

O'Neill Walsh Community Builders

Submittal Form

OWCB

AHSC

(Project)

Submittal No. 001

Description: Refrigerant Piping System

Date: 10/27/17 Return By: 11/10/17

Division: 23

Section: 23 23 00

Andersen

Subcontract/Supplier:

The review by O'Neill Walsh Community Builders ("OWCB") of the above Submittal shall not relieve Subcontractor/Supplier from any of its obligations under the agreement with OWCB nor give rise to any claim in favor of the Subcontractor/Supplier or third parties against OWCB or Owner.

By: Logan Bright

O'Neill Walsh Community Builders

Notes:

ARCHITECT

Notes:

ENGINEER

Make Revision noted. No resubmittal required.

Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contact documents. Any action shown is subject to the requirements of the plans and specifications. Contractor is responsible for: Dimensions, which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and the satisfactory performance of his work.

MPFA, Inc. Consulting Engineers

By: Takako Baker, Date:11/11/17

Notes:

HVAC Submittals

**Yakima Clinic
9005 SE Foster Rd.
Portland, OR 97203**

**Submitted To:
O'Neill / Walsh Community Builders
2905 SW First Ave
Portland, OR 97201**

**Submitted By:
Andersen Mechanical
16285 SW 85th Ave, Suite 410
Tigard, OR 97224**



23_23_00

Refrigerant Piping System



100% MADE IN THE USA

GelCopper™ PREINSULATED COPPER ROLL

APPLICATIONS

Individual preinsulated rolls that perfectly fits every air conditioning, such as ductless mini-splits, VRF, heat pumps and unitary systems. Available in 50 ft and 164 ft with 1/2", 3/4" or 1" insulation thickness. All rolls are marked by the foot for proper line charging and maximum waste reduction.

TECHNICAL SPECS

INSULATION

Polyethylene closed cell foam: assures thermal insulation from surroundings

ASTM C 1427-07 compliant

Type I (tubular)

Grade I (insulation material for use on typical commercial system non-crosslinked)

Low-density polyethylene foam: closed cells foam, CFC and HCFC gas free

Water vapor permeability: ASTM E96-00 compliant

Working temperature: ASTM C 1427-07 compliant

Wall thickness: 1/2", 3/4" and 1"

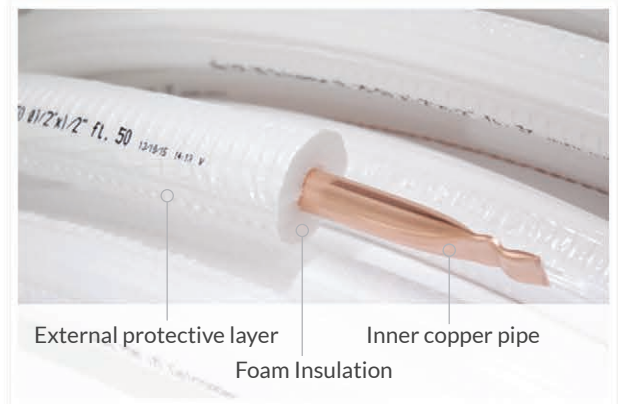
Surface burning characteristics: UL 94, top rated – UL 723, ASTM E84 (25/50) compliant, flame and Spread Index less than 25 and Smoke Development Index less than 50 as tested according to UL 723

R-Value: between 9.0 and 4.0 (depending on pipe diameter and insulation thickness)

COPPER

Pipes: Manufactured according to ASTM B280

Copper: No. C122200 DHP (phosphorous deoxidized, high residual phosphorous), 99.90%



External protective layer

Inner copper pipe

Foam Insulation

SPECIAL FEATURES

Outer Jacket: additional white polyethylene jacket cover protects foam insulation from tearing during installation process

Marking: insulation incrementally marked by every foot to ensure accurate initial unit charge

R410a approved: Gelcopper can be used in applications where high-pressure gases are used as refrigeration source

UV resistant: Gelcopper is UV resistant

Paintable: the insulation can be painted to match the surroundings

PDM US recommends product installation under plastic duct to protect it from severe weather conditions, accidental damages or theft.



