

Ovens & Furnaces for AMS 2750

Since 2011, TMS Europe have offered a range of ovens and furnaces specifically developed for AMS 2750, to be Nadcap compliant, and ease the burden of its ongoing requirements.

We are specialists in calibration, and an independent manufacturer of thermocouples, ovens and furnaces. We are uniquely positioned to provide our Aerospace and Automotive sector heat-treatment customers with products that are certified to meet their requirements, before they even leave our factory. With our team of highly skilled on-site calibration engineers, we can offer ongoing support with calibration and thermal surveys.

Wholly designed to aid the user in efficiently managing the ongoing tasks required under AMS 2750F, these ovens and furnaces come complete with; SAT ports (for System Accuracy Tests), TUS port (for Temperature Uniformity Surveys), and accessible thermocouple connections (for instrumentation calibration). All included as standard.

As well as offering AMS 2750F and Nadcap compliance, these models can also be Rolls Royce RPS 953 compliant, either as standard or with optional customisations (depending on the model). If this is a part of your requirements, please ask about these options when enquiring.

We manufacture all our thermocouple sensors in our units from material calibrated in accordance with AMS 2750F, with a copy of the calibration certificate being supplied with each unit. Before shipping, our calibration engineers perform instrument calibrations on all channels of the instruments, under our ISO 17025 (UKAS) accreditation. A multi-point thermal survey is also performed, with its results compiled into a fully detailed survey report. This means every unit leaves our factory having been certified as meeting the requirements of AMS 2750F, and ready for the ongoing rigors of Nadcap compliance.

In addition to our range of standard models, we offer ovens and furnaces with higher maximum temperatures and larger capacities, as bespoke products on longer lead-times. Please contact us with your preferred Furnace Class, Instrumentation Type, Work Zone size and Working Temperatures, for more information and a quote.



TMS Europe Ltd is a UKAS accredited calibration laboratory No. 0461. We are ISO 17025 accredited for calibration on site and in our laboratory, as defined in our Schedule Of Accreditation (see www.tmseurope.co.uk/soa).

Specification and price subject to change without notice. Appear may vary from image(s) shown. All trade marks acknowledged.

Standard Models

We currently offer standard models in the 3 ranges:

- **Ovens – 300°C max : 4 sizes**
- **Furnaces – 1100°C max. : 4 sizes**
- **Furnaces – 1200°C max. : 1 size**

Model Variants - Instrumentation Type

Each model is available in 3 variants to suit the AMS 2750F Instrumentation Type required. Generally our Type D variant is the most popular, and it also offers the flexibility of upgrading to a higher Type (A, B or C), at a later date, simply by adding suitable thermocouples (available from TMS).

Under AMS 2750F (Section 3.3.2) Instrumentation Type defines the required controllers/recorders, the number of sensors (thermocouples) and their purpose. This choice has ramifications for other practices under the standard, including the intervals between SAT's (thermocouple checks, Section 3.4: Table 14/15) and TUS's (thermal surveys, Section 3.5: Table 18/19).

Model Variants of TMS Ovens and Furnaces for AMS 2750				
Features	Type E variants	Type E+ variants	Type D variants	Type D variants, with optional additional thermocouples
For AMS 2750F Instrumentation Type	E	E (or D*)	D	A, B, or C
Standard Controller:	Eurotherm 3216	Eurotherm EPC3016	Eurotherm nanodac	Eurotherm nanodac
Recording <small>(channels: used/total)</small>	-	-	✓ 2/4	✓ 3-4/4
Over-temperature Protection	✓	✓	✓	✓
Ethernet communications	-	✓	✓	✓
Standard Timed Programs	-	✓ 1	✓ 100	✓ 100
Standard Accessible Thermocouple Connections	✓ 2	✓ 2	✓ 4	✓ 4
2 additional recording sensors at hottest and coldest points	-	-	-	✓
Load recording sensor	-	-	-	✓

* Utilising the Ethernet comms in conjunction with a suitable external recorder increases this to Type D.

