



AMS 2750 salient features

Pyrometry requirements for heat treatment furnaces

AMS 2750 is the SAE aerospace standard for **pyrometry**: how heat treatment furnaces measure, control, record, calibrate and verify temperature. It is mandatory for aerospace heat treating, including Nadcap AC7102 audits and customers such as Boeing, Airbus, GE and Rolls-Royce. The latest revision known is **G**; confirm the revision your customer requires.

FURNACE CLASSES

6 classes

INSTRUMENTATION

Types A-D

CORE TESTS

TUS and SAT

Core elements

AREA	WHAT THE STANDARD REQUIRES
Furnace classes (1-6)	Defined by the allowed temperature uniformity across the working zone. See the class table below.
Instrumentation types (A-D)	Set the number and quality of control, over-temperature, monitoring and recording sensors and instruments. Furnace class and instrumentation type together decide the test intervals.
TUS (temperature uniformity survey)	Test sensors placed throughout the qualified working volume prove the furnace holds its class. Sensor count depends on working volume, with more for larger furnaces. Required initially, periodically, and after major repair or modification.
SAT (system accuracy test)	A calibrated test sensor and test instrument are compared against the furnace's own control or recording system. The allowed difference is tight, and frequency depends on class and instrumentation type.
Thermocouple calibration	Test and control thermocouples must be calibrated. Calibration labs must be accredited, typically to ISO/IEC 17025, and traceable to NIST or equivalent.
Thermocouple use limits	Rules cover permitted types, reuse and refurbishment counts, wire lot certification, and the rule that base-metal thermocouples cannot be used indefinitely.
Instrument calibration	Controllers, recorders and over-temperature units must be calibrated at defined intervals against standards. Calibration stickers show due dates.
Records and traceability	Records are required for TUS, SAT, calibrations, out-of-tolerance events and corrective actions. They must be retained and available for audit.
Out-of-tolerance handling	Defines actions after a failed SAT, TUS or calibration: quarantine the furnace and assess product processed since the last good test.
Test intervals	Better furnace classes and instrumentation types allow longer TUS and SAT intervals, from weekly through annual. Intervals can sometimes be extended with a stable test history.
Load and process sensors	Rules for load thermocouples, product-controlled processing, and verification of alloy-specific and customer-specific requirements.

Furnace classes and temperature uniformity

Allowed uniformity across the qualified working zone. Lower numbers mean tighter control.

CLASS	TOLERANCE (± °F)	TOLERANCE (± °C)	RELATIVE TOLERANCE
Class 1	±5	±3	
Class 2	±10	±6	
Class 3	±15	±8	
Class 4	±20	±10	
Class 5	±25	±14	
Class 6	±50	±28	

What this means for furnace builders

- 01

Design for uniformity
Use enough heating zones, good airflow or circulation, and an insulation layout that achieves Class 2 or better where aerospace work is expected.
- 02

Provide survey ports
Allow test thermocouples to be inserted for TUS and SAT.
- 03

Fit the right instrumentation
A multi-point recorder and independent over-temperature protection are needed to reach the higher instrumentation types.
- 04

Offer a documentation package
Supply calibration and survey documentation, because customers and auditors will ask for it.

Related standards

STANDARD	SCOPE
AMS 2750	Pyrometry
AMS 2759	Heat treatment of steel parts; calls up AMS 2750 requirements
Nadcap AC7102	Heat treating audit checklist
CQI-9	Automotive equivalent, based on similar pyrometry rules

Note: numeric tolerances, sensor counts and intervals vary by furnace class, instrumentation type and revision. Verify them against the current AMS 2750 tables before using them in customer documents or quotations.