



PT™

84 4th Street, Suite 1, Honesdale, PA 18431, USA
www.PTubes.us, Info@PTubesInc.com, tel. (+1) 570 616 7818, efax (+1) 201 817 1366

PT™ is the creator of

RYNO® LINESETS

PT™ is a Feinrohren S.p.A. Company



§ Table of Content

§ Table of Content.....2
§ Capillary and precision tube AST B360 (2015).....3
§ RYNO® Seamless ASTM B280 and ASTM B1003 Copper Pipe Refrigeration Coils4
§ RYNO® LineSets.....5
 §§ Polyethylene Foam Insulation.....5
 §§ Outer Jacket.....5
 §§ Insulation R Value.....6
 §§ Brass 45° Flare Fittings and Plugs.....6
 §§ Packaging details.....8
 §§ Handling.....9
§ Key References.....10
§ Important note.....11

§ Capillary and precision tube ASTM B360 (2015)

Capillary is manufactured at plant of Lumezzane - Italy.

Capillary tubes are available naked, tin-plated, zinc-plated or coated in PE/PVC.

They are provided in coils up to 300 kg, or in hard, half-hard or annealed, straight length of various sizes. Capillary tubes are manufactured in accordance with standards ASTM B 360 (2015) and customer specifications. ASTM B 360 (2015) indicates that the tubes shall be furnished in the H80 (hard drawn) condition.

Coils of various lengths, individually, packed in PE bags, are available for the retail market.

§ RYNO® Seamless ASTM B280 and ASTM B1003 Copper Pipe Refrigeration Coils

Copper Grade. Material is made from copper in compliance with ASTM B75 and of UNS C12200 grade; it is 99,9% pure copper.

Annealing. 060 (soft annealed) according Classification B601.

Grain Size. Between 0.030 mm and 0.070 mm, according Test method E112

All copper pipe is manufactured in Italy from pure mineral, not using scraps.

Ends are:

- + capped if product comes as bare copper RYNO® Seamless ASTM B280 Copper Pipe Refrigeration Coils
- + crimped if product come as RYNO® lineset.

Suitable for R-410A.

Pressure rating. 700 psi according ASTM B1003 and UL 207.

Product Marking. it is Permanently incised. Marking is likewise following one:
<<RYNO® Feinrohren ACR OD ASTM B280>>

Important note.

ASTM B280 and ASTM B1003 are mandatory, including thickness fulfillment and incision requirements, according to:

- + International Building and Mechanical Code (see paragraph 1107.5.3);
- + California Title 24 (see paragraph 1109.1.1) and ASME 31.05-2016 (see table 523.1, page 51)
- + IAPMO UMV

§ RYNO® LineSets

§§ Polyethylene Foam Insulation

Polyethylene foam assures thermal insulation from surroundings.

- + polyethylene foam: the insulation coating is a low density closed cells polyethylene foam, CFC and HCFC damaging-ozone gas free; product is made according to ASTM C 1427-07, type I (tubular), grade I (insulation material for use on typical commercial system non-crosslinked).
- + thermal conductivity: 0,038 W/mK at 40°C (0.263 Btu in/sq.ft.°F h at 104°F) according to ISO EN 8497 and likewise to ASTM C 335-95.
- + moisture diffusion coefficient: $\mu = 5297$ according to EN 13469 and likewise to ASTM E 96-00.
- + working temperature: polyethylene foam is suitable for technical applications included in a range temperature from -101°C up to 93°C (-150°F up to 200°F) according to ASTM C 1427-07, type I (tubular), grade I (non-crosslinked). - average bulk density: 30 kg/m³ (1,87 lb/ft³)
- + surface covering: polyethylene skin repair foam insulation from scratches;
- + colors: WHITE (white foam + white skin) or BLACK (black or dark gray foam + black skin)
- + wall thickness: 1/2 in., 3/4 in., 1 in.
- + surface burning characteristics:
 - ++ UL 94, HBF foam test, foam tested; suitable for vertical application too.
 - ++ UL 723 - ASTM E84 (25/50): Flame Spread Index less than 25 and Smoke Development Index less than 50 as tested according to UL 723;
 - ++ ULC S102.2 2 25/50
- + corrosion proof: no need to seal ends and it releases less chemicals than any rubber foam in harsh conditions.