Model Variants - Furnace Class

We offer each variant with up to 5 choices of temperature uniformity Class, depending on what our testing and prior experience shows each model is realistically capable of achieving. As such, we have specified our maximum Work Zone sizes, for which all our standard models will meet Class 4 ($\pm 10^{\circ}\text{C}$), typically across the full temperature range. Most models can achieve Class 2 ($\pm 6^{\circ}\text{C}$), with some requiring a reduced Work Zone area. Class 1 may be achievable within small areas and range. Our units to Class 4 are also suitable for working to Class 5 or 6.

Under AMS 2750F (Section 3.3.1) Furnace Class defines the required temperature uniformity within the Work Zone of the chamber, e.g. Class 4 is $\pm 10^{\circ}\text{C}$. Keep in mind that under AMS 2750F these thermal uniformity tolerances must include any thermal overshoot as the unit first approaches the setpoint, rather than merely under stabilised steady-state conditions. This is an important distinction from some other standards, and many stated thermal uniformity figures for general-purpose ovens and furnaces. The Work Zone is the defined area/volume within the chamber that is established by TUS (survey) as being within the required tolerance. As such, no parts (or material) can be placed outside the Work Zone. This choice has ramifications for other practices under the standard, including the intervals between SAT's (thermocouple checks, Section 3.4: Table 14/15) and TUS's (thermal surveys, Section 3.5: Table 18/19).

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Ovens – 300°C max.

Precision air-circulating ovens for laboratory or light industrial / production use, over a temperature range of 50 to 300°C. With horizontal forced air convection throughout the stainless steel lined chamber.

The fan speed control is preset and the outlet vent control knob is marked for optimum uniformity when working to AMS 2750F.

These models may use a Resident SAT thermocouple (optional extra) under AMS 2750F (Section 3.4.7.4).

A door switch option can be added, and is recommended if working to tighter tolerances and the door will be opened (e.g. for loading/unloading or checks) during tests or processing.

An audible over-temperature protection alarm buzzer is fitted as standard. By default, the over-temperature protection must be reset by the user if tripped. By default, the over-temperature protection thermocouple is recorded (on variants 'D' or higher).

Typical lead-time for these models is 2-4 weeks, expect for the TMS SNOL 2750-420/300 variants which are 5-8 weeks.



Model	Total Volume	Maximum Work Zone (WxDxH)	Total Chamber Size External Size (WxDxH)	Power / Voltage / Plug	Weight
TMS SNOL 2750-60/300	60 L	300 x 250 x 340mm 26 L	380 x 380 x 420mm 630 x 740 x 760mm	2 kW / 230V / UK 13A	50 Kg
TMS SNOL 2750-120/300	120 L	460 x 260 x 420mm 50 L	550 x 400 x 580mm 810 x 780 x 920mm	2 kW / 230V / UK 13A	70 Kg
TMS SNOL 2750-220/300	220 L	630 x 400 x 500mm 126 L	730 x 500 x 620mm 975 x 920 x 955mm	4 kW / 230V / Blue 32A	102 Kg
TMS SNOL 2750-420/300	420 L	800 x 400 x 680mm 218 L	1000 x 500 x 860mm 1300 x 1030 x 1300mm	6.2kW / 400V / Red 16A	178kg

Power Connector: UK 13A = BS1363. Blue = IEC60309. Red = IEC60309, 5-pin 3P+N+E (Star+N)
Shelves: 3 standard, extra available (positions subject Work Zone constraints)

Model Variant	Class 4 (±10°C)	Class 3 (±8°C)	Class 2 (±6°C)	Class 2 & RPS (±5°C)	Class 1 (±3°C)
TMS SNOL 2750-60/300 D	✓	✓	✓	Area TBC	?
TMS SNOL 2750-120/300 D	✓	✓	✓	Area TBC	?
TMS SNOL 2750-220/300 D	✓	✓	Area TBC	Area TBC	?
TMS SNOL 2750-420/300 D	✓	✓	Area TBC	Area TBC	?
TMS SNOL 2750-60/300 E	✓	✓	Area TBC	-	-
TMS SNOL 2750-120/300 E	✓	✓	Area TBC	-	-
TMS SNOL 2750-220/300 E	✓	✓	Area TBC	-	-
TMS SNOL 2750-420/300 E	✓	✓	Area TBC	-	-

Key	
✓	Achievable with our maximum Work Zone, typically over the full temperature range.
Area TBC	Achievable subject to a slightly reduced Work Zone, depending on the temperature range. The Work Zone will be confirmed during testing before the final survey.
?	May be achievable subject to a much reduced Work Zone, depending on the temperature range and the load. Testing will be required to confirm what is possible.
-	Not offered in the variant.

