



# Braze Test Specification

## 4SEXT

Braze Procedure Specification followed: 13-BPS148

### Manual Torch Brazing Process

#### Base Metal

Limited to P-107 Materials  
Fitting/Tube Size: 4", Type L, (4.125" O.D. Tube)  
Tube Material: SB-75 Seamless Tube (0.110" wall)  
Fitting Material: B16.22 Stop Coupling (0.096" wall)  
(Cup Stop Depth Modified)

#### Brazing Filler Metal

SFA-5.8 BCuP 2 through 7 permitted  
F Number: 103  
Product Form: Round, Square or Rectangular  
Rod

#### Joint Design

Joint Type: Socket (Tube/Fitting)  
Joint Clearance: 0.001" to 0.010"  
Minimum Overlap Length: 0.830"

#### Brazing Flux, Fuel Gas, or Atmosphere

Brazing flux is not permitted  
Acetylene, Natural, Propane or MAPP® Gas is permitted  
Internal Purge using Oil Free Dry Nitrogen at 5 to 20 CFH

#### Post Braze Heat Treatment

Post braze heat treatment is not permitted

#### Flow Position

All Positions  
Face fed filler metal

#### Brazing Preparation, Assembly, Technique and Sectioning

- Tube shall be cut with a clean sharp tubing cutter at not less than 6" in length. Couplings may be either roll stop or dimple stop compliant with ASME B16.22 Standard. Cup depth to be modified following NFPA99 guidelines.
- Deburr the interior edge of the cut tube end with a clean tool. Do not beat tube into fitting. Tubes should fit into coupling without force.
- Visually inspect the interior of each tube for obstructions and debris before assembly. Protect the joint before brazing from contamination.
- Method of pre-cleaning: Non-shedding abrasive pads or clean Stainless Steel wire brush to remove all oxides in the brazing area followed by wiping with a clean lint-free white cloth. Do not groove the surfaces while cleaning.
- Brazing shall take place within 8 hours after cleaning and assembly of the test coupons.
- Index horizontal position assembly by notching a defined "V" to indicate "Top of Tube" with a clean tool. Index should be positioned at twelve o'clock before brazing horizontal position.
- Purge all tubing with oil free dry nitrogen at 5 to 20 CFH flow rate while brazing and until cool to the touch. Use an oxygen analyzer to verify the absence of oxygen prior to brazing. The oxygen content shall be less than 1% before start of brazing.
- All Vertical brazing must be performed in the VERTICAL UPFLOW position.
- Use a neutral to slightly reducing flame if using oxy/acetylene
- Torch Tip Size: (Optional) #6 through #12 Rosebud permitted.
- Post Brazing Cleaning: All completed joints shall be washed with a water soaked rag or sponge, followed by brushing with a stainless steel hand wire brush to remove any residue for inspection.
- Inside of the tube shall exhibit no oxidation or flaking
- The completed braze test assembly shall be visually examined for cleanliness and the presence of brazing filler metal all around the joint at the interface between the socket and the tube. Internal and external surfaces shall be free of excessive braze metal or erosion of base metal.
- Completed assembly should be sectioned into straps or quarters as follows; Horizontal Joints must be cut at 45 degrees off top brazed position. Vertical Joints may be cut from any degree location. Sectioning shall result in two sets of 1/2" wide straps or two quarters of assembly cut 180 degrees apart. Straps or quarters may be polished with 80 to 120 Grit Flap Disc along brazement without excessive removal of base metal.
- The sectioned components of entire assembly must be identified with Brazer's First Initial, Last Name and Last 4 digits of Social Security Number. Each Joint shall be identified with braze position. "H" for Horizontal and "V" for Vertical and submitted to NITC Southern Regional Office, 2540 Severn Ave., Suite 200, Metairie, LA 70002 along with completed documentation.
- **NO BENDING, FLATTENING, DISTORTION or GRINDING allowed on sectioned assemblies.**



# Brazer Qualification Record

In Compliance with NFPA 99 and ASME Code Section IX

## 4SEXT

Name of Brazer: \_\_\_\_\_ Brazer Identification Number: \_\_\_\_\_

Braze Test Date: \_\_\_\_\_ Braze Procedure Specification followed: 13-BPS148

Brazeing Qualification Limits		
Brazeing Variables	Actual Values	Ranges Qualified
Brazeing Process	Manual Torch	Manual Torch
Method of Cleaning	3M Pad, Cloth Wipe, SS Wire Brush	3M Pad, Cloth Wipe, SS Wire Brush
Base Metals P-Number	P-107	P-107
First Base Metal Thickness	0.110"	0.055" to 0.220"
Second Base Metal Thickness	0.096"	0.048" to 0.192"
Joint Type	Socket	Socket & Lap
Joint Clearance	0.001" to 0.010"	0.001" to 0.010"
Joint Overlap Length	0.830"	1.038" maximum
Internal Purge Gas	Oil Free Dry Nitrogen @ 5 to 20 CFH	Oil Free Dry Nitrogen @ 5 to 20 CFH
First Brazeing Flow Position	Horizontal	All Flow Positions
Second Brazeing Flow Position	Vertical Up	
Filler Metal Product Form	Face Fed Rod	Face Fed Rod
Filler Metal Specification	BCuP 5	All BCuP Series Rod
Filler Metal F-Number	F-103	F-103

Examination Results
Visual Examination of Completed Braze Assembly (QB-141.6): Acceptable (no signs of flaking or internal oxidation)
Test Lab Sectioning Test Results (QB-181): Acceptable

We certify that the statements in this record are correct and that the test coupons were prepared, brazed, and tested in accordance with requirements of NFPA 99 and Section IX of the ASME Code.

_____ NITC Representative/Authorized Testing Representative Name	_____ NITC Representative/Authorized Testing Representative Signature	_____ Date:
_____ Manufacturer/Contractor Company Name	_____ Manufacturer/Contractor Representative Signature	_____ Date:
_____ National ITC Corporation Certified Test Lab Company Name	_____ Certified Test Lab Representative Signature	_____ Date:

The undersigned contractor hereby adopts this Brazer Qualification Record and accepts the responsibility for construction of brazements performed by the Brazer in accordance with the Contractor's Brazeing Procedure Specifications.

_____ Manufacturer/Contractor Company Name	_____ Manufacturer/Contractor Representative Signature	_____ Date:
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