Important notes.

Insulation dimensions and thickness values are nominal ones; insulation dimensions and thickness have a tolerance due to manufacturing process and packaging; installation of RYNO® SINGLE per-insulated, 3/4 in and 7/8 in diameter requires a professional and skilled installer; the insulation is a product subjected to crushing and shrinking; the installer has to verify that the insulation thickness complies with the required International Code applications; 1 ft. distance printed on insulation is approximate, copper tube has a length non inferior than nominal one.

§§ Outer Jacket

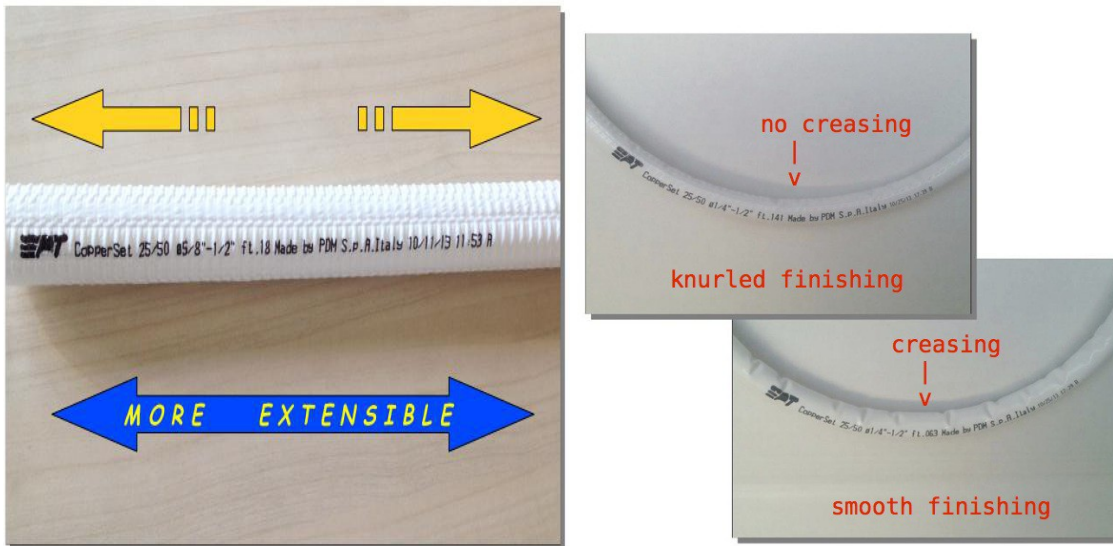
Marking. Marking is likewise following ones:

- ++ white, foam 1/2 in. WT, tube OD 1/4 in up to 7/8 in:
- <<"PT logo" RYNO R value - 25/50 - Ø1/4 in. x 1/2 in. ft.NNN date time shift>>
- ++ white, foam 1/2 in. WT, tube OD 1-1/8 in:
- <<1-1/8 WT 1/2 25/50>>
- ++ white, foam 3/4 in. WT and 1 in. WT, tube OD 1/4 in up to 1-1/8 in:
- <<OD WT 1/2 25/50>>
- ++ black, not marked

Outer Finishing. The KNURLED FINISHING avoids the creases due to the bending that you can see in case of SMOOTH FINISHING; the KNURLED FINISHING is more extensible; therefore it's more resistant with tearing

Finishing on different product lines:

- + white or black, foam 1/2 in. WT, tube OD 1/4 in. up to 7/8 in.: knurled.
- + white or black, foam 1/2 in. WT, tube OD 1-1/8 in.: spotted or pyramidal (lighter than knurled);
- + white or black, foam 3/4 in. WT and 1 in. WT, tube OD 1/4 in. up to 1-1/8 in.: spotted or pyramidal (lighter than knurled).



