

AMS 2750E / CQI-9 / Furnace specifications

AMS 2750E (aerospace) and CQI-9 (automotive) - [These specifications](#) covers pyrometric requirements for thermal processing equipment used for metal heat treatment. It covers temperature sensors, instrumentation, thermal processing equipment, system accuracy tests (SAT), and temperature uniformity surveys (TUS). These are necessary to ensure that ferrous and non-ferrous materials like tool steels and aluminum are heat treated in accordance with the applicable specification(s) and standards.

For more detailed information on [AMS2750E we refer you to the Industrial Heating article](#).

CQI-9 is commonly used in the automotive industry. The instrumentation requirements are a little less stringent than AMS 2750E.

NADCAP AS7102 (Requirement for Heat Treating) auditors certify that manufacturers are following all process requirements including furnace pyrometry AMS 2750E or CQI-9 for heat treatment of materials. Common furnaces and ovens used in these industries:

- [Bottom drop](#) and [continuous furnaces](#) for aircraft parts
- [Box furnaces](#)
- [Tool room and laboratory furnaces](#)

For the heat treater, the most important information is found in the heat-treating specifications (examples: AMS 2759E, MS 2759/11, AMS 2770J, AMS 2771E, AMS 2772F) of the materials. This dictates what furnace / oven temperature uniformity (furnace class) and instrumentation type he needs to use.

Instrumentation Type	Process Control TC	Recorded Process Control TC	Hot Spot Location TC	Cold Spot Location TC	Load TC	Over Temperature TC
A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
D	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
E	<input checked="" type="checkbox"/>					

Furnace Class	Temperature Uniformity Range (°F)	Temperature Uniformity Range (°C)
1	±5	±3
2	±10	±6
3	±15	±8
4	±20	±10
5	±25	±14
6	±50	±28

Many Industries have developed their own pyrometry specifications for furnaces and ovens; but most of them refer to AMS 2750E.

Codes, process and pyrometric heat treat equipment specifications:

AMS 2750E Covers pyrometric requirements for thermal processing equipment used for heat treatment. It covers temperature sensors, instrumentation, thermal processing equipment, system accuracy tests and temperature uniformity surveys.

BAC 5621 Establishes equipment classifications and instrumentation types for processes requiring controlled temperatures. (similar to AMS 2750E) Boeing process specification title: "temperature control for processing materials".

RPS953 Rolls Royce specifications for "laboratory control procedure for heating furnaces and Associated equipment and the thermal processing of materials". Equipment shall meet AMS 2750E Class 2 for temperatures <1380degF.

NADCAP AS7102 This aerospace standard (AS) establishes the requirements for heat treating accreditation by the National Aerospace and Defense Contractors Accreditation Program (NADCAP).

A United States **defense standard**, often called a **military standard**, "**MIL-STD**", "**MIL-SPEC**", or (informally) "**MilSpecs**", is used to help achieve standardization objectives by the U.S. Department of Defense.