Society of Automotive Engineers, Inc.
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AEROSPACE MATERIAL SPECIFICATION

AMS 2675C
Superseding AMS 2675B
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NICKEL ALLOY BRAZING

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for joining corrosion and heat resistant steels and alloys but may also be used for joining carbon and low alloy steels. Recommended for use on assemblies which will operate at combinations of stress and temperature too high for copper brazed joints or where corrosion and oxidation resistant joints are required.

3. PROCESS REQUIREMENTS:

3.1 Surface Condition: The surfaces to be joined shall be clean prior to assembly. Surface roughness of approximately 125 microinches is desirable, particularly when brazing alloy is applied by spraying, but is not required. If surfaces are prepared by blasting, use of abrasive with particle size approximately the same as SAE 50 or SAE 120 cast iron grit is recommended and residual abrasive shall be removed from surfaces to be joined before they are assembled. Blasting with materials which tend to prevent wetting, such as sand, zirconite, and alumina shall not be used on those surfaces to be brazed.

3.2 Fluxing: Flux shall not be used unless permission be obtained from purchaser before brazing.

3.3 Assembly: The parts to be joined shall be assembled so that the clearance between mating surfaces is within the tolerances specified on the drawing. (Note. Clearance of approximately 0.002 in. on a side is recommended.) The assembly should be supported so that the parts will be in proper alignment after brazing.

3.4 Ø Brazing Filler Metal: Unless otherwise specified, nickel alloy filler metal shall conform to AMS 4775.

3.5 Ø Joining: Unless otherwise specified, heating and joining may be effected by any of the following methods: furnace (retort or continuous), electrical induction, and electrical resistance. All brazing operations shall be performed in an environment which protects the surface of the material being brazed from contamination which will prevent wetting and flowing. The atmosphere requirements of 3.5.1 must be maintained. The brazing temperature shall be from 25 F (14 C) above the actual liquidus to 200 F (93.3 C) above the maximum liquidus for the filler metal used. Parts shall be heated until the filler metal melts and the joint is formed. After the filler metal melts, heating may be prolonged to aid diffusion but erosion of the joint shall be avoided.

3.5.1 Ø Except as specified in 3.5.1.1, 3.5.1.2, and 3.5.1.3, the protective atmosphere for brazing shall be hydrogen of not less than 99.94% purity and dew point not higher than -25 F (-32 C) as determined on gas being exhausted from the furnace or retort work zone.

3.5.1.1 If all scale and all visible oxides are removed from all surfaces of parts before the parts are placed in the brazing furnace, one of the following atmospheres may be used:

	Dew Point, max (See Note 2)	Purity %, min
Argon	-35 F (-37 C)	99.99
Argon + Hydrogen (See Note 1)	-35 F (-37 C)	(See Note 3)
Vacuum		5 - 20 microns Hg (See Note 4)

Note 1. Mixture may be in any proportions.

Note 2. Dew point shall be determined on gas being exhausted from the furnace or retort work zone.

Note 3. Purity of argon in the mixture shall be as specified above; purity of hydrogen shall be as specified in 3.5.1.

Note 4. When permitted by purchaser, higher vacuum (lower pressure) than 5 microns Hg may be used.

3.5.1.2 Atmospheres other than those listed in 3.5.1 and 3.5.1.1 may be used when authorized in writing by purchaser; such authorization will be granted only after demonstration, to the satisfaction of the purchaser, that use of such atmospheres will not cause scaling, carburization, nitriding, or excessive decarburization of the basis metals and will produce joints which consistently meet all requirements of this specification.

3.6 Cooling: After brazing, assemblies shall be cooled in such a manner as to prevent cracks and minimize internal stress, distortion, and decarburization. Cooling from the brazing temperature to below the scaling temperature shall be done in a suitable protective atmosphere. Scaling shall be absent but slight tinting will be permitted. If hardening is to be executed in conjunction with brazing, cooling procedures may be revised accordingly.

3.7 Flux Removal: After brazing and cooling, flux, if used, shall be removed from the parts by a method not injurious to the specified surface finish.

3.8 Heat Treatment: If hardness is specified for the brazed assembly and heat treatment is required, such heat treatment shall follow the brazing operation, except as specified in 3.6.

4. QUALITY:

4.1 Exterior examination of joints shall show a complete line or ring of filler metal between component parts at the end of the joint at which the filler metal was introduced and, when practical, shall show at least a metallic stain of filler metal at the opposite end of the joint, to indicate penetration of filler metal in the joint.

4.2 Unless otherwise specified, the area joined by filler metal shall be not less than 80% of the area of the mating portions of the assembly. The method of determining that the above requirement is met shall be as agreed upon by purchaser and vendor. When a proof test is specified on the drawing, any part from a lot, selected at random, shall pass that test.

4.3 Surfaces of parts shall be free of excessive filler metal.

4.4 Brazed joints shall be sound, clean, and free from imperfections detrimental to performance of assemblies.