UV and weather resistance. Product is design to resist from 3 up to 5 years. Standards reference are ASTM G153 and ASTM G90

Important note.

UV exposure may vary substantially.

Life cycle of the copper (minimum 10 years) is much longer than the coating.

International Code requires protection for piping exposed in exterior.

Decision on covering the pipe is on Customer's sole discretion and liability.

§§ Insulation R Value

Copper nominal diameter (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1-1/8
Insulation nominal thickness (in.)	1/2	1/2	1/2	1/2	1/2	1/2	1/2
R value	4	3	3	3	3	3	3
Insulation nominal thickness (in.)	3/4	3/4	3/4	3/4	3/4	3/4	3/4
R value	7	6	5	5	5	5	4
Insulation nominal thickness (in.)	1	1	1	1	1	1	1
R value	10	9	8	7	7	7	6

§§ Brass 45° Flare Fittings and Plugs

Brass 45° Flare Fittings are manufactured in Italy.

Recommended maximum working pressure: 48 bar = 700 psi.

According to:

+ SAE J513,

+ Military Standards MS-35867 through MS35873 inclusive MS-35919, MS-24815 and MS-16993

Fabricated from brass forging eliminating the possibility of seepage by porosity.

Smooth interior finish provides unrestricted flow and reduced pressure drop.

Suitable for refrigerants: HCFC, HFC, HC and R744(CO₂). NOT for ammonia (NH₃).

Guarantee refrigerant loss lower than 0,1 g/year = 1,54 grains/year.

Cat. no.	Nominal Tube Diameter	Nominal Flare Size SAE J513	Threat ANSI/ASME B1.1		Tightening Torque Range			
	in.	in.	in.	Threat	Nm	Nm	ft. lbs.	ft. lbs.
NS4-4	1/4	1/4	7/16	20 UNF	11	14	8,11	10,32
NS4-6	3/8	3/8	5/8	18 UNF	20	25	14,74	18,43
NS4-8	1/2	1/2	3/4	16 UNF	34	47	25,06	34,64
NS4-10	5/8	5/8	7/8	14 UNF	54	75	39,8	55,28

Threaded Plastic Plugs are knurled for easy use in manual assembly and removal.

Protects threaded fittings from moisture, dust and damage during production, shipping and storage. Designed to work in low-pressure testing requirements.

