



# API 6A (ISO 10423) heat treatment requirements

Wellhead and Christmas tree equipment — what it means for heat treatment furnaces

**Scope.** API 6A has no standalone furnace-design standard. Its heat-treatment requirements sit within the manufacturing and quality control sections. The figures below summarise general compliance expectations; always verify limits against the current edition of the standard.

**±14 °C**

**FURNACE UNIFORMITY**  
(±25 °F) across the working zone

**PSL 1–4**

**TEST COUPON VERIFICATION**  
Product specification levels

**Q1 · ISO 9001**

**QUALITY FRAMEWORKS**  
Operate alongside API 6A

## 01 Furnace uniformity

- Production furnaces must be surveyed to prove temperature uniformity within ±14 °C (±25 °F) across the working zone.
- Surveys use calibrated thermocouples placed at defined positions in the load zone.
- Repeated at set intervals and after major repairs or modifications.

## 02 Calibration and instruments

- Controllers, recorders and thermocouples are calibrated at scheduled intervals.
- Calibration is fully traceable to national or international standards.
- Complete calibration records are retained for QA auditing.

## 03 Control and recording

- Automatic control is mandatory, with a continuous time–temperature record for every load.
- Cycles (austenitizing, tempering) must hold the specified soak temperature and duration accurately.

## 04 Quenching system

- Quench medium (water, polymer, oil) and tank temperature are tightly regulated.
- Furnace-to-quench transfer delay is strictly controlled.
- Records must verify that the specified cooling rates were achieved.

Requirements are summarised from API 6A (ISO 10423). Continued on page 2.



# From load to lot: records, coupons and procedures

## 05 Traceability and records

- Each load is tied directly to heat number, part and lot.
- Logs show furnace ID, exact cycle parameters and operator.

## 06 Test coupons

- Qualification coupons undergo identical heat-treat cycles as production parts.
- Testing covers tensile, yield, elongation, hardness and Charpy impact.

## 07 Procedures and quality systems

Written heat-treatment procedures are required for each material and part type, specifying load arrangements, hold times and cooling methods. Systems operate alongside API Q1 and ISO 9001 quality frameworks.

## API 6A quick reference summary

| PROCESS AREA | KEY EXPECTATION                                                |
|--------------|----------------------------------------------------------------|
| Uniformity   | ±14 °C, repeated periodically via furnace survey               |
| Calibration  | Fully traceable, scheduled and recorded instruments            |
| Control      | Automatic control with a continuous chart for every load cycle |
| Quench       | Controlled medium, bath temperature and transfer delay         |
| Verification | Test coupons verified to PSL requirements (PSL 1 to 4)         |

### PRACTICAL NOTE FOR FURNACE MANUFACTURERS

Oil and gas buyers frequently require pyrometry compliance standards such as **AMS 2750** or **CQI-9** alongside API 6A. Essential furnace features include multi-zone control, multi-point recording and dedicated survey ports.

*Figures are for general guidance. Verify all limits against the current editions of API 6A / ISO 10423, API Q1, AMS 2750 and CQI-9.*