



224 Crescent Avenue · Chelsea, MA 02150 · (617) 889-0665 · www.wsaiken.com

**Product Submittals**

**Date:** 11/18/2022

**Project:** Belmont Town Hall  
 Chimney Caps  
 455 Concord Ave  
 Belmont, MA 02478

**Consultant:** Calhess  
 374 Uiveristy Avenue  
 Westwood, MA 02090

Items	Materials	Manufacturer	Spec Section
<b>061011 - Rough Capentry</b>			
Lumber	Pressure Treated Lumber	LifeWood	2.02
Wood Screws	Self-Tapping Screws (Philips Pan Head) Tye A Stanless Steel A2	Brighton Best	2.04
<b>076200 - Sheetmetal Flashing</b>			
Fasteners	Machine Screws, Slotted Round head, Brass	BoltDepot	N/A
Fasteners	Concrete Anchors	TapCon	N/A
Sheetmetal	20 oz Standard Cold Rolled Copper	Revere	N/A
Underlayment	Grace Ultra	GCP	N/A
Slip Sheet	Red Rosin Paper	W.R. Meadows	N/A
Flux	E-127 Flux M' Solder	Johnson's	N/A
Solder	#497 Lead free Solders	Johnson's	N/A
Shop Drawing	Section at Chimney Cap 1 & 2	W.S. Aiken	N/A
Shop Drawing	Section at Chimney Cap 3	W.S. Aiken	N/A

## PRESERVATIVE TREATMENT SPECIFICATION



### 1. Product Name

MicroPro®/LifeWood® Preserved Wood

### 2. Manufacturer

Osmose, Inc.

P.O. Drawer O

1016 Everee Inn Road

Griffin, GA 30224-0249

(800) 241-0240

(770) 233-4200

Fax: (770) 229-5225

E-mail: [treatedwood@osmose.com](mailto:treatedwood@osmose.com)

[www.osmosewood.com](http://www.osmosewood.com)

### 3. Product Description

#### BASIC USE

MicroPro/LifeWood® preserved wood is a product offered as an alternative to wood products treated with Alkaline Copper preservative treatments. MicroPro/LifeWood preserved wood products provide retailers, treaters, consumers, builders, and architects an option in their selection of pressure treated wood products.

For many backyard and commercial projects, such as decks, fences, landscaping, and fresh water boat docks, MicroPro/LifeWood products are an alternative to traditional pressure treated wood for these reasons:

- Long term field testing shows that MicroPro treated wood provides effective protection against fungal decay and termite attack.
- First Wood Treatment Process to Complete Life-Cycle Assessment Studies - The Osmose MicroPro wood treatment process systems were analyzed by Scientific Certification Systems under an exhaustive environmental review process called Life-Cycle Assessment (LCA), in accordance with rigorous international standards set by ISO, the leading international standards setting organization. The MicroPro LCA studies are in compliance with ISO standards 14044 and 14025.
- Lighter, more natural wood appearance.
- Improved painting and staining qualities.
- Better corrosion resistance for code-approved fasteners and hardware.
- Carbon steel fasteners may be used for interior, above ground, weather-protected applications such as sill plates, interior framing and interior trusses.
- End uses include interior and exterior above ground, ground contact, and fresh water immersion.
- MicroShades®, innovative micronized pigment color choices – pressure treated wood colors similar to redwood & cedar.
- Treated wood warranty programs (See warranty for details\*).

- Approved for aluminum contact.\*\*
- Building code compliant. ICC-ES Report, ESR-2240.

## **COMPOSITION & MATERIALS**

The MicroPro/LifeWood wood preservative is a waterborne, micronized copper azole system developed to provide protection of wood exposed in interior or exterior applications. The MicroPro/LifeWood system is based on the well-established effectiveness of copper combined with an organic quaternary compound and is applied to wood by pressure treatment. Copper and azoles are effective fungicides and termiticides. Together they provide protection from a broad spectrum of decay fungi and termites.

Depending on the desired product application, wood species and exposure hazard, the MicroPro/LifeWood preservative system may be formulated with a number of specialty additives, such as water repellents, to enhance product performance.

## **COLORS**

Freshly treated MicroPro/LifeWood products begin with a light green color and will, over time, turn to a honey tan color after exposure to sunlight. As with most outdoor wood products, MicroPro/LifeWood products will eventually fade to gray over time. Because of its lighter color, it has better paint and stainability. MicroPro/LifeWood treated wood products are also available in popular consumer colors similar to redwood and cedar products with the MicroShades™ color pigment system.

## **LIMITATIONS**

MicroPro/LifeWood micronized copper azole preservatives are used to pressure treat the following materials:

- Dimensional lumber and timbers of the following species - Southern Pine, Ponderosa Pine, Red Pine, Incised Hem Fir, Radiata Pine, Caribbean Pine and German Scots Pine
- Maximum nominal size of 5/4" × 8" in all listed species for decking use only
- Southern Pine and Douglas Fir plywood
- Round and sawn posts and building poles of Southern Pine and Red Pine

Minimum preservative retention levels are provided in ICC Evaluation Services, Inc. ESR - 2240. MicroPro/LifeWood preserved wood products are designed for long-term performance in outdoor applications and; therefore, require high quality corrosion resistant nails, screws, and other fasteners. Use hot dip galvanized, stainless steel, or other fasteners and hardware as recommended by the hardware manufacturer and meet building code requirements.

Aluminum building products may be placed in direct contact with MicroPro treated wood products used for interior uses and above ground exterior applications such as decks, fencing, and landscaping projects. Examples of aluminum products include siding, roofing, gutters, door and window trim, flashing, nails, fasteners and other hardware connectors. However, MicroPro treated wood in direct contact with aluminum products should only be used in code compliant construction applications that provide proper

water drainage and do not allow the wood to be exposed to, or remain in contact with a continual moisture source, standing water or water immersion. In addition, MicroPro treated wood should not be encased, sealed, or wrapped with aluminum products where trapped moisture or water can occur so as to avoid pitting or other unwanted results. We recommend you contact the aluminum building product manufacturer for their recommendations regarding their aluminum products in contact with MicroPro treated wood used in ground contact applications or when MicroPro treated wood is exposed to salt water, brackish water, or chlorinated water, such as swimming pools or hot tubs. Also check with the aluminum product manufacturers regarding compatibility with other chemicals and cleaning agents. Contact Osmose for further information on aluminum contact use in commercial, industrial, and specialty applications such as boat construction.

MicroPro/LifeWood products are not currently approved for saltwater immersion applications

#### **4. Technical Data**

##### **APPLICABLE STANDARDS**

American Wood Protection Association (AWPA)

AWPA Analytical Standards used for quality control of MicroPro/LifeWood treated wood A2-06, A3-05, A9-01, A11-93, A16-93, A17-03, A18-05, A21-00, A36-04, A37-05

ICC Evaluation Services, Inc. ESR – 2240.

##### **APPROVALS**

MicroPro/LifeWood products, as described in ICC-ES ESR-2240, meet all major model building code requirements. The preservative technology in MicroPro/LifeWood products is registered by EPA as a non-restricted use pesticide and does not require Proposition 65 labeling in California.

##### **ENVIRONMENTAL CONSIDERATIONS**

This preservative is registered with the Environmental Protection Agency (EPA).



##### **Product Highlights and EPP (Environmentally Preferable Product) Benefits**

First Wood Treatment Process to Receive EPP Status – The Osmose MicroPro technology is the first treated wood process to be certified under Scientific Certification Systems' Environmentally Preferable Product (EPP) program based on Life-Cycle Assessment.

First Wood Treatment Process to Complete Life-Cycle Assessment Studies – The Osmose MicroPro wood treatment process systems were analyzed by Scientific Certification Systems under an exhaustive environmental review process called Life-Cycle Assessment (LCA), in accordance with rigorous international standards set by ISO, the leading international standards setting organization. The MicroPro LCA studies are in compliance with ISO standards 14044 and 14025.

Reduced Energy Use – The Osmose MicroPro treated wood process reduces total energy use by approximately 80% and greatly reduces greenhouse gas emissions.

Largely Eliminates Copper Releases – Wood products treated with the Osmose MicroPro process result in the release of 90% to 99% less copper into aquatic and terrestrial environments when compared to standard treated wood products. The very small amount released bonds readily to organic matter in the soil and becomes biologically inactive, thus effectively eliminating eco-toxic impacts.

Reduced Air Emissions – The solution containing the MicroPro copper preservative formula is four times more concentrated than the industry standard. As a result, fewer trucks are required for transport. Fewer trucks, combined with the absence of monoethanolamine (MEA) in the production process, result in a reduction of air pollutants from tailpipe emissions and associated impacts, including: soot, nitrous oxide, volatile organic compounds (VOC's), particulate matter, and reduced impacts of acid rain, smog, and oceanic acidification.

Reduced Greenhouse Gas Emissions – The absence of MEA in the production process, combined with the reduced use of fuel and fewer trucks, means that using MicroPro technology in lieu of standard wood treatment formulations reduces an estimated 20,000 tons or more of greenhouse gas emissions each year. (This is the equivalent to the annual emissions of approximately 2,200 SUV's.)

For more information, visit [www.scscertified.com](http://www.scscertified.com).

#### **NAHB Green Approved Product Certification**

MicroPro wood preservative technologies have earned Green Approved Product certification from the National Association of Home Builders (NAHB) Research Center under the National Green Building Standard™ program.



The National Green Building Standard program is an American National Standards Institute (ANSI) approved consensus-based standard that defines the criteria for certifying a building (single-family or multifamily; new construction, addition, or renovation) as "Green."

For more information on the NAHB Research Center, visit [www.nahbgreen.org](http://www.nahbgreen.org). For information on the MicroPro Green Approved Product certifications, visit [www.greenapprovedproducts.com](http://www.greenapprovedproducts.com).

## **GREENGUARD Children and Schools<sup>sm</sup> Certification**

MicroPro wood preservative technologies have earned GREENGUARD Children and Schools Certification from the GREENGUARD Environmental Institute (GEI).



GREENGUARD Children & Schools Certification indicates that a product has undergone rigorous testing and has met stringent standards for low volatile organic compound (VOC) emissions. Products certified to this criteria are suitable for use in schools, offices, and other sensitive environments.

The GREENGUARD Environmental Institute is an industry independent, third-party not-for-profit organization that oversees the GREENGUARD Certification programs. The mission of the institute is to protect human health and quality of life through programs that reduce chemical exposure and improve indoor air quality. GEI is an American National Standards Institute (ANSI) authorized standards developer.

For more information about the GREENGUARD Environmental Institute, visit [www.greenguard.org](http://www.greenguard.org).

## **PHYSICAL/CHEMICAL PROPERTIES**

Additional product information on MicroPro/ LifeWood products is available from Osmose, Inc., upon request. MicroPro/ LifeWood treated products should carry the following information:

1. Name of wood treating company
2. Treatment plant city and state
3. Symbol "Micronized Copper Azole"
4. Preservative retention level
5. Approved use
6. ESR number
7. Third party inspection agency

## **PREPARATORY WORK**

Handle and store product according to Osmose, Inc. recommendations. Allow materials exposed to incidental moisture to dry thoroughly prior to covering with vapor or moisture-retarding finish materials.

## **METHODS**

MicroPro/LifeWood products are workable with common tools. Complete installation recommendations are available from the manufacturer.

For interior or exterior applications use fasteners and hardware that are in compliance with the manufacturer's recommendations and the building codes for their intended use. As with any good design and construction practices, MicroPro treated wood should not be used in applications where trapped moisture or water can occur. Where design and/or actual conditions allow for constant, repetitive, or long periods of wet conditions, only stainless steel fasteners should be used.

Certain adhesives add extra holding power. Apply adhesives in accordance with manufacturer's directions.

As a general rule, attach boards bark side up (annual rings arc upward) to reduce cupping; however, the best face should be placed up when a defect of the wood is apparent. Fasten thin boards to thicker boards to maintain structural integrity.