100% MADE IN THE USA

GelCopper™ PREINSULATED COPPER ROLL

TRY IT, LOVE IT.

PRODUCT TABLE

PDM US PART NUMBER	COIL SIZE	INSULATION	COILS (per pallet)	LENGTH (of coils)
F100.GUS145012	1/4	1/2	26	50 FT
F100.GUS385012	3/8	1/2	22	50 FT
F100.GUS125012	1/2	1/2	20	50 FT
F100.GUS585012	5/8	1/2	14	50 FT
F100.GUS345012	3/4	1/2	14	50 FT
F100.GUS785012	7/8	1/2	14	50 FT
F100.GUS1185012 NEW!	1-1/8	1/2	6	50 FT
F100.GUS1416412	1/4	1/2	10	164 FT
F100.GUS3816412	3/8	1/2	8	164 FT
F100.GUS1216412	1/2	1/2	8	164 FT
F100.GUS5816412	5/8	1/2	6	164 FT
F100.GUS348212	3/4	1/2	10	82 FT
F100.GUS788212	7/8	1/2	10	82 FT
F100.GUS145034	1/4	3/4	14	50 FT
F100.GUS385034	3/8	3/4	14	50 FT
F100.GUS125034	1/2	3/4	12	50 FT
F100.GUS585034	5/8	3/4	12	50 FT
F100.GUS345034	3/4	3/4	10	50 FT
F100.GUS785034	7/8	3/4	10	50 FT
F100.GUS1450100 NEW!	1/4	1	12	50 FT
F100.GUS3850100 NEW!	3/8	1	12	50 FT
F100.GUS1250100 NEW!	1/2	1	10	50 FT
F100.GUS5850100 NEW!	5/8	1	10	50 FT
F100.GUS3450100 NEW!	3/4	1	8	50 FT
F100.GUS7850100 NEW!	7/8	1	8	50 FT

Streamline®

Tube • Fittings • Valves

THE BEST FITTINGS IN THE JOINT.™

The internal working pressures of R410A and Sub-Critical CO2 can be up to 60% higher than R-22. Trust in the quality and performance of a known leader. In fact, Streamline® Copper Fittings from Mueller Industries are the first fittings on the market to be UL Recognized to 700 PSI.

Streamline®

Other Manufacturer

State of the art manufacturing provides consistent wall thickness. Meets ASME B16.22 standard.

Manufacturer mark stamped on every fitting for easy identification.

Cup depths are manufactured to strict tolerances for strong and reliable joints.

Inconsistent, thin walls approximately 20% less than required ASME B16.22 standard.

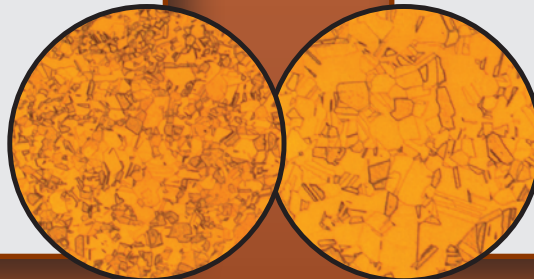
No manufacturer markings make identification very difficult should problems arise.

Inconsistent cup depths can lead to failures at the joint.



