



AEROSPACE MATERIAL SPECIFICATION

AMS2821™**REV. A**

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Superseding AMS2821

Salts, Heat-Treating (for Metals)

RATIONALE

AMS2821A is the result of a Five-Year Review and update of this specification with changes to Application (see 1.2), Authority (see 1.5), Composition (see 3.1, Table 2, 3.1.1, and Table 3), physical requirements of salts (see Table 4), Appearance (see 3.3.1), Reports (see 4.4.1.1), and Notes (see 8.7).

1. SCOPE

1.1 Form

This specification covers the procurement of granular heat-treating salts suitable for use in the molten state.

1.2 Application

This product has been typically used as quenching media for the heat treatment of metals and alloys to minimize distortion and reduce residual stress, but usage is not limited to such applications (see 8.2).

1.3 Safety - Hazardous Materials

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards that may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved (see 8.4).

1.4 Classification

The salts shall be of the classes shown in Table 1 as specified in the purchase order (see 3.5 and 8.3).

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Table 1 - Classification of salts

Class	Working Range °F (°C)
1	325-1100 (163- 593)
2	550-1100 (288- 593)
3	1150-1700 (621- 927)
4	1100-1650 (593- 899)
4A	1025-1400 (552- 760)
5	1300-1650 (704- 899)
6	1650-2000 (899-1093)
7	1900-2400 (1038-1316)
8	1650-2350 (899-1288)

1.5 Authority

The cognizant engineering organization (CEO) may impose requirements or approve allowances that supersede the requirements in this AMS.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AS7766 Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D1193 Reagent Water

ASTM D4327 Anions in Water Ion by Suppressed Ion Chromatography

ASTM E70 pH of Aqueous Solutions With the Glass Electrode

2.3 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-S-10699 Salt, Heat Treating (For Metals)

2.4 ASQ Publications

Available from American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203, Tel: 800-248-1946 (United States or Canada), 001-800-514-1564 (Mexico), or +1-414-272-8575 (all other locations), www.asq.org.

ANSI/ASQ Z1.4 Sampling Procedures and Tables for Inspection by Attributes

2.5 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 2. Melting temperature, as determined by 3.2.1, is adequate to determine the composition.

Table 2 - Composition, percent by weight

Class	Sodium Nitrite (NaNO ₂)	Sodium Nitrate (NaNO ₃)	Potassium Nitrate (KNO ₃)	Sodium Carbonate (Na ₂ CO ₃)	Sodium Chloride (NaCl)	Potassium Chloride (KCl)	Barium Chloride (BaCl ₂)	Calcium Chloride (CaCl ₂)	Silica
1	37-50	0-10	50-60						
2		43-57	43-57						
3				45-55		45-55			
4					15-25	20-32	50-60		
4A					10-15	25-30	40-45	15-20	
5					40-60	40-60			
6						5-15	85-95		
7A							100		
7B							98.75 min		0.25-1.25
7C							97.5 min		1.5-2.5
7D							96 min		4.0-5.0
8					3-7		93-97		

3.1.1 Salts shall be analyzed for impurities shown in Table 3 in accordance with wet chemical test methods or ion chromatography methods (refer to ASTM D4327) as acceptable by the cognizant engineering organization. The samples shall be mixed thoroughly before conducting the tests. Water in accordance with ASTM D1193 Type III and reagent grade chemicals shall be used. Blank determinations shall be run and corrections applied where significant (see 8.7).

3.1.1.1 Neutrality (pH), all classes except Class 3. Transfer a 1-g sample, weighed to 0.5 mg, to a 150-mL beaker and dissolve in 100 mL of carbon-dioxide-free water. Determine the pH by means of pH meter in accordance with ASTM E70.