Drill pilot holes especially when fastening near the edge or end of a board. Pilot holes will help minimize splitting.

Should the wood become wet during construction, butt deck boards together. As drying occurs, some shrinkage can be expected. If the wood is dry, allowing for shrinkage is not necessary.

Brush-on end coat wood preservative is recommended on all saw cuts and into drill holes during construction of wood projects. Also apply on areas where moisture can collect. Always follow manufacturer's recommendations.

For exterior applications, the application of a quality clear water repellent or semi-transparent stain which contains water repellent will help minimize the cycles of moisture take-up and loss the wood goes through outdoors.

First, determine if the MicroPro/LifeWood product has been pressure treated with a factory applied water repellent by looking at the end tag. If not factory water repellent treated, thoroughly clean the project with a deck cleaning product. Clear water repellent can be immediately applied to wood. If you choose a semi-transparent stain which contains a water repellent, first check to insure surface is dry. If not, either wait until the surface is dry or immediately apply clear water repellent and wait approximately 8 weeks before applying a chosen color of semi-transparent stain.

If the MicroPro/LifeWood products contain a factory water repellent, an oil based stain can be applied after 30 - 60 days and water based stains can be applied after 6 months. Check that the wood surface is dry before applying stain. In all instances, follow the manufacturer's directions when applying water repellents or semi-transparent stains, which may contain water repellent.

## **IMPORTANT INFORMATION**

MicroPro/LifeWood Treated Wood Handling and Use Recommendations.

- MicroPro/LifeWood pressure treated wood has corrosion rates on metal products similar to CCA (chromated copper arsenate) pressure treated wood and untreated wood. Use fasteners and hardware that are in compliance with the manufacturer's recommendations and the building codes for their intended use. When using aluminum products in conjunction with MicroPro/LifeWood treated wood, refer to the MicroPro/LifeWood Fastener and Hardware information Sheet for additional information.
- Do not burn preserved wood.
- Wear a dust mask and goggles when cutting or sanding wood.

- Wear gloves when working with wood.
- Some preservative may migrate from the treated wood into soil/water or may dislodge from the treated wood surface upon contact with skin. Wash exposed skin areas thoroughly.
- All sawdust and construction debris should be cleaned up and disposed of after construction.
- Wash work clothes separately from other household clothing before reuse.
- Preserved wood should not be used where it may come into direct or indirect contact with drinking water, except for uses involving incidental contact such as fresh water docks and bridges.
- Do not use preserved wood under circumstances where the preservative may become a component of food, animal feed, or beehives.
- Do not use preserved wood as mulch.
- Only preserved wood that is visibly clean and free of surface residue should be used.
- If the wood is to be used in an interior application and becomes wet during construction, it should be allowed to dry before being covered or enclosed.
- Disposal Recommendations: Preserved wood may be disposed of in landfills or burned in commercial or industrial incinerators or boilers in accordance with federal, state, and local regulations.
- If you desire to apply a paint, stain, clear water repellent, or other finish to your preservative treated wood, we recommend following the manufacturer's instructions and label for the finishing product. Before you start, we recommend you apply the finishing product to a small exposed test area before finishing the entire project to insure it provides the intended result before proceeding.
- Projects should be designed and installed in accordance with federal, state, and local building codes and ordinances governing the construction in your area and in accordance with the National Design Specifications (NDS) and the Wood Handbook.
- Mold growth can and does occur on the surface of many products, including untreated and treated wood, during prolonged surface exposure to excessive moisture conditions. To remove mold from the treated wood surface, wood should be allowed to dry. Typically, mild soap and water can be used to remove remaining surface mold. For more information visit [www.epa.gov](http://www.epa.gov).
- For more information visit [www.osmosewood.com](http://www.osmosewood.com).

## **BUILDING CODES**

Properly processed MicroPro/LifeWood products meet the requirements of most applicable building codes. Micro Pro/ LifeWood products are building code compliant, ICC Evaluation Services, Inc. ESR - 2240. Current data on building code requirements and product compliance maybe obtained from Osmose, Inc., technical support specialists. Installation must comply with the requirements of all applicable local, state, and national code jurisdictions.

## **6. Availability & Cost**

### **AVAILABILITY**

Contact manufacturer for information on local firms which apply the MicroPro/LifeWood treatment.



## **COST**

Budget installed cost information may be obtained from a MicroPro/LifeWood pressure treatment firm or through a retail distributor of MicroPro/LifeWood products.

## **7. Warranty**

A Lifetime Residential and Agricultural Limited Warranty is offered on MicroPro/LifeWood products at 0.060 pcf and 0.150 pcf retention levels for material used in residential and agricultural applications. See Warranty for specific provisions. An independent third-party quality control agency is required for the use of the MicroPro/LifeWood trademark and MicroPro/LifeWood Lifetime Residential and Agricultural Limited Warranty.

## **8. Maintenance**

There are no specific maintenance requirements for MicroPro/LifeWood treated materials, except the periodic inspection and application of a water repellent or stain as described in the Methods section. Periodic building inspection by a qualified individual to ensure sound material may be advisable in high risk service environments.

## **9. Technical Services**

A staff of trained service personnel offers design assistance and technical support. For technical assistance, contact Osrose, Inc., P.O. Drawer O, 1016 Everee Inn Road, Griffin, GA 30224-0249; Telephone: (800) 241-0240, (770) 233-4200; Fax: (770) 229-5225; E-mail: [treatedwood@osrose.com](mailto:treatedwood@osrose.com); Web site: [www.osrosewood.com](http://www.osrosewood.com).



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**SELF-TAPPING SCREWS**  
(Philips Oval Head)  
Type A Stainless Steel A2(18-8)  
(Inch) ASME B18.6.4-1998



**SELF-TAPPING SCREWS**  
(Philips Pan Head)  
Type A Stainless Steel A2(18-8)  
(Inch) ASME B18.6.4-1998

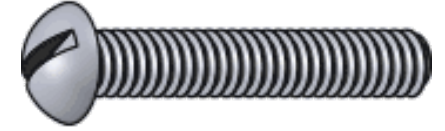
SCREWS

Diameter	Length	Keg Qty	Box Qty	Weight/M	Code
#6	3/8"	5000	1000	1.73	791006
	1/2"	5000	1000	1.97	791012
	5/8"	5000	1000	2.06	791018
	3/4"	5000	1000	2.58	791024
	7/8"	5000	1000	2.82	791030
	1"	5000	1000	3.25	791036
	1 1/4"	4000	1000	3.79	791042
	1 1/2"	3000	1000	4.50	791048
	2"	2000	500	6.10	791054
#8	1/2"	5000	1000	2.75	791060
	3/4"	4000	1000	3.57	791066
	7/8"	4000	1000	4.11	791072
	1"	4000	1000	4.55	791078
	1 1/4"	2000	500	5.53	791084
	1 1/2"	2000	500	6.60	791090
	2"	2000	500	8.33	791096
	2 1/2"	800	200	10.25	791102
	#10	5/8"	3000	1000	4.72
3/4"		2000	500	5.06	791114
7/8"		2000	500	5.56	791120
1"		2000	500	6.21	791126
1 1/4"		2000	500	8.58	791132
1 1/2"		2000	500	8.85	791138
1 3/4"		1000	500	9.17	791144
2"		1000	500	11.10	791150
2 1/2"		800	200	13.40	791156
3"		800	200	15.80	791162
#12	5/8"	2000	500	5.90	791168
	1"	2000	500	8.71	791174
	1 1/4"	1000	500	12.00	791180
	1 1/2"	1000	500	13.40	791186
	1 3/4"	1000	500	14.80	791192
	2"	1000	500	17.20	791198
	2 1/2"	800	200	18.20	791204
	3"	800	200	21.50	791210
#14	3/4"	1000	500	10.33	791216
	1"	1000	500	11.90	791222
	1 1/4"	1000	500	14.61	791228
	1 1/2"	1000	500	16.50	791234
	2"	500	100	21.60	791240
	2 1/2"	500	100	25.69	791246
3"	500	100	30.13	791252	

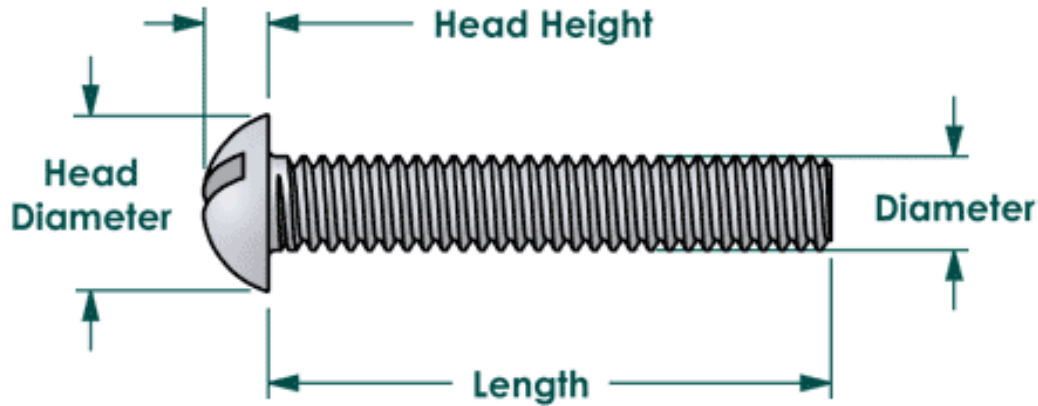
Diameter	Length	Keg Qty	Box Qty	Weight/M	Code
#6	1/4"	5000	1000	1.64	792006
	3/8"	5000	1000	1.80	792012
	1/2"	5000	1000	2.17	792018
	5/8"	5000	1000	2.35	792024
	3/4"	5000	1000	2.80	792030
	1"	5000	1000	3.55	792036
	1 1/4"	4000	1000	4.28	792042
	1 1/2"	3000	1000	5.61	792048
	2"	2000	500	7.00	792054
	#8	1/2"	5000	1000	3.19
5/8"		4000	1000	3.67	792066
3/4"		4000	1000	4.17	792072
7/8"		4000	1000	4.45	792078
1"		4000	1000	5.00	792084
1 1/8"		3000	1000	5.80	792090
1 1/4"		2000	500	5.95	792096
1 1/2"		2000	500	6.97	792102
2"		2000	500	8.67	792108
2 1/2"		800	200	10.69	792114
3"	800	200	12.56	792120	
#10	1/2"	3000	1000	4.56	792126
	5/8"	3000	1000	5.13	792132
	3/4"	2000	500	5.57	792138
	7/8"	2000	500	6.29	792144
	1"	2000	500	6.88	792150
	1 1/4"	2000	500	8.20	792156
	1 1/2"	2000	500	11.20	792162
	2"	1000	500	11.58	792168
	2 1/2"	800	200	14.00	792174
	3"	800	200	16.50	792180
#12	1/2"	2000	500	6.36	792186
	5/8"	500	100	7.15	792192
	3/4"	2000	500	7.93	792198
	1"	2000	500	9.42	792204
	1 1/4"	1000	500	11.40	792210
	1 1/2"	1000	500	12.50	792216
	2"	1000	500	15.75	792222
	2 1/2"	800	200	19.00	792228
	3"	800	200	22.30	792234
	#14	1/2"	1000	500	9.42
3/4"		1000	500	11.24	792246
1"		1000	500	13.46	792252
1 1/4"		1000	500	15.60	792258
1 1/2"		1000	500	18.21	792264
2"		500	100	22.70	792270



## Machine screws, Slotted round head, Brass, 1/4"-20 x 1-3/4"



### Product Images



### Product details

**Bolt Depot Product #:** 1233

**Units:** US

**Category:** Machine screws




**Subcategory:** Machine screws

**Head style:** Round

## Product details

Drive type:	Slotted
Material:	Brass
Thread density:	Coarse
Diameter:	1/4"
Thread count:	20
Length:	1-3/4"
Thread direction:	Right hand
Dimensional standard:	ASME B18.6.3
Head height Min:	0.160"
Head height Max:	0.175"
Head diameter Min:	0.443"
Head diameter Max:	0.472"