UL
700 PSI R410A

RATINGS, APPROVALS AND ORGIN UNKNOWN



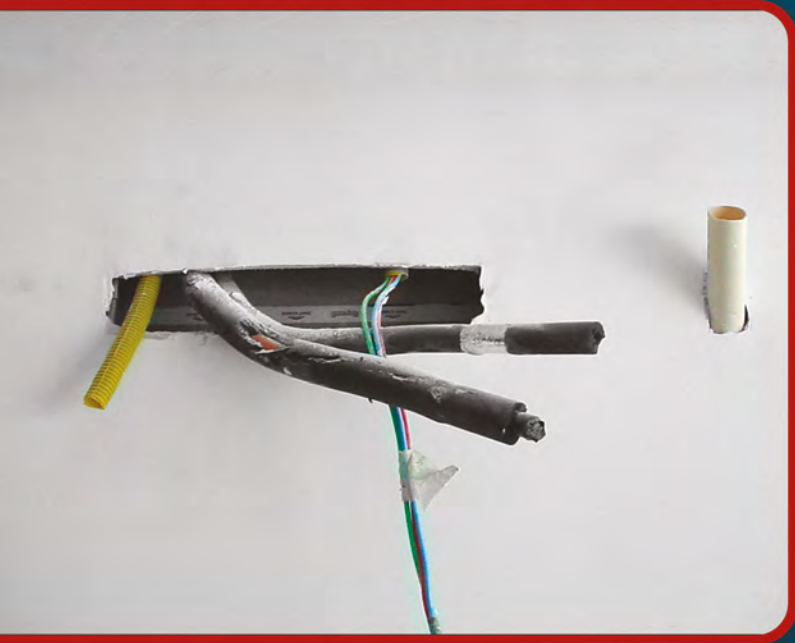
.055-mm avg. grain Streamline .070-mm avg. grain Other

A smaller, tighter copper grain structure results in a stronger fitting. In these sample magnifications at 100x, Streamline's copper outperforms by over 20%.

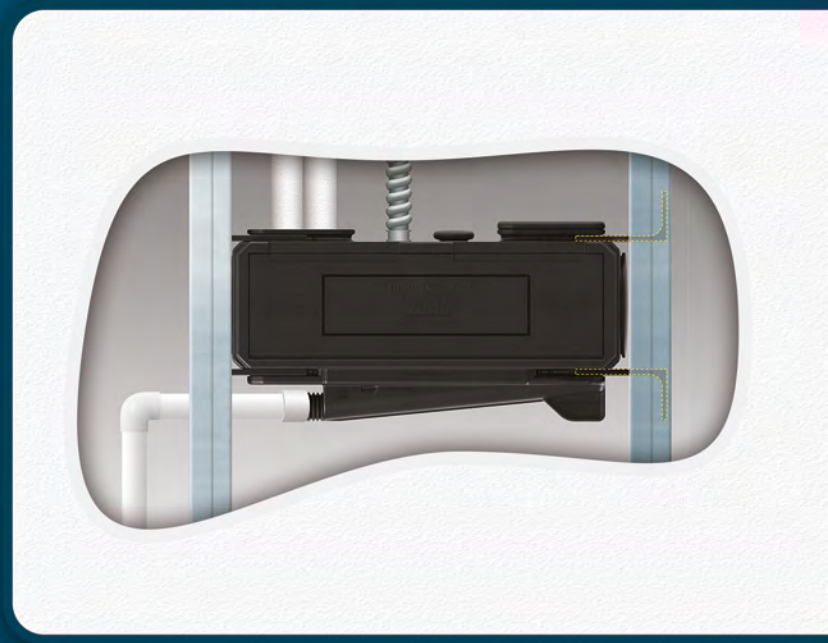
A BRAND OF MUELLER INDUSTRIES

HVAC

*This is no way to start a
Minisplit installation.*



*A perfect start ensures a
perfect finish!*



RoughinBox™
by **EXCELAIR**

Made in Brazil by

POLAR®
BUILDING SOLUTIONS



RoughinBox™ FOR US AND CANADA MINISPLIT PREMIUM CONSTRUCTION STANDARD

Since its inception in 1986 Polar has been recognized as a major developer of innovative solutions for minisplit air conditioner installations in Brazil and surrounding Latin American countries and it has been awarded several prizes, such as CBIC (Brazilian Construction Industry Chamber).

Polar's modern facilities and superior technology have been combined with the marketing expertise of Marketair to develop a new product line specifically for the North American market, to provide an economical solution, enhanced quality and substantial labor saving in the installation process for wall mounted minisplit air conditioners.

Founded by Gerry Spanger in April, 1986, Marketair was established as a manufacturer's representative organization to service wholesale HVACR distributors in the Northeast Quadrant of the USA.

Over the next few years the company became a part of the group of companies founded by Gerry Spanger. This included EZTRAP Inc. and Slimduct Inc. both of which were merged into Airtec Products Corporation in 2008.