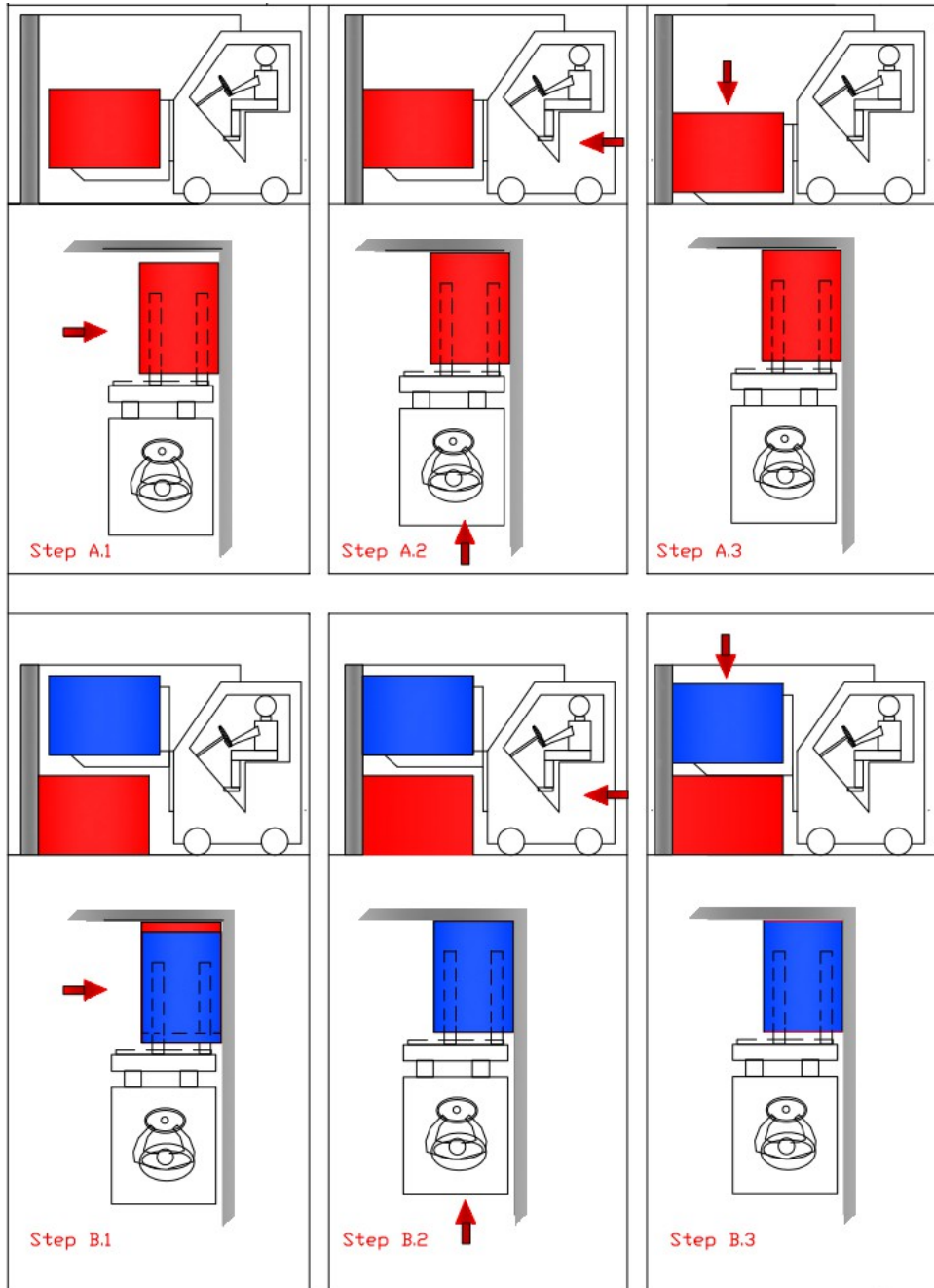
Important note.

The installer has to verify that HVAC machine specs before installing the product.

§§ Packaging details

- + plastic bag per each coil or lineset;
- + label per each plastic bag;
- Ends are crimped if product come as RYNO™ line-set.
Crimped is now shorter than ever: it reduces cutting risk and it is possible to use every inch of Your copper pipe.
- + Limit Stackable by two;
- + Quality Check data sheet per each carton;
- + coils are packaged in closed cartons to prevent any INVENTORY SHRINKING;
- + wood pallet nominal dimension: 32 in. x 64 in. x 5,5 in. or 29-1/2 in. x 59 in. x 5.5 in.;
- + pallet is 2 side fork-liftable;
- + carton nominal dimension: 32 in. x 32 in. x 41 in. (height) or 29-1/2 in. x 29-1/2 in. x 41 in (height);
- + cartons + pallet dimensions: 32 in. x 64 in. x 46.5 in. (height) or 29-1/2 in. x 59 in. x 46.5 in. (height);
- + 2 labels per each carton; 4 labels per each pallet;

§§ Handling



§ Key References

ASTM B360, Hard-Drawn Copper Capillary Tube for Restrictor Applications
ASTM B1003 Seamless Copper tube for Linesets
ASTM B280 Seamless Copper Tube
ASTM B75 99.9% Pure Copper
C12200 Seamless Copper Tube for Air Conditioning and Refrigeration
UL 207 Pressure rating - 700 psi
International Building Code
International Mechanical Code
International Energy Code
California Title 24
ASME B31.5
UL 94, HBF foam test, foam tested; suitable for vertical application too.
UL 723 - ASTM E84 (25/50)
ULC S102.2 (25/50)
ASTM G153 and ASTM G90

§ Important note

Official Technical Data sheet document is only that one in English version.

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