## Matching Products

Prod. #	Description
<u>4152</u>	 <b><u>Hex nuts, Brass, 1/4"-20</u></b> A standard six sided nut.
<u>11787</u>	 <b><u>Hex nylon insert lock nuts, Brass, 1/4"-20</u></b> A hex nut with a nylon ring to resist loosening.
<u>2945</u>	 <b><u>Flat washers, Brass, 1/4"</u></b> General use flat washer

### ULTIMATE TENSION AND SHEAR VALUES (LBS/KN) IN CONCRETE

ANCHOR DIA In.(mm)	MIN. DEPTH OF EMBEDMENT In.(mm)	f' c = 2000 PSI (13.8 MPa)		f' c = 3000 PSI (20.7 MPa)		f' c = 4000 PSI (27.6 MPa)		f' c = 5000 PSI (34.5 MPa)	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/16 (4.8)	1 (25.4)	600 (2.7)	720 (3.2)	625 (2.8)	720 (3.2)	650 (2.9)	720 (3.2)	800 (3.6)	860 (3.8)
	1-1/4 (31.8)	845 (3.7)	720 (3.2)	858 (3.8)	720 (3.2)	870 (3.9)	720 (3.2)	1,010 (4.5)	860 (3.8)
	1-1/2 (38.1)	1,090 (4.8)	860 (3.8)	1,090 (4.8)	860 (3.8)	1,090 (4.8)	860 (3.8)	1,220 (4.8)	860 (3.8)
	1-3/4 (44.5)	1,450 (6.5)	870 (3.9)	1,455 (6.5)	870 (3.9)	1,460 (6.5)	990 (4.4)	1,730 (7.7)	990 (4.4)
1/4 (6.4)	1 (25.4)	750 (3.3)	900 (4.0)	775 (3.4)	900 (4.0)	800 (3.6)	1,360 (6.1)	950 (4.2)	1,440 (6.4)
	1-1/4 (31.8)	1,050 (4.7)	900 (4.0)	1,160 (5.2)	900 (4.0)	1,270 (5.6)	1,360 (6.1)	1,515 (6.7)	1,440 (6.4)
	1-1/2 (38.1)	1,380 (6.1)	1,200 (5.3)	1,600 (7.2)	1,200 (5.3)	1,820 (8.1)	1,380 (6.1)	2,170 (9.7)	1,670 (7.4)
	1-3/4 (44.5)	2,020 (9.0)	1,670 (7.4)	2,200 (9.8)	1,670 (7.4)	2,380 (10.6)	1,670 (7.4)	2,770 (12.3)	1,670 (7.4)

Safe working loads for single installation under static loading should not exceed 25% of the ultimate load capacity.

### ULTIMATE TENSION AND SHEAR VALUES (LBS/KN) IN HOLLOW BLOCK

ANCHOR DIA In.(mm)	ANCHOR EMBEDMENT In.(mm)	LIGHTWEIGHT BLOCK		MEDIUM WEIGHT BLOCK	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/16 (4.8)	1 (25.4)	220 (1.0)	400 (1.8)	340 (1.5)	730 (3.2)
1/4 (6.4)	1 (25.4)	250 (1.1)	620 (1.8)	500 (2.2)	1,000 (4.4)

Safe working loads for single installation under static loading should not exceed 20% of the ultimate load capacity.

**NOTE:** 3/16" Tapcon requires 5/32" bit, 1/4" Tapcon requires 3/16" bit.



### ALLOWABLE EDGE AND SPACING DISTANCES

PARAMETER	ANCHOR DIA. In.(mm)	NORMAL WEIGHT CONCRETE			CONCRETE MASONRY UNITS (CMU)		
		FULL CAPACITY (Critical Distance Inches)	REDUCED CAPACITY (Minimal Distance Inches)	LOAD REDUCTION FACTOR	FULL CAPACITY (Critical Distance Inches)	REDUCED CAPACITY (Minimal Distance Inches)	LOAD REDUCTION FACTOR
Spacing Between Anchors - Tension	3/16	3	1-1/2	0.73	3	1-1/2	1.00
	1/4	4	2	0.66	4	2	0.84
Spacing Between Anchors - Shear	3/16	3	1-1/2	0.83	3	1-1/2	1.00
	1/4	4	2	0.82	4	2	0.81
Edge Distance - Tension	3/16	1-7/8	1	0.83	3	2	0.91
	1/4	2-1/2	1-1/4	0.82	4	2	0.81
Edge Distance - Shear	3/16	2-1/4	1-1/8	0.70	3	2	0.93
	1/4	3	1-1/2	0.59	4	2	0.80

For SI: 1 inch = 25.4 mm

## JOB DONE RIGHT THE FIRST TIME, EVERY TIME



# FreedomGray

Tin-Zinc Coatings Perform



## Revere T-Z<sup>®</sup> Product is Durable, Attractive and Easy on the Environment.

Revere Tin-Zinc<sup>®</sup> products are coated on both sides with a unique, patented T-Z Alloy<sup>™</sup> (tin-zinc alloy). It offers all the advantages of copper with a naturally weathering earthtone gray color. Revere's T-Z<sup>®</sup> coated products are rugged, environmentally friendly and aesthetically appealing, for use in virtually all architectural metal applications.

*The three layers of FreedomGray Satin T-Z Alloy<sup>™</sup>.*

- 1 Tin-zinc alloy with satin finish
- 2 Intermetallic layer
- 3 Copper (99.5% pure)

The tin-zinc alloy is applied to both sides of our sheets and coils, using the hot-dip process. This ensures complete coverage and eliminates voids.

A satin finish is factory-applied to FreedomGray Satin T-Z Alloy<sup>™</sup>, to reduce initial reflectiveness and provide a natural, weathered appearance. The satin-finished Tin/Zinc surface begins to oxidize and starts to darken upon exposure. Environmental conditions and severity of exposure dictate how long this will take.

As with plain and pre-patinated copper, FreedomGray Satin T-Z Alloy<sup>™</sup> will always display differences in the shades and hues of its natural patina. These are **NOT** an indication of defective material. In many respects it is the variations that give T-Z<sup>®</sup> coated products their unique life, vitality and aesthetics.



# Tin-Zinc Coated Products

## T-Z<sup>®</sup> Alloy Coatings vs. Zinc: A Revealing Comparison.

When a durable gray architectural metal roof is called for, FreedomGray Satin T-Z Alloy™ offers numerous advantages over zinc. Like all architectural copper, FreedomGray T-Z Alloy™ is easier to form, simpler to install and more durable in most environmental conditions.

*Some comparisons:*

- **More versatile forming** – Our T-Z<sup>®</sup> coated products can be formed, installed and subjected to sub-freezing temperatures with no adverse effects.

Sharp, zero-radius bends, which are typical with all architectural metal work, can stress zinc to the point that it cracks or splits. Expansion movement caused by daily and seasonal temperature changes can aggravate minor splits and make them “run” or grow.

FreedomGray can be formed and installed with the same bends as plain copper.

- **Less restrictive installation** – Moisture on the reverse side of zinc can cause severe and rapid corrosion. In extreme conditions it can “rust through” in less than a year. To avoid this problem, the underside of zinc must be ventilated – installed above the roof deck. This difficult, costly installation is not necessary with our T-Z<sup>®</sup> coated product, which can be applied directly over roof decks.

- **Greater durability** – Ice dams, in valleys and along eaves, are a common winter occurrence in much of the country.

Water trapped behind these dams can (and does) penetrate locks and seams.

With zinc roofs, this can lead to “underside corrosion.” Moisture trapped on the underside of copper, on the other hand, has no negative effects, making T-Z<sup>®</sup> coated product a better choice for long-term durability.

- **Physical properties** – Properties of sheet zinc (coefficient of thermal expansion, tensile strength, creep rate, etc.) depend upon temperature and direction of rolling. The chart shown here compares the coefficients of thermal expansion for zinc, stainless steel and copper.

- **Soldering** – Zinc anneals at 212°F and melts at 784°F. Standard solder begins to flow at 420°F. As a result, soldering changes the grain size of zinc (anneals it) and weakens it at the seam. If too much heat is applied, a hole can easily be burned through zinc.

The melting point of architectural copper is 1,981°F. At 700°F, it takes almost an hour for copper to begin to anneal. As discussed later in this brochure, FreedomGray is soldered similar to plain copper.

## In Any Environment, T-Z<sup>®</sup> Coated Copper Fits.

FreedomGray Satin T-Z Alloy™ is appropriate for use in most applications that would use copper or lead-coated copper. FreedomGray may be used not only for roofs, but also to form most architectural accents, gutters, downspouts and other rainwater carriers, and wall cladding.

Roofs and flashings using Revere's patented tin-zinc alloy have been exposed to industrial, seacoast, urban and rural environments without failure. Salt spray, salt fog and other accelerated weathering tests have also had no adverse effects. However, in some marine environments pitting may occur over time, please consult with Revere.

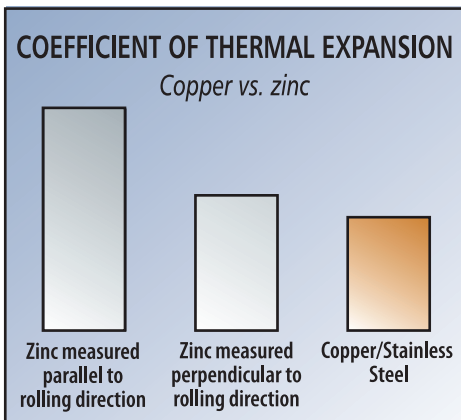
FreedomGray Satin T-Z Alloy™ is a practical choice for today's environmentally conscious clients.

## Handling Considerations

### Compatibilities

FreedomGray Satin T-Z Alloy™ is basically inert, allowing it to be used with most other architectural metals. When in doubt, contact Revere's Technical Advisory Service for

answers about the nobility and electrochemical potential of certain metals.



In most environments and applications, FreedomGray Satin T-Z Alloy™ will not stain other materials below them. However, drip edges and overhangs should still be designed to minimize water staining.

If desired, FreedomGray Satin T-Z Alloy™ may be painted without altering its physical properties.

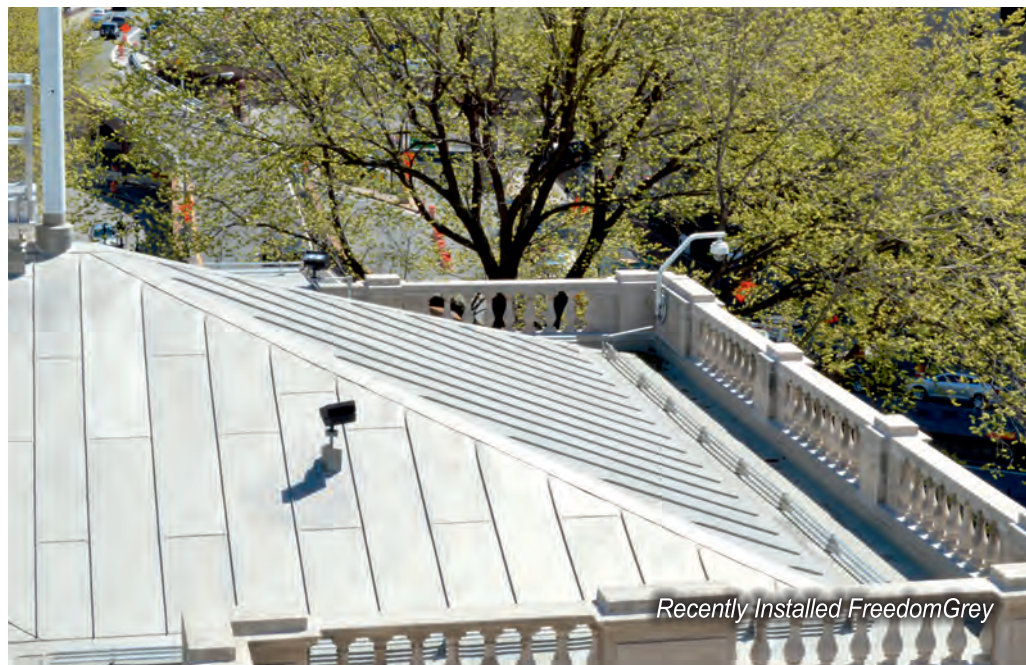
Inorganic acids, including hydrochloric acid, can damage FreedomGray Satin T-Z Alloy™. Steps should be taken to protect against runoff from acid-leaching substances, overspray from masonry cleaners (muriatic acid), tannic acid from some wood, and other acids.

