Braze Test Specification

R218

Braze Procedure Specification followed: 18-R78 Revision 1

Manual Torch Brazing Process

Base Metal

Limited to P-300 Materials
Fitting/Tube Size:
2 ⅛" O.D., Type ACR or 2", Type L (2.125" O.D.)
Tube Material: ASTM B280 Seamless Tube (0.070" wall)
Fitting Material: ASME B16.22 Stop Coupling (0.059" 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

Joint Design

Joint Type: Socket (Tube/Fitting)
Joint Clearance: 0.001" to 0.010"
Overlap Length: 1.34" minimum

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 10 CFH

Post Braze Heat Treatment

Post braze heat treatment is not permitted

Brazing Preparation, Assembly, Technique and Sectioning

- Tube shall be cut with a clean sharp tubing cutter at not less than 3" in length. 4" minimum length is required if using double assembly. Assembly may be either single or double coupling. 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 from contamination.
- Method of pre-cleaning: Non-shedding abrasive pads and/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.
- Index horizontal position assembly by notching a defined "V" to indicate "Top of Tube" with a clean tool. Index mark should be placed in the brazing jig at Brazer's left-twelve o'clock position prior to brazing horizontal position.
- All Vertical brazing must be performed in the VERTICAL UPFLOW position.
- Brazing shall take place within 8 hours after cleaning and assembly of the test coupons.
- Purge all tubing with oil free dry nitrogen at 5 to 10 CFH flow rate while brazing and until cool to the touch.
- Use a neutral to slightly reducing flame if using oxy/acetylene.
- Torch Tip Size: (Optional) 49 through 30; use of Turbo Torch® or Rosebud permitted.
- Post Brazing Cleaning: All completed joints shall be washed with a water-soaked cloth, 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 or two halves or by removing one ½" wide strap. Horizontal Joints must be sectioned at 45 degrees from off top (index mark) brazed position. Vertical Joints may be cut from any degree location. Strap or halve should be lightly polished with a 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.
- **<u>NO</u> BENDING, FLATTENING, DISTORTION or GRINDING allowed on sectioned assemblies.**

Southern Regional Office: 2540 Severn Avenue, Suite 200 • Metairie, LA 70002
(888) 234-6834 • (504) 885-2941 • Fax (504) 455-5233

Brazer Qualification Record

In Compliance with ASME Boiler & Pressure Vessel Code Section IX and ASME B31.5 Refrigeration Piping and Heat Transfer Components Standard

R218

Name of Brazer: _____ Brazer Identification Number: _____

Braze Test Date: _____ Braze Procedure Specification followed: **18-R78 Rev. 1**

Brazing Qualification Limits

Brazing Variables	Actual Values	Ranges Qualified
Brazing 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-300	P-300
First Base Metal Thickness	0.070"	0.035" to 0.140"
Second Base Metal Thickness	0.059"	0.030" to 0.118"
Joint Type	Socket	Socket & Lap
Joint Clearance	0.001" to 0.010"	0.001" to 0.010"
Joint Overlap Length	1.34"	1.67" maximum
Internal Purge Gas	Oil Free Dry Nitrogen @ 5 to 10 CFH	Oil Free Dry Nitrogen @ 5 to 10 CFH
First Brazing Flow Position	Horizontal	All Flow Positions
Second Brazing Flow Position	Vertical Up	
Filler Metal Product Form	Face Fed Rod	Face Fed Rod
Filler Metal Specification	BCuP 3	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 Section IX of the ASME Code.

Authorized Testing Representative Name	Authorized Testing Representative Signature	Date
Manufacturer or Contractor Company Name/Representative 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 Brazing Procedure Specifications.

Manufacturer or Contractor Company Name/Representative Name	Manufacturer/Contractor Representative Signature	Date

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