



TECHNICAL INFORMATION SHEET

BLOCKADE® BRAZING FILLER METAL

CHEMICAL COMPOSITION%:

Silicon	0.01 – 0.40
Phosphorus	6.0 – 7.0
Tin	6.0 – 7.0
Copper	Remainder
Other (total)	0.15

PHYSICAL PROPERTIES:

Solidus 1178F (637°C)
Liquidus 1247°F (674°C)
Brazing Range 1200°F- 1280°F (649°C - 693°C)
Density 0.293 lbs./cu.in.

BRAZING PROPERTIES:

Blockade is a unique Harris braze alloy designed for low temperature joining of copper and brass. It has a narrow melting range, but its flow characteristics allow operators to “cap”, or build up, around the finished joint.

Blockade is an excellent choice for brass brazing. Its low melting point reduces the likelihood of overheating the brass. It is often selected to replace high silver brazing filler metals for these applications. Blockade does not contain silver so significant cost reductions are available.

Blockade is not recommended for brazing steel or other ferrous alloys. The phosphorus content will form a low ductility intermetallic with the base metal. Phosphorus containing brazing alloys should not be used if the braze is exposed to sulfur compounds or sulfurous atmospheres in service.

AVAILABLE FORMS

Standard wire diameters in coils and rod & preform rings.

RECOMMENDED FLUX:

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

SPECIFICATION COMPLIANCE:

AWS A5.8 BCuP-9, ASME Section IIC SFA 5.8 BCuP-9
ISO 17672 CuP 385

BLOCKADE TEST DATA:

Pressure-Temperature Test

Conducted to requirements of ANSI/UL 1995, CAN/CSA C22.2 No. 236, Clause 61A for pressure containing vessels holding refrigerant. Evaluates brazed joint stability under elevated temperature and cyclical pressure.

Format – Copper elbows were brazed to copper tube sections with Blockade® and Stay Silv 6. The brazed sections were held at 300°F and cyclically pressurized to 600 PSI for 250,000 cycles. At the test end the pressure was elevated to 2500 PSI and the assembly held at this pressure for one minute.

Results – There was no failure in any of the brazed joints.



Brazed Copper Tube Fatigue Test

To evaluate brazed joint resistance to failure under continuous alternating loads. Test copper tube assemblies were brazed with several filler metals.

Format – Brazed copper tube/fitting test pieces. Samples brazed with Blockade, 0, 6%, and 15%. Parts held in fixture and subject to cyclically applied load.

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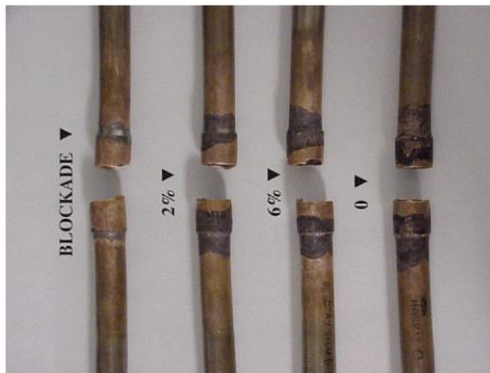
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Results – All samples failed in the copper. See data table.

Fatigue Data

Specimen	Load Ratio	Applied Load				Load Range		Date Tested	Cycles	Comments
		Maximum	Minimum	Amplitude	Mean	(lb)	(N)			
		(lb)	(lb)	(lb)	(lb)					
B-Cup 2 - 0%	0.1	1500.0	150.0	675.0	825.0	1350	6005	11/20/03	216092	Failed in Coupling
B-Cup 3 - 2%	0.1	1500.0	150.0	675.0	825.0	1350	6005	11/22/02	228187	Failed in Coupling
B-Cup 4 - 6%	0.1	1500.0	150.0	675.0	825.0	1350	6005	11/27/02	211865	Failed in Coupling
Blockade-1	0.1	1500.0	150.0	675.0	825.0	1350	6005	11/25/02	205691	Failed in Coupling

Fatigue Test Specimens



Fatigue Test Fixture



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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