Most commonly available underlayments may be used with these products. Before installing FreedomGray Satin T-Z Alloy™ with treated lumber, consult Revere and the lumber treater.

For safety, Revere always recommends the use of gloves and eye protection whenever handling any architectural metal.



*Matured FreedomGrey*



*Recently Installed FreedomGrey*





# Specifications

## Architectural Guide Specifications

Revere FreedomGray® and Satin T-Z Alloy™ is cut, bent, formed and installed using the same tools and techniques as with mill-finished copper. Complete details and specifications for the installation of architectural sheet copper are contained in the Revere manual *Copper & Common Sense*.

## MATERIALS:

### Sheet Copper

All FreedomGray sheet copper shall be standard, ounce-weight material conforming to ASTM specification B370.

Where FreedomGray Satin T-Z Alloy™ coated material is specified or noted on the drawings, copper shall be coated both sides with Tin/Zinc alloy a minimum of 0.0005" thick per side. Composition of the alloy shall be approximately 50% zinc and 50% tin with trace elements controlled for durability, corrosion resistance and color.

The T-Z Alloy™ shall be applied by the hot-dip process. All T-Z Alloy™ coated copper shall have a satin finish.

### Solder

Where used on T-Z Alloy™ coated copper, solder shall conform to ASTM specification B32 and shall be pure tin **OR** lead-free, high-tin. If leaded solder is allowed a 60% minimum of tin is required.

## WORKMANSHIP:

### Handling & Storage

Store FreedomGray Satin T-Z Alloy™ coated copper sheets, coils and formed shapes off the ground, in an enclosed structure. Do **NOT** store in a manner or location that would allow water or moisture to remain between sheets or shapes prior to installation. Do **NOT** store on bare ground under a tarp or in another manner that may cause condensation to form on or between sheets or shapes. Caution must be taken to avoid moisture in storage of sheets, coils, pans, gutters or fascia. Storage in wet conditions, high-moisture areas or where condensation occurs may cause surface staining or corrosion, this can occur quickly.

Handle sheets and shapes so as to minimize scratches, dents, etc.

#### COMMENTARY:

*In the absence of oxygen, standing water may cause water stains and, in severe cases, corrosion. Water stains and surface scratches should not affect the life or durability of FreedomGray Satin T-Z Alloy™; however, they can be aesthetically unattractive.*

## Soldering

Before soldering T-Z Alloy coated copper, surfaces to receive soldering should be chemically and/or mechanically cleaned to produce clean, bright alloy.

#### COMMENTARY:

*To ease soldering, a tin-bearing flux may be applied to all surfaces to receive solder.*

## Installation

Except as noted elsewhere, form and install FreedomGray Satin T-Z Alloy™ as noted on the drawings and in the same manner as described for plain copper in Revere's sheet copper design manual *Copper & Common Sense*, latest edition.

## Protection

FreedomGray Satin T-Z Alloy™ shall be protected during installation and cleaning of masonry with tarps, polyethylene sheeting or similar impervious materials. To prevent water stains due to condensation trapped on the metal's surface, protection must be removed at the end of each workday.

## Cleaning

Remove excessive dirt and construction debris by washing thoroughly with clear water. Grease, oils, etc. may be removed by washing with alkaline commercial cleaning agent in hot water. Do not otherwise chemically or mechanically clean FreedomGray Satin T-Z Alloy™.

## Available Forms of FreedomGray

Types	Sheets and coils
Weights	16-oz.; 0.0216" thick 20-oz.; 0.027" thick 24-oz.; 0.032" thick 32-oz.; 0.043" thick
Temper	H00-H01 – cold rolled
Stock sizes	36"x 120" x 16-oz. sheets 36"x 96" x 16-oz. sheets 36"x 120" x 20-oz. sheets 36"x 96" x 20-oz. sheets 500 lin. ft. coils of 20" and 24" wide, 16-oz. and 20oz.

**NOTE:** Other sizes and corresponding lead times available on request.

## ORDERING INFORMATION:

### Price

FreedomGray Satin T-Z Alloy™ are priced at a premium above Revere's Classic Copper finish. Contact your local Revere distributor for prices and lead times.

### Minimum Order Quantity

One standard case or coil

### Availability

Through Revere sheet copper distributors throughout the U.S., Canada and South America.

## FreedomGray Satin T-Z Alloy™

### Warranty

Revere warrants that, for a period of 25 years after delivery, with the exception of coastal areas within 1 mile of a salt water environment, FreedomGray Satin T-Z Alloy™ will comply with the written specifications accepted by Revere and will be free of defects in workmanship and materials for a period of 10 years.

Call Revere for complete warranty details.

### Technical Guidance

If you have questions or concerns about the use of FreedomGray Satin T-Z Alloy™ on a particular project, please call (800) 448-1776, ext. 2554.

### Do NOT Use FreedomGray Satin T-Z Alloy™

- 1) Below plain or pre-patinated copper
- 2) In areas subject to impingement (e.g., in areas where water falls off a higher roof onto FreedomGray Satin T-Z Alloy™)
- 3) In areas of concentrated or abrasive flow (such as in valleys on slate or tile roofs)
- 4) Below or next to Cedar, or any natural acid bearing woods without a surface protection of a temporary clear or colored latex paint. This paint should provide suitable protection for the Tin / Zinc coating for 1 year minimum.
- 5) Where treated lumber is in contact with our material or where runoff from treated lumber flows onto our material.
- 6) Consult your wood manufacturers and follow their recommendations for product suitability. Wood treatments applied by manufacturers change frequently, you must make sure to follow current recommendations.

### Cautionary Uses

- 1) Interior applications where oxidation of the T-Z alloy coating may not occur in a short period of time due to its limited exposure.
- 2) Soffits and similar "protected" applications where weathering will be extremely slow.



**Revere Copper Products, Inc.**  
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## ARCHITECTURAL GUIDE SPECIFICATIONS

The following are parts of a guide specification for incorporation into architectural specifications. Complete details, specifications and descriptive text for the installation of copper roofs, gutters, flashings, etc., are contained in the Revere manual *Copper & Common Sense*.

### General

#### QUALITY ASSURANCE

Unless otherwise shown or specified, comply with applicable recommendations and details in *Copper & Common Sense* by Revere Copper Products, Inc.

### Products

#### Material Data

##### Physical Properties

Atomic wt.	63.54
Specific gravity	8.89 to 8.94
Density	.0322lb./cu.in.
Coefficient of thermal expansion	0.0000098

Thickness	Theoretical	Minimum	Wt/Sq. Ft
16 oz.	0.0216"	0.0204"	1.00 lb.
20 oz.	0.0270"	0.0258"	1.25 lb.
24 oz.	0.0323"	0.0308"	1.50 lb.
32 oz.	0.0431"	0.0411"	2.00 lb.

Mechanical properties	Temper designation			
	Soft	Cold-rolled		
	060	H00	H01	H02
Tensile strength	30-38	32-40	34-42	37-46
Yield strength	-	20	28	30
Elongation	45%	30%	25%	10%
Rockwell F Scale	65	54-82	60-84	77-89

#### MATERIALS

A. Copper- Select copper or coppers as required for aesthetics.

1. **Standard sheet copper:** cold rolled ounce weight (12-ounce, 16-ounce, 20-ounce, and/ or 32-ounce as noted on drawings) copper sheet complying with ASTM B370. Unless otherwise noted, temper shall be H00.

2. **ContinentalBronze:** Our pre-aged copper is shipped with a natural brown/bronze copper oxide finish. This material has no chemicals on the surface and will patina over time, in most environments the copper surface will eventually weather to a green patina.

3. **Tin-zinc alloy coated copper:** cold rolled ounce weight (12-ounce, 16-ounce, and 20-ounce as noted on drawings) copper coated both sides with tin-zinc alloy. Base copper sheet or coil shall comply with ASTM B370. Finish and appearance shall be that of Revere **FreedomGray™**.

4. **Pan-forming copper:** cold rolled ounce weight (12-ounce, 16-ounce and/ or 20-ounce as noted on drawings) copper in coil complying with ASTM B370 and manufactured in accordance with specifications for Revere **Ultrapan™**.

5. **Textured copper:** Solid copper having a designated minimum copper content of 99.5% or higher, in thickness ranging from .008" to .135", as specified on drawings. Finish and appearance shall be that of **Liberty Collection™ Rigidized©** textured copper.

6. **Copper composite panel:** Thermoplastic core coated both sides with lightweight copper sheet, with a protective film on exterior skin. Total thickness shall be 4mm or 6mm as specified on drawings. Finish and appearance shall be that of Revere **Alpolic Composite Panel™**.

B. Solder- shall conform to ASTM B32.

For **FreedomGray** tin/zinc alloy coated copper- Pure tin or lead-free, high-tin solders such as Number 497 by Johnson Manufacturing.

C. Fasteners- for plain copper, **Continental Bronze** and **FreedomGray** tin/zinc alloy coated copper shall be copper, copper alloy or non-magnetic, series 300 stainless steel.

### Execution

#### STORAGE AND COORDINATION

A. Store all architectural copper sheet and coils (plain/bare, Continental Bronze, and /or FreedomGray) off the ground in an enclosed structure so as to maintain dry conditions and exclude condensation. Do not store on bare ground under tarp.

B. Handle sheets and formed shapes in a manner to reduce scratches.

**Note:** The use of gloves may minimize fingerprints during initial weathering. Fingerprints fade and disappear with addition weathering. However, in arid locations they may persist for an extended period.

#### INSTALLATION

A. Except as otherwise shown or specified, comply with Revere Copper Products, Inc. recommendations and instructions as published in *Copper & Common Sense* and published Revere literature.

B. Separate and protect dissimilar metals as recommended by manufacturers of dissimilar metals (other than copper).

C. Solder plain/bare copper or **FreedomGray** in accordance with instructions published by Revere Copper Products, Inc.

**Note:** Prior to soldering plain/bare copper, **ContinentalBronze** or **FreedomGray**, areas to be soldered must be mechanically cleaned to produce a bright, unoxidized surface. Plain/bare copper and **ContinentalBronze** should be pre-tinned before soldering. It is not necessary to remove the tin-zinc alloy coating from the **FreedomGray**.

#### CLEANING

Do **not** chemically or abrasively clean plain/bare copper, **ContinentalBronze** and/or **FreedomGray**. If necessary, construction dirt may be washed from copper with clean, fresh water only. Do **not** use soaps, detergents or other cleaning agents.

#### PROTECTION

Protect plain/bare copper, **ContinentalBronze** and/or **FreedomGray** from oils, greases, masonry cleaning compounds, iron and steel fines and fasteners, and other construction materials that may stain or discolor copper surface. To minimize condensation or water stains, at the end of each workday, remove tarps or other protections placed on copper. Manufacturing representatives are available for assistance or on-site meetings.