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Furnaces – 1100°C max.

Precision furnaces for laboratory or light industrial / production use, over a temperature range of 300 to 1100°C.

The chamber is made of high thermal efficiency vacuum-formed ceramic fibre, with heating elements embedded in four sides and a ceramic tile to protect the fibre base from wear. These models have a lift-up door.

As standard, control and over-temperature protection thermocouples are Type N for prolonged life and consistent accuracy at 1100°C. We also offer the optional alternative of noble metal thermocouples, enabling a Resident SAT thermocouple (optional extra) to be used under AMS 2750F (Section 3.4.7.4).

By default, the over-temperature protection must be reset by the user if tripped. An audible over-temperature protection alarm buzzer can be fitted as an optional extra.

Typical lead-time for these models is 3-6 weeks.



Model	Total Volume	Maximum Work Zone (WxDxH)	Total Chamber Size External Size (WxDxH)	Power / Voltage / Plug	Weight
TMS SNOL 2750-8/1100	8.2 L	160 x 240 x 110mm 4.2 L	200 x 300 x 133mm 440 x 620 x 510mm	1.8kW / 230V / UK 13A	28kg
TMS SNOL 2750-13/1100	13 L	180 x 280 x 140mm 7.1 L	225 x 360 x 180mm 500 x 700 x 550mm	1.8kW / 230V / UK 13A	38kg
TMS SNOL 2750-22/1100	22 L	240 x 400 x 130mm 12.5 L	275 x 500 x 155mm 600 x 890 x 610mm	3kW / 230V / Blue 16A	58kg
TMS SNOL 2750-39/1100	39 L	280 x 400 x 190mm 21.3 L	315 x 515 x 225mm 650 x 900 x 740mm	6kW / 400V / Red 16A	74kg

Power Connector: UK 13A = BS1363. Blue = IEC60309. Red = IEC60309, 5-pin 3P+N+E (Star+N)

Model Variant	Class 4 (±10°C)	Class 3 (±8°C)	Class 2 (±6°C)	Class 2 & RPS (±5°C)	Class 1 (±3°C)
TMS SNOL 2750-8/1100 D	✓	Area TBC	-	-	-
TMS SNOL 2750-13/1100 D	✓	Area TBC	Area TBC	Area TBC	?
TMS SNOL 2750-22/1100 D	✓	Area TBC	Area TBC	Area TBC	?
TMS SNOL 2750-39/1100 D	✓	Area TBC	Area TBC	Area TBC	?
TMS SNOL 2750-8/1100 E	✓	Area TBC	-	-	-
TMS SNOL 2750-13/1100 E	✓	Area TBC	Area TBC	-	-
TMS SNOL 2750-22/1100 E	✓	Area TBC	Area TBC	-	-
TMS SNOL 2750-39/1100 E	✓	Area TBC	Area TBC	-	-

Key	
✓	Achievable with the full work zone, typically over the full temperature range.
Area TBC	Achievable subject to a slightly reduced Work Zone, depending on the temperature range. The working area will be confirmed during testing before the final survey.
?	May be achievable subject to a much reduced Work Zone, depending on the temperature range and the load. Testing will be required to confirm what is possible.
-	Not offered in this variant.

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Furnaces – 1200°C max.

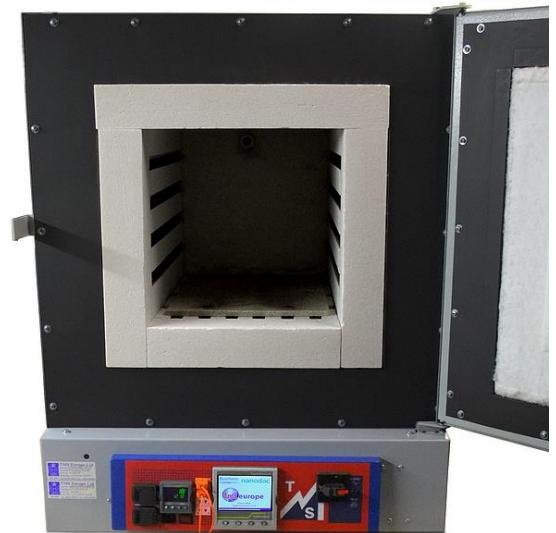
Precision furnaces for laboratory or light industrial / production use, over a temperature range of 300 to 1200°C.