During a corporate realignment following the sale of Airtec in August 2011, the local manufacturer's representative activities formerly performed by Marketair were transferred to an associated company, and it continued to develop its international business.

In January, 2016, Marketair was reactivated as an importer, manufacturer and distributor of new and innovative products for the HVACR industry, in which it also operates as a technical and sales and marketing consultancy, both in the USA and internationally.

Marketair is now the exclusive distributor for the USA and Canada for Polar Building Solutions, doing business from its main office in Edison New Jersey and a central distribution warehouse in Fort Worth Texas. The company also operates a sales office in Northern Indiana which controls a network of regional sales reps through which it services its national customer base.

RoughinBox™ by Excelair™ is the first of a full range of innovative rough-in-boxes for Minisplit (Ductless) Air Conditioners that deliver premium construction standard for the specialized conditions in the USA and Canada market.

RoughinBox™ by Excelair™, which conforms to current EEC standards, is manufactured by Polar™, who are certified by Tuv Rheinland and CE as an ISO 9000 manufacturer and hold a number of Brazilian and international Patents granted by INPI (National Institute of Industrial Property).

*Polar, Marketair, Excelair and RoughinBox are all registered trademarks.

CUTAWAY VERSION OF INSTALLED BOX



RoughinBox™ by Excelair & Polar

FEATURES AND BENEFITS

► Fits perfectly between standard wood or metal studs at 16" centers

2 Faceplate
retainer clamps
as well as an
extra evaporator
bracket support
are included



► Fully reversible for LH
or RH installations

Includes 2 integral side
ports for optional side
entry of lineset

► Backplate can easily be removed
to provide rear access from
another room for maintenance,
then closed off with an optional
white plastic cover plate

Reduced height of 6.6" permits
use in space restricted areas
over doors and windows

Provides closed off frame 1/2"
proud of stud surface to
facilitate sheetrocking

Removable hose barb
provides easy connection
to plain or insulated
minisplit drain hose

Integral 3/4" NPT threaded
nipple provides easy connection
to rigid PVC or copper pipe

Integral stress absorber
reduces cracking due to
overtorque and provides
flexibility for small
adjustments

Integral retainer clip
keeps evaporator drain
hose safely in place

On side drain model RBX-2-SD-NC,
asymmetric drain configuration
eliminates pooling and facilitates
complete drainage

Linear drain pan slope
guarantees complete drainage

Rounded edges on inlet ports
facilitate insertion of linesets and
eliminate tearing of insulation

Generous inlet ports accommodate
larger linesets & thicker insulation

Integral wiring inlet ports accommodate
both 1/2" and 3/4" cable

One piece molded construction
is completely waterproof

Suitable for use with wood
or metal studs (with
included adaptors)

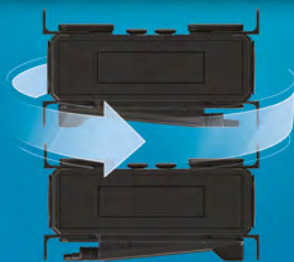
Hinged faceplate with retainer clamps
provides easy access when roughing
in linesets and wiring and protects
them during sheet rocking process



Faceplate is removed when evaporator is
installed and can be used as a mounting bracket
for condensate pump & reservoir (if required)



Unique design makes
the RoughinBox™
fully reversible



 PRODUCTS PATENTED IN BRAZIL
 PATENT PENDING IN USA

RoughinBox™ FOR MINISPLIT EVAPORATORS

➤ RBX1-CD-NC

Is 10" high and features a center drain for general use



Dimensions: 10" H x 14.5" W x 3.5" D

- ▶ Application – New residential or commercial sheetrock construction with wood or metal studs.
- ▶ Optional Accessory – TP004 Cover Plate

➤ RBX2-SD-NC

Is only 6,7" high and features a side drain for use in space restricted areas over doors and windows



Dimensions: 6.7" H x 14.5" W x 3.5" D

- ▶ Application – New residential or commercial sheetrock construction with wood or metal studs.
- ▶ Optional Accessory – TP004 Cover Plate