**Refer to current manufacturer's SDS for safety and handling information.**



**Revere Copper Products, Inc.**

One Revere Park, Rome, NY 13440-5561

For technical assistance:

1-800-448-1776 ext. 2554

[www.reverecopper.com](http://www.reverecopper.com)

email:archcopper@reverecopper.com

Revere Liberty Collection, FreedomGray, ContinentalBronze, Ultrapan and Revere Classic Copper are trademarks of Revere Copper Products, Inc.

Alpolic Composite Panel is a trademark of Mitsubishi Chemical America. Rigidized is a registered trademark of Rigidized Metals Corporation. ZT/TZ alloy is a trademark of Revere Copper Products, Inc.

# GRACE ULTRA™ (US Version)

Butyl underlayment designed for extreme temperature roof assemblies

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## Product Description

GRACE ULTRA™ butyl roofing underlayment is composed of two waterproofing materials—an aggressive 100% butyl rubber adhesive backed by a layer of high density cross laminated polyethylene film. The product is 30 mils (0.76 mm) thick making it easy to handle and apply. The unique, advanced adhesive formulation offers premium adhesion to the roof deck, high quality laps, superior seal around roofing fasteners, and unrivaled high temperature stability. The adhesive is backed by a protective plastic release liner that protects its adhesive quality. The release liner is easily removed allowing the adhesive to be bonded tightly to the roof deck. The membrane comes in a 198 ft<sup>2</sup> (18.4 m<sup>2</sup>) roll, and measures 34 in. (864 mm) wide.

## Features & Benefits

- Heat resistance—The butyl adhesive is specially formulated to withstand temperatures up to 300° F .
- Seals around fasteners — The butyl adhesive layer in GRACE ULTRA™ membrane seals around roofing fasteners, resisting leakage caused by water back-up behind ice dams, and from wind-driven rain.
- Strong adhesion to the roof deck—The 100% butyl adhesive bonds firmly to the roof deck.
- High Quality Laps — The membrane forms watertight overlaps without special treatment.
- Better Chemical Compatibility — Compatible with low slope roofing materials such as EPDM and TPO.
- Plastic release — Plastic is easy to remove and easy to dispose of.
- Application Expertise — GRACE ULTRA™ comes from the makers of GRACE ICE & WATER SHIELD®, and is backed by a team of local technical support personnel to ensure every application goes smoothly.

## Guidelines for Use

GRACE ULTRA™ membrane is designed to withstand the highest in-service temperatures for extended periods of time. It can be used as a sloped roof underlayment to help protect against leakage from water that builds up behind ice dams, or from wind-driven rain in applications.

## High Temperature Applications

GRACE ULTRA™ membrane is the appropriate product for all applications where superior heat resistance is needed. In addition, GRACE ULTRA™ underlayment is the appropriate product for use under certain types of metal roofs (those employing copper, zinc, or COR-TEN®panels). These metal roofs tend to readily conduct heat to the underlayment making them more likely to expose the membrane to extreme temperatures. Many factors including climate, elevation, roof slope, color, roof covering material, ventilation, and insulated roof decks affect membrane service temperature requirements. It is up to the contractor and specifier to decide what level of performance is required based on the guidelines provided.

## Wind-Driven Rain

Sloped roofs are not waterproof. They protect structures by shedding rain water. Storm-driven winds can cause sloped roof coverings to lift. Rain can be easily driven under the roof covering directly to the unprotected deck where it causes leaks and damage to the interior of the structure. GRACE ULTRA™ membrane applied beneath the sloped roof covering helps prevent wind-driven rain from entering the structure. For wind-driven rain protection, full coverage with GRACE ULTRA™ underlayment is recommended. Since GRACE ULTRA™ underlayment is a vapor barrier, the roof construction must allow for proper ventilation in full roof coverage applications.

## Ice Dams

For ice dam protection, GRACE ULTRA™ membrane should be adhered at the edge of the roof deck by the eaves. The membrane should be applied to a point on the roof deck above the highest expected ice dam. Several variables influence the height of ice dams and the membrane coverage required. Local building codes should be consulted for specific requirements. Variables influencing the height of ice dams include climate (particularly the annual snowfall), slope, overhang, valleys, how well the structure is insulated and ventilated, and exposure (sun vs. shade). In addition to placement along the eaves, GRACE ULTRA™ membrane can be used to help prevent roof leaks in danger zones such as valleys, at the rake edges, and around chimneys and skylights.

## Installation Procedure

### Surface Preparation

Install GRACE ULTRA™ membrane directly on a clean, dry, continuous structural deck. Some suitable deck materials include plywood, wood composition, wood plank, metal, concrete, or gypsum sheathing. For all other substrates, contact your local GCP Applied Technologies sales representative. Remove dust, dirt, loose nails, and old roofing materials. Protrusions from the deck area must be removed. Decks shall have no voids, damaged, or unsupported areas. Repair deck areas before installing the membrane. (Refer to Tech Letter #5, *Chemical Compatibility*, when installing over wood plank decks.)

Prime concrete, masonry surfaces and DensGlass Gold® with PERM-A-BARRIER®WB PRIMER. Prime wood composition and gypsum sheathing with PERM-A-BARRIER®WB PRIMER if adhesion is found to be marginal (refer to Technical Letter 12, *Use on Oriented Strand Board (OSB) Roof Sheathing*). Apply PERM-A-BARRIER®WB PRIMER at a rate of 250–350 ft<sup>2</sup>/gal (6–8 m<sup>2</sup>/L). Priming is not required for other suitable surfaces provided that they are clean and dry.

### Membrane Installation

Apply GRACE ULTRA™ membrane in fair weather when the air, roof deck, and membrane are at temperatures of 40 °F (5 °C) or higher. Apply roof covering material at temperatures of 40 °F (5 °C) or higher.

Cut the membrane into 10–15 ft (3–5 m) lengths and reroll loosely. Tack/secure the end of the roll with a nail. Peel back 1–2 ft (300–600 mm) of release liner, align the membrane, and continue to peel the release liner from the membrane. Press the membrane in place with heavy hand pressure. Side laps must be a minimum of 3.5 in. (90 mm) and end laps a minimum of 6 in. (150 mm). For valley and ridge application, peel the release liner, center the sheet over the valley or ridge, drape, and press it in place. Work from the center of the valley or ridge outward in each direction and start at the low point and work up the roof.

Alternatively, starting with a full roll of membrane, unroll a 3–6 ft (1–2 m) piece of membrane leaving the release liner in place. Align the membrane and roll in the intended direction of membrane application. Carefully cut the release liner on top of the roll in the cross direction being careful not to cut the membrane. Peel back about 6 in. (150 mm) of the release liner in the opposite direction of the intended membrane application exposing the black adhesive. Hold the release liner with one hand and pull the roll along the deck with the release liner, leaving the applied membrane behind. Use the other hand to apply pressure on the top of the roll. Stop frequently to press the membrane in place with heavy hand pressure. When finished with the roll go back to the beginning, reroll and pull the remaining release paper from the material, finishing the installation.

Consistent with good roofing practice, install the membrane such that all laps shed water. Always work from the low point to the high point of the roof. Apply the membrane in valleys before the membrane is applied to the eaves. Following placement along the eaves, continue application of the membrane up the roof. The membrane may be installed either vertically or horizontally.

Use smooth shank, electroplated galvanized nails for fastening shingles. Hand nailing generally provides a better seal than power activated nailing. If nailing of the membrane is necessary on steep slopes during hot or extreme cold weather, backnail and cover the nails by overlapping with the next sheet.

Extend the membrane on the roof deck above the highest expected level of water back-up from ice dams and above the highest expected level of snow and ice on the wall sheathing on vertical side walls (dormers) and vertical front walls for ice dam protection. Consider a double layer of membrane in critical areas, such as along the eaves or in valleys and in climates where severe ice dams are anticipated. Apply the membrane to the entire roof deck for wind-driven rain protection. Apply a new layer of GRACE ULTRA™ underlayment directly over the old GCP self-adhered underlayment (GCP granular underlayments) in retrofit applications following the standard membrane application procedure.

### Precautions & Limitations

- Slippery when wet or covered by frost.
- Consistent with good roofing practice, always wear fall protection when working on a roof deck.
- Release liners are slippery. Remove from work area immediately after membrane application.
- Do not leave permanently exposed to sunlight. Maximum recommended exposure is 120 days.
- Place metal drip edges or wood starter shingles over the membrane.
- Place metal drip edges or wood starter shingles over the membrane (refer to Technical Letter 15, *Roof Eave Application*).
- Do not fold over the roof edge unless the edge is protected by a drip edge, gutter, or other flashing material.

- Do not install on the chamfered edges of wood plank.
- Do not install directly on old roof coverings.
- Check with the manufacturer of the metal roofing system for any special requirements when used under metal roofing. Maintain an air space between the membrane and roof coverings that are especially moisture sensitive (such as zinc) as per the metal suppliers requirements.
- Provide proper roof insulation and ventilation to help reduce ice dams and to minimize condensation. GRACE ULTRA™ underlayment is a vapor barrier.
- Repair holes, fishmouths, tears, and damage to membrane with a round patch of membrane extending past the damaged area 6 in. (150 mm) in all directions. If fasteners are removed leaving holes in the membrane, they must be patched. The membrane may not self-seal open fastener penetrations.
- Do not install fasteners through the membrane over unsupported areas of the structural deck, such as over the joints between adjacent structural panels.
- Due to its slight rubber-like odor, do not apply where the membrane is exposed to interior living space.
- Compatible with EPDMs and TPO low slope membranes (refer to Technical Letter 5, *Chemical Compatibility*). Use for tie-ins between EPDM or TPO membranes and other GCP self-adhered underlayments.
- Not compatible with polysulfides, flexible PVC, or high concentrations of resin (pitch) that may be found in some wood plank decks. For more information, refer to Technical Letter 5.

## Standard Compliance

GRACE ULTRA™ meets the following standards:

- ICC ESR-1677 approval according to AC-48 Acceptance Criteria for Self-Adhered underlayments used as Ice Barriers
- Underwriters Laboratories, Inc. R13399 Class A fire classification under fiberglass shingles and Class C under organic felt shingles
- Underwriters Laboratories, Inc. Classified Sheathing Material Fire Resistance Classification Design Numbers P225, P227, P230, P237, P259, P508, P510, P512, P514, P701, P711, P717, P722, P723, P732, P734, P742, P824

## Product Data

Roll length	70 ft (21.3 m)
Roll width	34 in. (864 mm)
Roll size	198 ft <sup>2</sup> (18.1 m <sup>2</sup> )
Packaging	Corrugated cartons
Roll weight	42 lbs (19.0 kg)
Rolls per pallet	25

## Performance Properties

PROPERTY	VALUE	TEST METHOD
Color	Gray-black	
Thickness, membrane	30 mil (0.76 mm)	ASTM D3767 method A
Tensile strength, membrane	250 psi (1720 kN/m <sup>2</sup> )	ASTM D412 (Die C modified)
Elongation, membrane	250%	ASTM D412 (Die C modified)
Low temperature flexibility	Unaffected @ -20 °F (-29 °C)	ASTM D1970
Adhesion to plywood	3.0 lbs/in. width (525 N/m)	ASTM D903
Permeance (max)	0.05 Perms (2.9 ng/m <sup>2</sup> s Pa)	ASTM E96
Material weight installed (max)	0.22 lb/ft <sup>2</sup> (1.1 kg/m <sup>2</sup> )	ASTM D461
Adhesive	100% Butyl Rubber Adhesive - Contains no asphalt	

[gcpat.com](http://gcpat.com) | North America customer service: 1-866-333-3726

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Last Updated: 2019-05-24

[gcpat.com/solutions/products/grace-ice-water-shield-roofing-underlayment/grace-ultra](http://gcpat.com/solutions/products/grace-ice-water-shield-roofing-underlayment/grace-ultra)



NO. 763

Project: Re-Roof - MIT Endicott House  
Contractor: WS Aiken  
Spec Section: 076119 - Flat Seam Sheet Metal Roofing  
Paragraph: 2.2E  
Notes:

MasteFormat: 07 72 00



MAY 2019  
(Supersedes March 2015)

## RED ROSIN PAPER

### Multi-Purpose Building Paper

#### DESCRIPTION

RED ROSIN PAPER is a high quality, single-ply sheathing paper, which is widely used in built-up roofing systems as a “first layer” protective barrier. This environmentally friendly paper is manufactured from 100% recycled fibers. The fibers are set in alum to resist bleeding. It is a multi-purpose building paper used as a physical barrier protection throughout all phases of general construction.

