| Material available as per required specification | | | | | | |
|---|---|---|---|---|---|---|
| **S.No.** | **Size (mm)** | **Thickness of Available Material (SWG)** | **Client (Required Thickness ) (SWG)** | **Rate (Rs/Kg)** | **Type** | **Remarks** |
| 1 | 6.4 | 21 | 21 | 912 | Soft | Rajco |
| 2 | 9.5 | 21 | 21 | 912 | Soft | Rajco |
| 3 | 12.7 | 21 | 21 | 912 | Soft | Rajco |
| 4 | 15.9 | 19 | 19 | 912 | Soft | Rajco |
| 5 | 19.1 | 19 | 19 | 912 | Soft | Rajco |
| 6 | 25.4 | 19 | 19 | 912 | Hard | Rajco |
| 7 | 28.6 | 19 | 19 | 912 | Hard | Rajco |
| 8 | 31.8 | 18.5 | 18.5 | 912 | Hard | Rajco |
| 9 | 38.1 | 17.5 | 17.5 | 912 | Hard | Rajco |

| Material not available | | | | | | |
|---|---|---|---|---|---|---|
| **S.No.** | **Size (mm)** | **Thickness of Available Material (SWG)** | **Client (Required Thickness ) (SWG)** | **Rate (Rs/Kg)** | **Type** | **Remarks** |
| 1 | 44.4 | 17 | Not Available | | | |
| 2 | 50.8 | 17 | Not Available | | | |

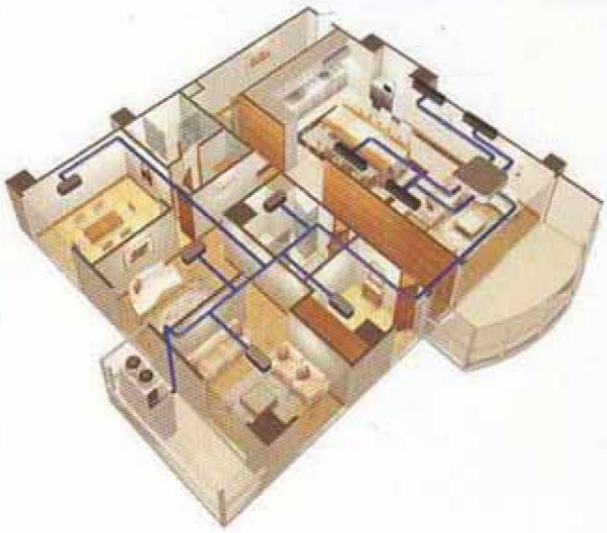
| Material available but not matching specs | | | | | | |
|---|---|---|---|---|---|---|
| **S.No.** | **Size (mm)** | **Thickness of Available Material (SWG)** | **Client (Required Thickness ) (SWG)** | **Rate (Rs/Kg)** | **Type** | **Remarks** |
| 1 | 22.2 | 21 | 19 | 912 | Hard | Attached is standard specification chart of Rajco for copper pipes |

| **S.No.** | **Size (mm)** | **Thickness of Available Material (SWG)** | **Client (Required Thickness ) (SWG)** | **Elbow Rate (Rs/nos)** | **Socket Rate (Rs/nos)** | **Remarks** |
|---|---|---|---|---|---|---|
| 1 | 22.2 | 16 | | 80 | 60 | |
| 2 | 25.4 | 16 | | 120 | 80 | |
| 3 | 28.6 | 16 | | 120 | 80 | |
| 4 | 31.8 | 16 | | 160 | 110 | |
| 5 | 38.1 | 16 | | 200 | 130 | |

# RAJCO DHP Grade Copper Tubes for VRF / VRV
# Recommended Sizes & Working Pressure

| TUBE OD | | Wall Thickness | | Temper | Design Pressure | Weight | Working Pressure |
|---|---|---|---|---|---|---|---|
| Inch | mm | mm | swg | | N/mm$^2$) | kg/mt | (kg/cm$^2$ or Bar) |
| 1/4" | 6.35 | 0.80 | 21 | Soft | 46.00 | 0.125 | 132.6 |
| 3/8" | 9.53 | 0.80 | 21 | Soft | 46.00 | 0.196 | 84.3 |
| 1/2" | 12.70 | 0.80 | 21 | Soft | 46.00 | 0.268 | 61.8 |
| 5/8" | 15.88 | 0.99 | 19 | Soft | 46.00 | 0.414 | 61.2 |
| 3/4" | 19.05 | 0.99 | 19 | Soft | 46.00 | 0.507 | 51.0 |
| 3/4" | 19.05 | 0.80 | 21 | Hard | 72.50 | 0.410 | 63.6 |
| 7/8" | 22.22 | 0.80 | 21 | Hard | 72.50 | 0.482 | 54.2 |
| 1" | 25.40 | 0.88 | 20.5 | Hard | 72.50 | 0.607 | 52.0 |
| 1 1/8" | 28.58 | 0.99 | 19 | Hard | 72.50 | 0.768 | 52.0 |
| 1 1/4" | 31.75 | 1.10 | 18.5 | Hard | 72.50 | 0.948 | 52.0 |
| 1 3/8" | 34.93 | 1.21 | 18 | Hard | 72.50 | 1.147 | 52.0 |
| 1 1/2" | 38.10 | 1.32 | 17.5 | Hard | 72.50 | 1.365 | 52.0 |
| 1 5/8" | 41.28 | 1.43 | 17 | Hard | 72.50 | 1.602 | 52.0 |

Note: Size to be changed as per client / manufacturer's specification & wall thickness requirements. Rajco can offer all sizes as required



**Sketch of VRV / VRF installation with main compressor out side & copper tubes (blue) running to each room**

t = Minimum Wall thickness (mm)

p = Max. Working Pressure (bar)

(0.1 N / mm2 = 1 Bar = 14.5 psi)

D = Max. Outer Diameter (mm)

f = Design Stress

= 46 N / mm2 for Annealed pipes - O

= 60 N / mm2 for Half Hard pipes - 1/2H

= 72.5 N / mm2 for Hard pipes - H

## Min. Wall Thickness / Max. Working Pressure Calculations

If maximum working pressure is known & to calculate minimum wall thickness:

$$t = pD/(2f + p)$$

If minimum wall thickness is known & to calculate maximum working pressure:

$$p = 2f\,t / (D - t)$$

Note: Wall thickness figure is the MINIMUM value. Ideally, this value should be adjusted by a safety factor which would depend upon the design engineer. The value of pressure should be increased by the desired safety factor – say 50% and then wall thickness required recalculated.


**Rajco Metal Industries Pvt. Ltd.**
Opp. Acme Industrial Estate, Sewri Bunder Road,
Sewri (East), Mumbai 400 015, India.
Tel : 91 22 2416 6706 / 2418 1856 / 2412 1804
Fax : 91 22 2416 6426
Email : rajco@rajcogroup.com
Website : www.rajcogroup.com

*Universal Sales Company*
*4, Chandney Chowk Street,*
*Kolkata - 700 072*
**Email ID: sales@universalHVAC.in**
**+91-33-22127247 / 9331015868**
**Authorized Distributors Eastern India**