

The 101 of AMS Specifications for Aluminum Heat Treating

AMS is an acronym for *Aerospace Material Specifications* put forth by the Society of Automotive Engineers or SAE. AMS specifications are a comprehensive database composed of individual directives that standardize procedures, equipment and processes related to aerospace material processing. The specifications are compiled by SAE's aerospace materials committees. They are continuously updated and revised to keep pace with advances in material science and processes technologies. Below is an overview of AMS specifications pertaining to aluminum heat treating and associated equipment.

AMS2750E This specification covers pyrometric requirements of thermal processing equipment used for heat treatment. The "E" at the end of the number sequence denotes the revision. The standard covers:

1. Temperature Sensors
2. Instrumentation
3. Thermal processing Equipment
4. System accuracy Tests
5. Temperature Uniformity

Additionally, the specifications also define furnace classes according to their thermal precision or temperature uniformity, in addition to, the type of monitoring, control and recording instrumentation used. Below is a chart that provides an overview of furnace classification.

Instrumentation	Type					Furnace Class	Temperature Uniformity	
	A	B	C	D	E		°C	°F
One thermocouple connected to the controller for each control zone	X	X	X	X	X	1	± 3	± 5
Record of the temperature measured by the control thermocouple	X	X	X	X		2	± 6	± 10
Sensors for recording	X		X			3	± 8	± 15
One charge thermocouple with record for each control zone	X	X				4	± 10	± 20
One over-temperature protection device for each control zone	X	X	X	X		5	± 14	± 25
N/A						6	± 24	± 50

AMS 2770N This specification dictates engineering requirements and standards used in the heat treatment of wrought aluminum alloys. The standard includes the following thermal processes for aluminum:

1. Precipitation Hardening (artificial aging)
2. Annealing
3. Solution Heat Treating
4. Quenching

AMS 2771E This specification dictates engineering requirements and standards used in the heat treatment of aluminum castings and parts machined or fabricated from aluminum cast materials. The standard includes the following thermal processes for aluminum:

1. Precipitation Hardening (artificial aging)
2. Annealing
3. Solution Heat Treating
5. Quenching

AMS 2772F This specification dictates engineering requirements and standards used in the heat treatment of wrought aluminum alloy raw materials e.g. PLATE, BAR STOCK, TUBES. The standard includes the following thermal processes for aluminum:

1. Precipitation Hardening (artificial aging)
2. Annealing
3. Solution Heat Treating
4. Quenching

AMS 3025D This specification covers two types of polyalkylene glycol in the form of a liquid. This product has been used typically as a quenching medium for solution heat treatment of aluminum alloys. This type of quenching medium is typically used in combination with a subsequent water quench for removing (rinsing) any residual glycol compound from the part. Furnaces utilizing this quenching medium usually have a dual quench tank system integrated into their operation.

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