#### USES

RED ROSIN PAPER is useful in a wide variety of construction applications, including roofing, flooring, and as a general jobsite protective covering. When used as an inner liner in wall, roofing, or wood flooring applications, RED ROSIN PAPER acts as a separation barrier, protecting against wind and dust infiltration, while minimizing squeaks. It is compatible with coal tar and asphalt-based roofing systems.

#### FEATURES/BENEFITS

- Economical protective covering over new floors, prior to completion/Saves time.
- Compatible with coal tar and asphalt-based roofing systems/Highly versatile.
- Covers gaps in jointed construction/Tightens up the structure.
- Specially designed to resist bleeding/Safe to use.
- Good general purpose jobsite protective utility paper/Multiple uses.

#### PACKAGING

36" wide x 167' long (.91 m x 50.90 m) rolls

#### COVERAGE

500 ft.<sup>2</sup>/roll (46.45 m<sup>2</sup>/roll)

#### TECHNICAL DATA

Size:	36" wide x 167' long (.91 m x 50.90 m)	
Weight:	12 lb./roll (5.4 kg/roll) 2.4 lb./CSF (117 g/m <sup>2</sup> )	Mil Thickness: 0.075 Mils
	15 lb./roll (6.8 kg/roll) 3.0 lb./CSF (141 g/m <sup>2</sup> )	Mil Thickness: 0.11 Mils

#### APPLICATION

**Surface Preparation ...** Clean surface of all dust, dirt and debris prior to installation.

**Application Method ...** Cut RED ROSIN PAPER to desired lengths from the roll. Overlap each piece 2.5" (63.5 mm). Once positioned, RED ROSIN PAPER is ready to receive subsequent applications.

#### PRECAUTIONS

Read and follow application information and precautions. Refer to Safety Data Sheet for complete health and safety information.

#### LEED INFORMATION

May help contribute to LEED credits:

- MRc9: Construction and Demolition Waste Management

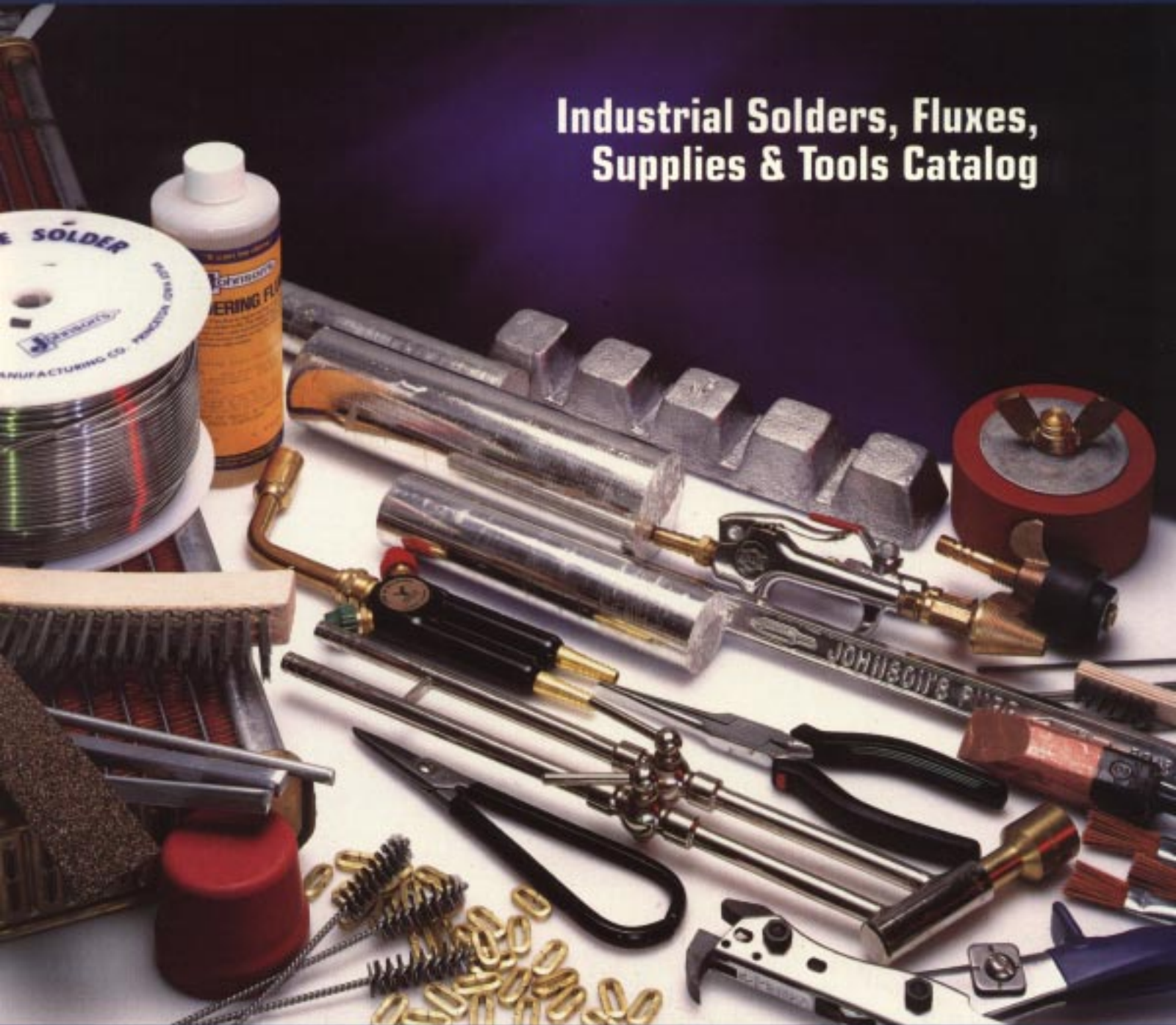
CONTINUED ON REVERSE SIDE ...



# JOHNSON

INNOVATION IN SOLDER TECHNOLOGY SINCE 1909

**Industrial Solders, Fluxes,  
Supplies & Tools Catalog**



**"It Can Be Done" *With* Johnson**



# SOLDERING SOLUTIONS

Since 1909

# SOLDERING FLUID

**J**ohnson's story began in St. Louis, Missouri in the late 1800's. This statement was provided by the late Charles W. Johnson, son of the late founder, Charles H. Johnson.

"The original Johnson's Soldering Fluid was developed as a result of the difficulty my father had in soldering laundry equipment which he manufactured and repaired. The galvanized cylinders of the washing machines posed a very difficult soldering problem." Besides making fluid for his own needs, the elder Johnson began giving it to his friends in the St. Louis area.

When he moved to Cedar Rapids, Iowa in the early 1900's his friends still wanted this unique soldering flux. In 1909 Johnson began marketing Johnson's Soldering Fluid and at that time he coined a slogan "It can be done", which has been used in conjunction with Johnson's logo ever since.

Today, Johnson produces one of the most complete lines of solders, fluxes and tinning compounds in the entire world. While our company is increasingly driven by new product development and technology, nonetheless, we pay strict heed to our founders commitment to provide "quality, consistency and uniformity" with every batch.



## JOHNSON'S SOLDERING FLUID

### The "Original" Soldering Fluid

The standard by which all other general purpose fluxes are compared, but never equaled. Prove to yourself that this is the one flux that will save you more time and money than any other. Far superior to salts or powder fluxes. Johnson's Soldering Fluid enables all solders to flow at their lowest possible temperature, yet it protects your work at higher temperatures without burning away. Your solder joints will be stronger and less solder will drop off your work.

Johnson's Soldering fluid contains no free acid. It is highly active when heated (becomes active at 150° F) yet it is nearly inactive when cold.

Johnson's Soldering Fluid will do more soldering per pound than any other flux, liquid or powder. Johnson's Soldering Fluid may be diluted; mix with equal volume of water for radiator repair; use full strength for tough jobs. Reapply extra flux while work is hot if necessary for the most difficult jobs. Residues wash off with water.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
Bench Btle	01-02	01-04	24	9#
Pint	01-07	01-08	12	19#
Quart	01-09	01-10	6	18#
Gallon	01-11	01-12	4	50#
5-Gallon	01-14	01-14		61#
15-Gallon	01-15	01-15		179#
55-Gallon	01-55	01-55		665#



# SOLDERING FLUXES

## LLOYD'S STAINLESS STEEL FLUX

*The Preferred Flux for all Stainless Steels*

Lloyd's Stainless Steel Soldering Flux is our most aggressive flux for soldering most difficult to solder metals except magnesium and aluminum. A truly outstanding flux (perhaps the finest of its type in the world) for all grades of stainless when using soldering coppers (irons); also solders chrome, and cast iron bearing shells, where other fluxes may fall short.

This balanced chemical and acid combination produces strong solder joints that are bright and shiny. Commonly used with all non-lead solders such as Johnson's 460 tin-silver for soldering food handling equipment, our new IA-423, tin-silver-copper ternary eutectic solder, 95/5 tin-antimony solder and all other common solders. Residues are water soluble and must be removed from the workpiece immediately after soldering.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
Quart	03-06	03-07	6	17#
Gallon	03-08	03-09	4	44#

## JOHNSON'S NO. 1 STAINLESS STEEL FLUX

*Our Best Flux for Torch Work on Stainless*

Johnson's No. 1 Stainless Steel Flux is an excellent flux for torch soldering stainless steels, monel, nickel and chrome. This balanced formulation starts to clean the instant it's applied, and continues throughout the soldering process.

Johnson's No.1 works well with non-lead solders and other solders as well. It can be diluted with water to become a more general purpose flux. Johnson's No. 1's residues are water soluble, yet remain active, therefore should be removed from the workpiece immediately after soldering.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
Quart	02-06	02-07	6	18#
Gallon	02-08	02-09	4	45#

## JOHNSON'S SOLDERING PASTE

*The "Original" Johnson Paste Flux for Sweat Joints*

Johnson's Soldering Paste contains a balanced formulation of inorganic chlorides in a pure petrolatum base. This grease type paste flux, known for its light color and soft composition has been preferred by many plumbers for sweat soldering copper joints and brass fittings. It becomes quite active when heated, to pull solder deep into the joints, yet it's residues are considered mild because they do not turn copper pipes green.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
3 Oz. Bottle	05-03	05-04	24	5#
1 Lb. Jar	05-09	05-10	24	30#

## WATER REMOVABLE SOLDERING PASTE

*NEW! Approved for all Potable Water Supplies*

Johnson's Water Removable Soldering Paste is biodegradable, non-hazardous and 100% cold water flushable. It contains no zinc or ammonium chloride, yet it improves the wetting and flow of all lead free solders. Exceeds ASTM B813-93 & CDA STM 1.0, as well as Federal Spec. A-A-51145C-92, Type 1, Form A.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
3 Oz. Bottle	05-23	05-24	24	5#
1 Lb. Jar	05-29	05-30	24	30#

## JOHNSON'S CRYSTAL GEL SOLDERING FLUX

*NEW! A Mild Chloride Formula for Stained Glass Work*

Johnson's Crystal Gel Soldering Flux is thicker, easier to apply, without running off the workpiece. It offers just the right combination of gentle fluxing activity and will not stain metals prior to soldering, yet it solders fast, leaving all joints bright and shiny. Excellent flux for copper foil work. Use with Johnson's IA-423 Lead-Free Solder for strongest possible joints.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
4 Oz. Bottle	04-20	04-21	24	9#
Quart	04-28	04-29	6	16#