➤ Accessory and Finishing Cover

Evaporator Bracket Support



TPP 004



➤ Optional pump installation

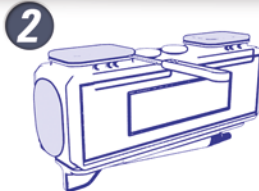


SUMMARIZED INSTALLATION PROCEDURE

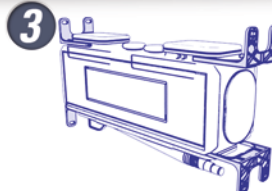
Preparing the RoughinBox™



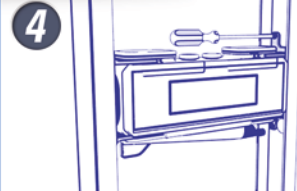
1 Select 1/2" or 3/4" cable port as required and remove its cap with a knife or hacksaw blade. FACING FRONT OF RoughinBox, SELECT LEFT HAND SLOT ONLY, DO NOT USE RIGHT HAND SLOT AS THIS WILL MAKE CONNECTION OF LINESET VERY DIFFICULT. Remove the slot cap with a knife or hacksaw blade, by cutting only along the marked cut line just below it. DO NOT CUT BELOW THIS LINE AS IT WILL DAMAGE THE SLOT WHICH RETAINS THE MOUNTING ADAPTOR.



2 IF USING A CONDENSATE PUMP, DO NOT REMOVE CLOSURE CAP AT END OF DRAIN OUTLET WHICH MUST REMAIN INTACT. If using gravity drain select drainage option required. If using 9/16" (14mm) ID insulated hose, remove closure cap at end of smaller barb, then CHECK THAT ITS ID IS NOT RESTRICTED. If using 5/8" (16mm) ID plain hose, cut off smaller barb. If using 3/4" rigid PVC or copper, cut off both barbs to expose threaded 3/4" NPT nipple. NOTE: DRAINAGE PIPING IS ATTACHED ONLY AFTER RoughinBox™ IS INSTALLED.

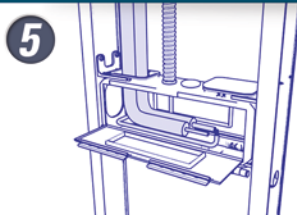


3 Remove all 4 mounting adaptors from slots at both ends of RoughinBox™ invert them so the fixing holes on top face up and fixing holes on bottom face down and replace them into the same slot.

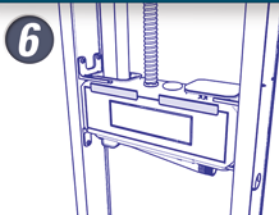


4 If studs are metal, determine which end of RoughinBox™ will face open side of stud and extend mounting adaptors on that end to their full length of 1 1/8" so that they reach into the stud to touch the flat surface, and lock them into position. IF STUDS ARE WOOD, MOUNTING ADAPTORS WILL NOT NEED TO BE EXTENDED AND THEY CAN BE USED AS IS FOR FIXING.

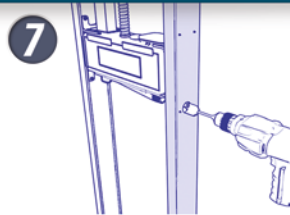
Installing the lineset & cable



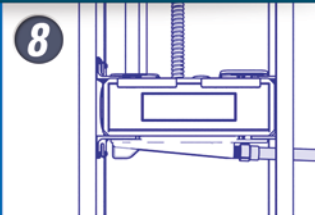
5 Cut around faceplate only along top and both side edges (lines 1, 2 and 3). DO NOT CUT LOWER EDGE (4) which forms a hinge so faceplate can fold down for access to interior of RoughinBox: Install lineset and electrical cable through ports selected, leaving enough slack to connect both into the evaporator.



6 Using the 2 plastic clips provided, close off the aperture by refitting the faceplate which remains in place until the sheetrock and painting are complete.



7 FOR RBX2-SD (shown) cut an opening in the stud facing the drain outlet and attach hose, PVC or copper coupler to appropriate connector on drain outlet as required. NOTE: FOR RBX1-CD DRAIN OUTLET FACES DOWN SO NO STUD CUTTING IS REQUIRED.



