



Braze Test Specification

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Braze Procedure Specification followed: 13-BPS148

Manual Torch Brazing Process

Base Metal

Limited to P-107 Materials
Fitting/Tube Size: 6", Type L, (6.125" O.D. Tube)
Tube Material: SB-75 Seamless Tube (0.140" wall)
Fitting Material: B16.22 Stop Coupling (0.124" wall)

Brazing Filler Metal

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

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.
- 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 mark 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.**

Joint Design

Joint Type: Socket (Tube/Fitting)
Joint Clearance: 0.001" to 0.010"
Overlap Length: 3.09"

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



Brazer Qualification Record

In Compliance with NFPA 99 and ASME Code Section IX

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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 | 0.140" | 0.0625" to 0.280" |
| Second Base Metal Thickness | 0.124" | 0.062" to 0.248" |
| Joint Type | Socket | Socket & Lap |
| Joint Clearance | 0.001" to 0.010" | 0.001" to 0.010" |
| Joint Overlap Length | 3.09" | 3.86" 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.

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| _____ 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.

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