Marg, Railway Colony, Lower Parel, Mumbai - 400013, Tel.: +91-22-66131818 Website : www.mandevtubes.com

MEDICAL CASE STUDY

HOW TO AVOID ELBOW & SAVE COST

SAVING BY INSTALLING MT - MEDI SELF CONNECT PLUS +, VERSION II, WITH BRAZING RING BY SKIPPING OF ELBOW



MANDEV TUBES

Skip use of Elbow



To Save 2 Joints

☒



2 Sided Brazed Elbow
Joint Installation

☒



No joint, No Brazing
Installation

PRODUCT USP - ENHANCE QUALITY AND SAVING IN COST OF CENTRALISED MEDICAL GAS PIPE LINE SYSTEM (MGPS) COPPER TUBE FOR HOSPITAL PROJECTS FOR MANDEV MAKE V/S OTHER MAKES FOR 1002 MTRS / 360.720 Kgs.

NOTE :- AS YOU SKIP ELBOW AND WHEN YOU INSTALL MANDEV MAKE ONE END EXPANDED - MT MEDI SELF CONNECT PLUS+, VERSION II, WITH BRAZING RING, SAVE 100% JOINTS IN INSTALLATION AND COMMISSIONING @ EXTRA COST OF 2.62% PER MTR OF COPPER TUBES.

NOTE :- IF YOU DO BENDING OF HALF HARD COPPER TUBE ON SITE, THERE WILL BE NO CHARGES FOR BRAZING AND JOINING ELBOWS WITH TUBES.

NOTE:- ONLY ONE TIME FOR BENDING WILL BE SPENT ON MECHANICAL BENDER. (ONE TIME INVESTMENT FOR BENDER.)
BENDER AVAILABLE IN MARKET UPTO 35 MM.)

SR. NO.		PARTICULAR	OTHER MAKE	MANDEV MAKE
1		SR. NO.	1	2
2		Diameter Size	15 MM	15 MM
3		Wall Thickness	0.9 MM	0.9 MM
4		Weight Per Mtr.	0.360	0.360
COST COMPARI- SION OF COPPER TUBES	5	Copper Tube Rate Per Kgs. (As on 01/08/2023) 100% PAYMENT AGAINST PROFORMA INVOICE	810.000	860.000
	6	Copper Tube Rate Per Mtr. [Sr.. No. 4 x 5 = 6]	291.60	309.60
COST V/S QUALITY V/S TIME FOR MANDEV MAKE V/S OTHER MAKE ↓ FOR INSTALL- TION & COMMISS- IONING	7	Copper Tube Requirement in KG for Medical Grade Copper Tubes	360.720	360.720
	8	Copper Pipe Requirement in Mtr. [Sr. No. 7/4 = 8]	1002	1002
	9	Standard Length of Copper Tube in Mtr.	3	3
	10	Copper Tube in Nos. [Sr. No.8/9 = 10]	334	334
	11	Assuming 1/3 Nos. of Tube [Sr. No. 10] need Elbow Requirement for other Make	110	0
	12	Elbow Cost Per Piece	16.00	0.00
	13	Total Cost of Elbow V/s No Cost of Elbow [Sr. No. 11 x 12 = 13]	1760.00	0.00
	14	Two Side Brazing Cost of Copper Elbow per Piece	60.00	0.00
	15	Total of Cost of Two Side Brazing of Elbow [Sr. No. 11 x 14 = 15]	6600	0
	16	Total Cost [Sr. No. (5 x 7) + 13 + 15 = 16]	300543	310219
	17	Copper Tube Rate Per Mtr. (Including Brazing cost with Coupling for other make V/s One End Expanded with Pre Inserted Brazing Ring for Mandev Make.	299.94	309.60
	18	NET SAVING / EXTRA COST PER Mtr. in Percentage (%)	0.00%	-3.12%
19	Actual in Percentage (%) SAVING / EXTRA COST FOR MANDEV MAKE	{ EXTRA COST :- (-3.12%) EXTRA COST (+ 0.5%) SAVING IN NITROGEN = (-2.62) EXTRA COST PER MTR. }		
20	No of Joints	220	0	
21		No of Joints Saved	0	220
22		Percentage (%) of Joints Saved	0.00%	100.00%
23		Actual RMT of Copper Pipe Requirement (Sr. No. 8 for 1 Diameter 15 mm)	1002 { 1) COMPLETE MEDICAL PIPING CIRCUIT FOR HOSPITAL PROJECT 2) TOTAL QUANTITY IN MTRS }	
24		Actual Nos. of Joints Saved (Sr. No. 21 for 1 Diameter 15 mm)	220 { SAVINGS OF TOTAL NOS OF BRAZING JOINTS FOR HOSPITAL PROJECT }	
25		For Length of every 4.5 running Mtr. MGPS Piping Circuit [Sr. No. 23/24 = 25]	Save 2 Joints, By Installing Mandev Make - MT MEDI SELF CONNECT PLUS+, VERSION II, WITH BRAZING RING (One End Expanded Copper Tubes with Pre Inserted Brazing Ring)	
26		Conclusion	Sr. No. 23, In Length Of 1002 Mtr. Air-Conditioning Tubing Circuit In Building Projects, 220 Nos. Of Joints Are Saved. So, In Every 4.5 Mtr Length 1 Joint Gets Eliminated And Field Failure Due To Human Error In Brazing Is Removed For 220 Joints.	
EVERY 4.5 Mtr & 2.3 Mtr	{	1002 Mtr / 220 Nos. SAVE BRAZING JOINTS = 4.5 Mtr / 15 Feet, SAVE 1 BRAZING JOINT		
		So, 1002 Mtr/442Nos. (222 Nos Coupling Joints + 220 Nos Elbow Joints) SAVE BRAZING JOINTS = 2.3 Mtr / 7.5 Feet		
Sales Office : 706, Lodha Supremus, 7th Floor, Senapati Bapat Marg, Railway Colony, Lower Parel, Mumbai - 400013, Tel.: +91-22-66131818 Website : www.mandevtubes.com				

*

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MANDEV TUBES

WHY? WHY? WHY?



- WHY USE COUPLING OR ELBOWS WHEN IT CAN BE AVOIDED?
- WHY WANT MORE NO OF JOINTS IN THE PIPING CIRCUIT AND WEAKEN IT?
- WHY USE THE CONVENTIONAL METHOD FOR JOINING TWO PIPES?
- WHY WOULD YOU PROMOTE SOMETHING THAT IS NOT ENHANCING QUALITY AND SAVING TIME DURING INSTALLATION?
- WHY NOT WANT TO MOVE TOWARDS AN INNOVATIVE, COST SAVING AND TECHNICALLY PROVEN PRODUCT?

**MANDEV HELPS YOU
ACHIEVE THIS WITH NO EXTRA EFFORT OR COST.
WE BELIEVE IN DELIVERING QUALITY DO YOU...!!!**

Our Associations Membership & Certification



ISO - 9001
ISO - 14001
ISO - 45001



ISO 7396-1
CE Mark And
GREENPRO

MANDEV TUBES PVT LTD.

706, 7th FLOOR, LODHA SUPREMUS, SENAPATI BAPAT MARG, RAILWAY COLONY,
LOWER PAREL, MUMBAI - 400 013.

Customer Care No. : 022 66131818 (Riya) ~ : 6351384180

Email : adityamantubes@gmail.com / rrc@mandevtubes.com ~ Website : www.mandevtubes.com

AWAITING DEALERSHIP ENQUIRIES FOR
MADHYA PRADESH, MAHARASHTRA, PUNJAB, ODISHA, UTTAR PRADESH, AND NORTH EASTERN STATES