8 Attach drain to horizontal outlet if using RBX2 - SD or vertical outlet if using RBX1 - CD. FOR FLEXIBLE HOSE A CLAMP MUST BE FITTED. IF INSTALLING A THREADED PVC OR COPPER ADAPTOR, PTFE TAPE MUST BE USED.



MARKETAIR
A WORLD OF INNOVATION

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Venture Tape™ Line Set Tape 1507 & Venture Tape™ Reflective Insulation Seaming Tape 1507

Technical Data

April, 2015

Product Description 3M™ Venture Tape™ Line Set Tape 1507 and 3M™ Venture Tape™ Reflective Insulation Seaming Tape 1507 are a bi-axially oriented polypropylene (BOPP) tape coated with a cold weather solvent acrylic adhesive.

Product Construction	Backing	Adhesive	Color	Standard Roll Length
	Polypropylene (BOPP)	Acrylic	Line Set Tape available in White, Black, Silver. Reflective Insulation Seaming Tape available in Silver.	60 yds (55 m)

- Features**
- Excels in demanding temperature and humidity applications
 - Applies easily at cold temperatures

Typical Physical Properties **Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.**

Test	Typical Value	Typical Value (Metric)	Test Method
Product Thickness	3.0 mils	0.08 mm	PSTC-133
Peel Adhesion	30 oz/in	8.3 N/25 mm	PSTC-101
Shear Adhesion	>24 hrs @ 2.2 psi	>24 hrs @ 15.2 kPa	PSTC-107
Tensile Strength	20 lb/in	90.4 N/25 mm	PSTC-131
Elongation	130%	130%	PSTC-131
Service Temperature	-40° to 185°F	-40° to 85°C	

- Application Ideas**
- Ideal for sealing reflective insulation, flexible air duct and air connectors

3M™ Venture Tape™ Line Set Tape 1507 & 3M™ Venture Tape™ Reflective Insulation Seaming Tape 1507

Storage Store in a clean, dry place. Temperature of 40-80°F (4-26°C) and 40 to 50% relative humidity are recommended.

Shelf Life To obtain best performance, use this product within 12 months from date of manufacture

Technical Information The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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ISO 9001

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.



Industrial Adhesives and Tapes Division

3M Center, Building 225-3S-06
St. Paul, MN 55144-1000
800-362-3550 • 877-369-2923 (Fax)
www.3m.com/construction



Recycled Paper
40% pre-consumer
100% post-consumer

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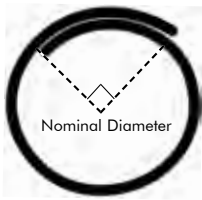


- **Easy, Cost Effective Installation**
- **More Flexible than Split Convuluted or Spiral Wrap**
- **25% Edge Overlap**
- **Cut and Abrasion Resistant**
- **Halogen Free**
- **Retains Shape & Rigidity Throughout -94°F to 257°F Temp. Range**
- **Melt Temp 482°F**

Flexible, Semi-Rigid Wrappable Split Braided Tube

FLEXO F6's (F6N) unique split, semi-rigid braided construction makes it the ideal solution for situations where ease of installation is of primary importance. The lateral split allows the tube to open up to accommodate a wide variety of bundling requirements, while the semi-rigid braid configuration simply closes around the entire installation without the need for any additional fasteners (Velcro, tape, etc.). The 10 mil PET braid is lightweight, quiet, and flexible. The 25% edge overlap (at nominal diameter) allows for coverage around inline plugs, connectors, and splices.

F6N will bend to a tight radius without distorting or splitting open, and unlike full rigid tubing, will not impair or affect the flexibility of harnesses. F6 allows for addition or removal of wires without disassembly.



The large overlap allows easy installation over splices and inline connectors without exposing wires and cables.



F6 orange is used for safety identification in both electric powered vehicles and military aircraft.