# PRODUCTION FLUXES

## LLOYD'S NO. 14 MILD ORGANIC FLUX

*Lowest Residues for Dip Soldering*

Lloyd's No. 14 Organic Soldering Flux is a uniquely mild solution of free halides for soldering copper, brass, tin plate and other easy-to-solder metals. Leaves no corrosive residue afterwards. Commonly used for soldering stained glass articles with lead or brass came, dip soldering cable ends, architectural copper roofing and many other applications.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
Gallon	04-61	04-62	4	40#
5 Gallon	04-64		1	49#

## LLOYD'S NO. 6 SOLDERING FLUID

*A Low Staining Flux*

Lloyd's No. 6 Soldering Fluid is an ideal flux for soldering brass, copper, steel, lead, tinplate, terne plate and other coated metals. Uses include production soldering of stained glass lamp shades, brass musical instruments, and other products where a low staining flux is desirable. Lloyd's No. 6 may be diluted and its residues are easily removed with water.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
Quart	06-04	06-05	6	18#
Gallon	06-06	06-07	4	46#
15 Gallon	06-09			166#

## J-33 FLUX FOR GALVANIZED METALS

*Produces Strong Joints with Minimal Staining*

Johnson's J-33 Liquid Flux for Galvanized is an active chloride formulation, with the power to handle the toughest galvanized jobs. J-33 is used with Johnson's non-lead Galvanized Repair Alloy and a torch for repairing galvanized surfaces, or with 50/50 low-antimony solder and a soldering iron for sheet metal seams. J-33's residues are active and should be removed immediately after soldering to prevent dulling of coated metals.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
Quart	30-05	30-06	6	17#
Gallon	30-02	30-03	4	43#
15 Gallon	30-04			162#

## BIO-SAFE SOLDERING FLUX

*Biodegradable, Organic,  
Neutral pH, Non-Toxic*

Like Johnson's Bio-Bake described on the next page, Bio-Safe is an environmentally friendly flux, but with a slightly lower active temperature range, approximately 650°F. Bio-Safe's residues are non-corrosive and need only to be removed for cosmetic purposes.



ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
3.5 Fl. Oz.	45-03	45-04	24	8#
Gallon	45-09	45-10	4	46#

It Can  
Be Done  
With  
**JOHNSON**



## ANTI-DROSS SOLDER POT WAFERS

*Returns up to 75% of Oxides to Metal*

Johnson's Anti-Dross Solder Pot Wafers help you recover metal from your dross before skimming a solder pot. When properly introduced to the pot, this dross reducer brings dirt to the surface, and returns oxides into solder. All that's left is a powdery dust to be skimmed off.



ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
2 Oz. Ea.	41-50	41-51	24	4#

## JOHNSON'S ACTIVATED ROSIN FLUX

*Non-Corrosive (RA Type) Flux*

Johnson's Rosin Flux is most often used for soldering electrical terminals, architectural roofing and metals that are easy-to-solder such as copper and pretinned brass. Residues are not considered corrosive yet they may be removed for appearance.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
Gallon	27-04	27-05	4	33#

## ALUMAWELD SOLDERING FLUXES

Johnson's Alumaweld Fluxes are available as a slurry mixture in small jars, or as a powder in bulk form for production soldering of aluminum and its alloys.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
1/4 Lb. Btle.	48-02	48-03	12	4#
500 Lb. Drum	45-31		1	535#

## BIO-BAKE RADIATOR CORE BAKING FLUX

*Biodegradable, Organic, Neutral pH, Non-Toxic*

Johnson's BioBake Soldering Flux is nothing short of revolutionary! This organic, production flux is non-toxic, biodegradable and neutral. In a tank, BioBake does not become depleted with time because it does not rely on free acid for its fluxing power. Instead, its chemicals are released only when heat is applied. Flux tanks that are properly filtered, should not have to be changed, so you don't have to ship spent flux off-site to be disposed of.

BioBake's organic salts remain active well over 700°F. Excellent results are achieved at higher temperatures and the oven dwell time is shortened, for example 680° F for 2 minutes. Residues are non-corrosive.

ITEM	PART NO.	SHIP WT.
5 Gallon	45-64	57#
15 Gallon	45-65	147#

## C-71-2 CORE BAKING FLUX CONCENTRATE

*Organic Flux for Strongest Bonds, Cleanest Cores*

Johnson's C-71-2 Core Baking Flux is a powerful organic flux for baking radiator cores in batch or conveyor ovens. Properly diluted at 8:1 with clean water this flux produces excellent tube-to-fin bonds across the full width of the tube. C-71-2 bakes clean, giving a uniform pink color to all cores. After soldering occurs, C-71-2 volatilizes, leaving no corrosive residues.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
Gallon	28-02	28-03	4	43#
15 Gallon	28-04		1	160#

## WELL-BAKE CORE BAKING FLUX

*Fortified with Chlorides to Extend Active Range*

Johnson's Well-Bake Core Baking Flux is an aggressive organide flux that offers an extended active temperature range. Most often used for baking industrial radiators, hard-to-bake cores or when torches are used for soldering the tube-to-fin bond. Well-Bake contains chlorides, yet leaves very little corrosive residue behind. Suggested dilution is 10:1.

ITEM	PART NO.	SHIP WT.
15 Gallon	28-14	161#

## BLACKSTONE™ 3345 FLUX

*Strong Inorganic Acid Flux for Tinning*

Offers a high degree of activity and has excellent wetting characteristics. May be used for high-speed tinning of brass strip or steel wire. Also effective with a soldering iron or torch.

ITEM	PART NO.	SHIP WT.
15 Gallon	09-55	615#

*\*Johnson Mfg. Co is an authorized distributor of Blackstone Fluxes manufactured by Kester Solder Co., Div. Litton Industries. In addition to our own selection of fluxes, we can offer Blackstone technology to help solve any industrial soldering problem.*

## SAFE FLUX-14 HEADER DIPPING FLUX

*Organic Flux Cleans, Wets Large Areas*

Johnson's Safe Flux-14 Header Dipping Flux is designed primarily for dip soldering tube-to-header joints and coated side channels in copper/brass radiator assemblies.

This active flux wets the entire header surface, promotes very strong solder bonds, and leaves no corrosive residues after soldering temperatures are reached. Typical dilution is 1:1.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
Gallon	18-02	18-03	4	42#
15 Gallon	18-05		1	155#

## WELL-DIP SOLDERING FLUX

*Organide Dipping Flux Fortified with Chlorides*

Johnson's Well-Dip Header Dipping Flux is an organide flux that offers the extended temperature range of a chloride formula but like an organic, it leaves very little residue after soldering.

Handles extended dwell times needed to solder large industrial radiators and/or when solder pot temperatures set high due to low solder capacity.

ITEM	PART NO.	SHIP WT.
15 Gallon	18-75	156#

## DELTA TUBE MILL FLUX

*Super Fast Wetting Action for High-Speed Mills*

Johnson's Delta Tube Mill Flux is a very effective organic flux for today's high speed soldering operations such as strip tinning and tube mills. Its unique wetting system insures fast, complete coverage. Dilution with up to 4 parts of clean water is possible. Delta's high speed tinning action and rapid evolution leaves the inside surfaces of radiator tubing very clean and residue free.

ITEM	PART NO.	NO. IN CASE	SHIP WT. CASE
15 Gallon	19-15	1	157#

## B-118 ORGANIC SOLDERING FLUX

*Our Most Aggressive Organic Flux for Torch Work*

Johnson's B-118 Organic Soldering Fluid is a highly concentrated organic acid flux, commonly used for production soldering of new radiators and heater cores. When heated to soldering temperatures, B-118's residues are rendered inactive. No harmful green or blue residues remain to corrode radiators during periods of storage. The standard dilution for dip soldering is 4 parts water to 1 part flux, for torch soldering use 1:1 or use full strength for tough jobs.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
Gallon	17-03	17-04	4	43#
15 Gallon	17-15		1	160#
55 Gallon	17-55		1	580#

# PASTE SOLDERS



## JOHNSON'S FLO-RITE™ PASTE SOLDERS Smooth Flux and Alloy Formulations

Johnson's Flo-Rite family of paste fluxes are engineered to provide a wide range of activation levels, temperature ranges and viscosities to meet today's production soldering requirements. Whether combined with non-leaded or tin/lead solder powder, the result is always a smooth, dispensable paste solder that will compliment your soldering operation.

Typical applications include soldering automotive components, appliance manufacturing, ice making machines, pumps, valves and many other products. Residues are water soluble and are easily removed. Please tell us your requirements so we can blend the paste solder that is just right for your application.

F-610 is an active flux formulation which we stock in the following popular alloy combinations, while F-611 is less active for easier-to-solder components and where residues are more difficult to remove.

FORMULA	SINGLE PART NO.	NO. IN CASE	SHIP WT. CASE
F610, F611			
4 Lb. Jar	F610-87-5050-04	8	35#
1 Lb. Jar	F610-87-6040-01	12	14#
1 Lb. Jar	F610-87-9505-01	12	14#
1 Lb. Jar	F611-67-5050-01	12	14#

*\*Flo-Rite is a registered trademark of Kester Solder Company, Division of Litton Industries.*

## E-127 FLUX-'N-SOLDER with PURE TIN Fastest Tinning for Most Common Metals

Johnson's E-127 Flux-'N-Solder with Pure Tin is the ideal blend of mild chlorides in paste form, mixed with pure tin powder to create a versatile tinning compound. E-127 is widely used by service shops for pretinning cast iron bearing shells, prior to babbitting. It is also used in the restoration of antique cars before adding body solder, and for pretinning parts to be later assembled and then soldered with a non-corrosive flux.

Johnson's E-127 has a melting temperature of 450°F and is compatible with all solders. It's residues are water soluble and should be removed after soldering.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
1 Lb. Jar	16-02	16-03	12	14#
4 Lb. Jar	16-04	16-05	6	26#

## 95/5 (Tin/Antimony) FLUX-'N-SOLDER Proven Best for Lead-Free Plumbing

Johnson's 95/5 tin/antimony Flux-'N-Solder is a very smooth, non-leaded paste solder. In addition to being used for potable water systems, it is often used for soldering stainless steels, for high temperature or underground applications and where increased joint strength is necessary.

Like other Johnson Flux-'N-Solders, it is very easy to apply and holds in the joint to provide uniform pretinning when heat is applied. Melting temperature is 450 to 464°F. When tinning occurs, 95/5 wire solder should be added to insure a full joint.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
1 Lb. Jar	15-02	15-03	12	14#

## 50/50 (Tin/Lead) FLUX-'N-SOLDER Paste Solders have Many Industrial Uses

Many industrial uses still exist for this easy-to-use Flux-'N-Solder combination. Unlike E-127, this formula contains 50/50 powdered solder (50% lead), and therefore must not be used when soldering drinking water systems, food handling equipment, livestock tanks, etc.

Due to its relatively low melting temperature (360 to 420 °F) and its rapid tinning action, this paste is excellent for soldering automotive components and other assemblies. Residues are water soluble and should be removed after soldering.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
1 Lb. Jar	10-07	10-08	12	14#

## 60/40 (Tin/Lead) FLUX-'N-SOLDER Johnson's (RA Type) Rosin Flux Formula












Johnson's 60/40 C-7 Rosin Flux-'N-Solder is an excellent medium-tech, non-corrosive paste solder for electrical connections, and other easy-to-solder components. Melting range is 360 to 374°F.

ITEM	SINGLE PART NO.	CASE PART NO.	NO. IN CASE	SHIP WT. CASE
1 Lb. Jar	13-02	13-03	12	14#

# Johnson's PURE Lead-free Solders

For Plumbing, Radiators, Valves and other Manufacturing, Commercial and Industrial Soldering Applications.