Nominal Size	Part #	Wall Thickness	Standard Put-Ups			Available Colors	Lbs/100'
			Bulk Box	Box A	Box B		
1/8"	F6N0.13	.024"	10,000'	400'	100'	BK, OR, PG, CW	0.20
1/4"	F6N0.25	.025"	3,000'	200'	100'	BK, OR, PG, CW	0.60
3/8"	F6N0.38	.025"	1,500'	150'	75'	BK, OR, PG, CW	1.20
1/2"	F6N0.50	.025"	1,200'	150'	75'	BK, OR, PG, CW	1.40
3/4"	F6N0.75	.025"	500'	100'	50'	BK, OR, PG, CW	1.60
1"	F6N1.00	.038"	400'	100'	50'	BK, OR, PG, CW	2.00
1 1/4"	F6N1.25	.038"	250'	75'	25'	BK, OR, PG, CW	2.40
1 1/2"	F6N1.50	.038"	250'	75'	25'	BK, OR, PG, CW	2.70
2"	F6N2.00	.038"	200'	50'	25'	BK, OR, PG, CW	3.60





F6 is available in self-dispensing boxes.



F6 Installation Tool

This simple tool makes installing long lengths of F6 sleeving a breeze. Just insert your bundle of wires into the shank of the tool and slide it along the split in the sleeving. As the tool travels along the sleeving, it deposits the wires and allows the split to close correctly. See part numbers on page 100.



1-973-300-9242
www.techflex.com



TECHNICAL INFORMATION SHEET

STAY-SILV® 15 BRAZING FILLER METAL

NOMINAL CHEMICAL COMPOSITION%:

Phosphorus	4.8-5.2
Copper	Remainder
Silver	14.5-15.5
Other (Total)	0.15

TYPICAL PHYSICAL PROPERTIES:

Solidus	1190°F (643°C)
Liquidus	1475°F (802°C)
Brazing Range	1300°F- 1500°F (704°C -816°C)
Electrical Conductivity	9.9 (%IACS)
Electrical Resistivity	17.4

BRAZING PROPERTIES:

Stay Silv 15 brazing filler metal is a frequent choice for brazing copper, especially in brazing air conditioning and refrigeration connections. The alloy has a wide melting range which allows the operator to fill loose connections and “cap” or build up around the finished joint. When heated above its liquidus temperature, however, it will flow into tight connections.

Stay Silv 15 can be used to braze brass with the use of appropriate brazing flux. Stay Silv 15 is not recommended for brazing steel or other ferrous metals due to sufficient lack of joint ductility. It is generally suitable for brazing low nickel, (10% maximum), copper/nickel base metals.

CORROSION RESISTANCE

Generally similar to the copper base metal, but phosphorus containing alloys, including Stay Silv 15, should not be used if the braze is exposed to sulfur or sulfur compounds in service.

AVAILABLE FORMS

Standard wire diameters, strip, preform rings, and wound on spools.

RECOMMENDED FLUX:

No flux is required for copper brazing. For brazing brass or copper to brass Stay-Silv® white flux is suitable for most applications. Harris ECO SMART® boric acid free flux, (powder or paste), is also an excellent choice to promote sound brazed assemblies and comply with European REACH requirements

SPECIFICATION COMPLIANCE:

ANSI/AWS A5.8 Class BCuP-5, ASME SFA 5.8 Class BCuP-5, QQ-B-654A BCuP-5, ISO 17672 CuP 284

SAFETY INFORMATION:

WARNING: PROTECT yourself and others. Read and understand this information.

FUMES AND GASES can be hazardous to your health.

HEAT RAYS, (infrared radiation) from flame or hot metal can injure eyes.

- Before use, read and understand the manufacturer's instructions, Material Safety Data Sheets (MSDS), and your employer's safety practices.
- Keep your head out of fumes.
- Use enough ventilation, exhaust at the flame, or heat source, to keep fumes and gases from your breathing zone and the general area.
- Wear correct eye, ear, and body protection.
- See American National Standard Z49.1, *Safety in Welding, Cutting, and Allied Processes*, published by the American Welding Society, 8669 Doral Blvd., Doral, Florida 33166; OSHA Safety and Health Standards, available from the U.S. Government Office, Washington, DC 20402.

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