## Johnson's Lead-Free Alloys

Alloy	Composition	Solidus °F	Liquidus °F	Shear PSI	Uses
TIN	Sn (99.95)	450	450		
#399	Sn/5Sb	450	464	4583	
#1A-421	Sn/3.8Ag/.7Cu <sub>(p)</sub>	423	423	5091	
#1A-423	Sn/4.7Ag/1.7Cu	423	423	5874	
#1A-425	Sn/Ag/Cu <sub>(p)</sub>	423	423		
#460	Sn/3.5Ag <sub>(e)</sub>	430	430	5408	
#466	Sn/4Ag	430	444		
#469	Sn/5Ag	430	464		
#495	Sn/Cu/Ag <sub>(p)</sub>	437	660	4641	
#465	Sn/Cu/Sb/Ag <sub>(p)</sub>	437	447	5149	
#497	Sn/Sb/Cu/Ag <sub>(p)</sub>	419	452	5294	
#574	Sn/3Cu	446	619	4192	
#576	Sn/1.5Cu	446	505	3974	
#577	Sn/2Cu	446	540		
#579	Sn/.7Cu <sub>(e)</sub>	446	446	3911	

(e) - eutectic alloy

(p) - proprietary composition



Johnson's selection of Lead-Free Solders is one of the finest anywhere, offering unique properties that enable the best performance for a given application.

Johnson's **#399**, 95/5 tin-antimony solder, has been used by plumbers for many years due to its low cost and acceptable performance.

We recommend **#497** as stronger and easier to use for sweating joints in potable water (plumbing) systems, water valves, roofing, plus many other production soldering applications. It is available in extruded bar, meter bar ( $\frac{3}{8}$  x  $\frac{3}{8}$  x 15 inches), micro bar ( $\frac{1}{4}$  x  $\frac{1}{4}$  x 15 inches) and wire.

Johnson's **#574**, and **#579** are economical, practical and reliable alloys found within the binary tin-copper family of solders. All are compatible, yet each offers a unique melting range, which is good for handling multiple soldering tasks, much the same way you can use different solders from the lead-tin group.

***Silver Bearing Alloys, distinguished by their Silver Content (Ag) from 0.5 to 5.0%, offer high strength and excellent wettability.***

Silver Bearing Solders, not to be confused with silver solders (brazing alloys), offer certain physical properties unsurpassed by other lead-free solders. With very few exceptions, they provide superior strength, wettability and corrosion resistance for soldering copper, brass, steel, etc., along with a good bond and color match with most grades of stainless. Johnson's **#IA-423**, ternary (3-element) tin-silver-copper eutectic alloy, as well as similar alloys such as **#IA-421**, which contains less silver and copper, and **#IA-425**, the shiniest solder we've ever seen, (we call it SilverGlo™), provide subtle differences for certain heating methods, or soldering applications, etc.. These alloys, and a few others fall within what is referred to as a "narrow eutectic trough,".

Our most popular solder within the binary (2-element) tin-silver family of solders is Johnson's **#460**, which is a eutectic alloy that melts at 430 degrees F (221 C). Johnson's **#495** has the widest melting range of any silver bearing solder within our standard alloy offerings. Its primary use is for plumbing.

**ALL JOHNSON PURE LEAD-FREE SOLDERS CONTAIN LESS THAN 0.05% LEAD, 1/4 THE AMOUNT ALLOWED BY EPA FOR POTABLE WATER SUPPLIES.**

All of Johnson Manufacturing solders are for Industrial and commercial applications.  
We do not sell electronic grade solder

Physical properties of [Johnson Standard Alloys](#), melting temperature, shear strength.

**Johnson Manufacturing Company • Princeton, Iowa 52768 © 2002 - 2018**



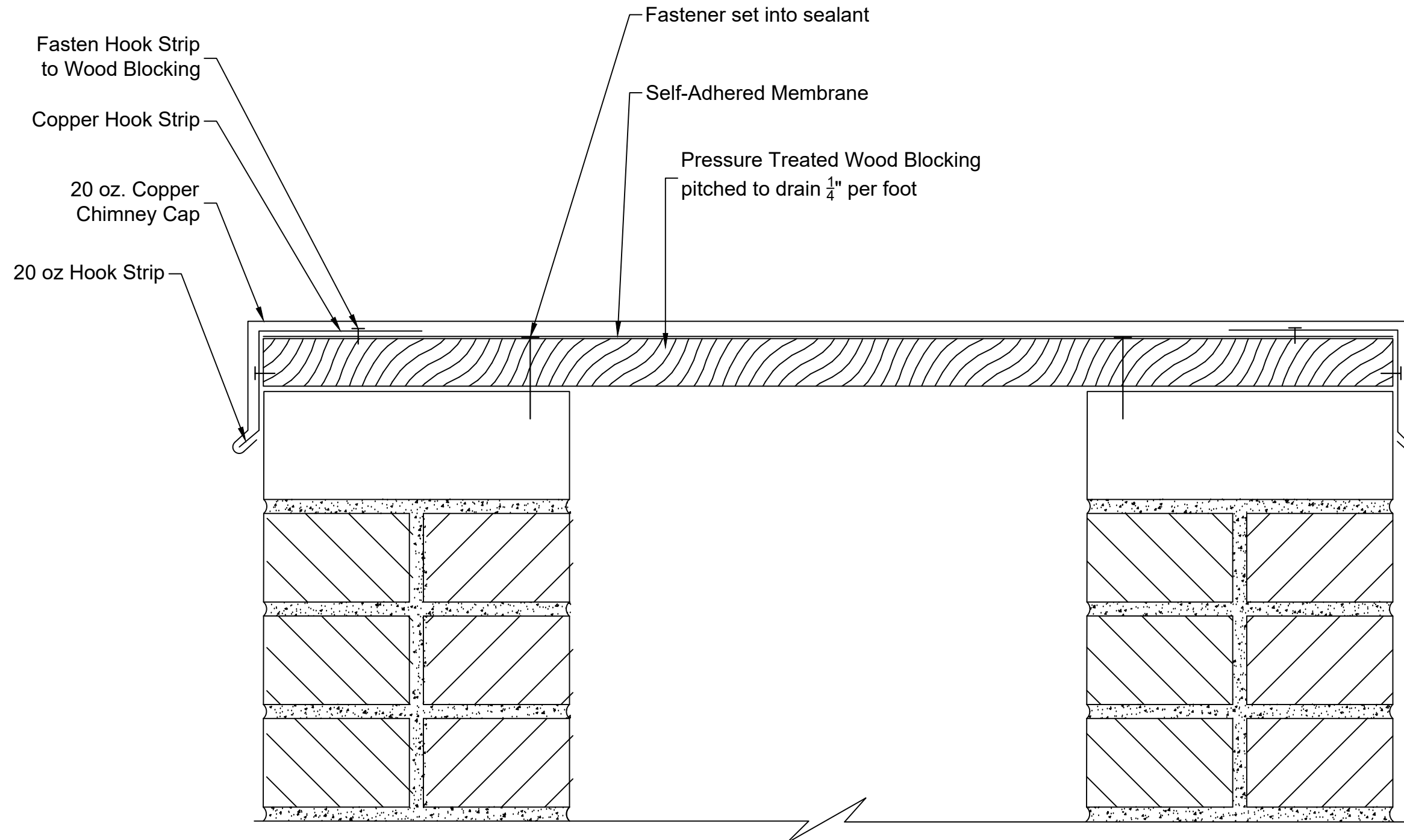
**Belmont  
Town Hall**

**Chimney Caps**

455 Concord Ave  
Belmont, MA 02487

Construction Manager:

Calhess  
374 University Avenue  
Westwood, MA 02090



**Section at Chimney Cap 1 & 2**

Revisions	Date
#1	

**Section Detail**

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DRAWN: YL	DATE: 03-17-2021
PM: LL	SCALE: NTS
DRAWING:	

**Belmont  
Town Hall**

**Chimney Caps**

455 Concord Ave  
Belmont, MA 02487

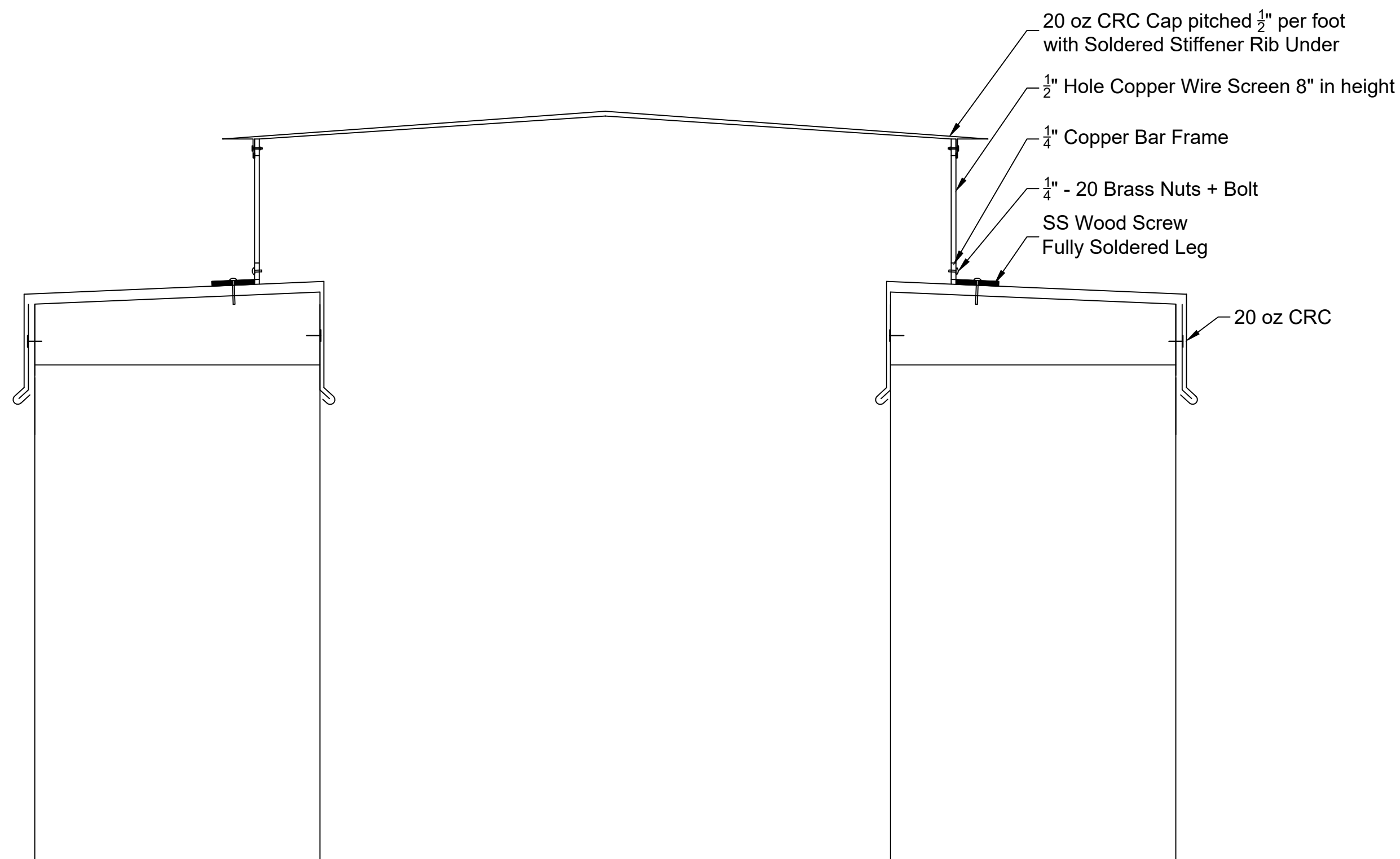
Construction Manager:

Calhess  
374 University Avenue  
Westwood, MA 02090

Revisions	Date
#1	

**Section Detail**

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PM: LL	SCALE: NTS
DRAWING:	
FILE NAME:	



**Section at Chimney Cap 3**