The chamber is made of high thermal efficiency ceramic fibre, with semi-exposed heating elements in the bottom and sides, and a ceramic tile to protect the fibre base from wear. This model has a sideways-opening door.

As standard, control and over-temperature protection thermocouples are Type R in ceramic for prolonged life and consistent accuracy at 1200°C. As such, as a Resident SAT thermocouple (optional extra) may be used under AMS 2750F (Section 3.4.7.4).

By default, the over-temperature protection must be reset by the user if tripped. An audible over-temperature protection alarm buzzer can be fitted as an optional extra.

Typical lead-time for these models is 5-8 weeks.





Model	Total Volume	Maximum Work Zone (WxDxH) 17.6 L	Total Chamber Size External Size (WxDxH)	Power / Voltage / Plug	Weight
TMS SNOL 2750-40/1200	40 L	220 x 320 x 250mm 17.6 L	295 x 420 x 295mm 645 x 870 x 835mm	3.4kW / 230V / Blue 16A	74kg

Power Connector: IEC60309


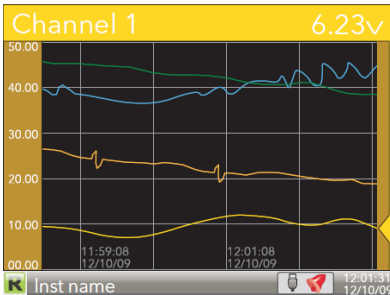
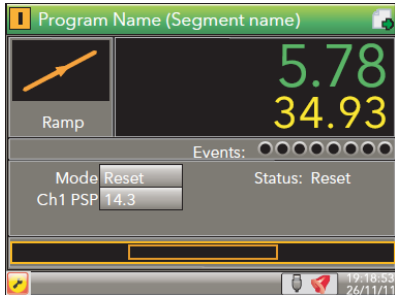
Model Variant	Class 4 (±10°C)	Class 3 (±8°C)	Class 2 (±6°C)	Class 2 & RPS (±5°C)	Class 1 (±3°C)
TMS SNOL 2750-40/1200 D	✓	Area TBC	Area TBC	Area TBC	?
TMS SNOL 2750-40/1200 E	✓	Area TBC	Area TBC	-	-

Key	
✓	Achievable with the full work zone, typically over the full temperature range.
Area TBC	Achievable subject to a slightly reduced Work Zone, depending on the temperature range. The working area will be confirmed during testing before the final survey.
?	May be achievable subject to a much reduced Work Zone, depending on the temperature range and the load. Testing will be required to confirm what is possible.
-	Not offered in the variant.

Standard Instruments

Type E variant: Eurotherm 3216	Type E+ variant: Eurotherm EPC3016
	
<p>Temperature Controller 1/16th DIN Size (~48x48mm).</p>	<p>Temperature Controller and Programmer 1/16th DIN Size (~48x48mm). 1 Timed Program with 8 Segments each (more optional) Connection to a laptop or PC network via Ethernet RJ45 port on front panel. Includes PC software for easier creation, editing and backup of timed programs.</p>

Type D variant: Eurotherm nanodac

		
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Temperature Controller, Programmer and Recorder.

- 3.5", 320 x 240 pixel, colour display. ¼ DIN Size (~96x96mm).
- Secure data recording in tamper-proof format (meeting AMS 2750F; Section 3.2.7.1.1)
- 50MB internal memory – approx. 250 days (with 4 channels recording at 10 sec. interval)

Recording: 4 channels. By default records control and over-temp and 2 additional channels (if used).

Programmer: Enabling time/temperature profiles/programs to be set up by the user. With up to 100 programs, each program supporting 25 segments. Programs can be entered or modified via the front panel or by PC software (included). We can optionally pre-enter your programs, at additional cost.

Connection to a laptop or PC network via Ethernet RJ45 port on front panel. Includes PC software for easier creation, editing and backup of timed programs. Data export to a networked FTP file server.

USB port on the front panel for recorded data export via a USB flash drive/memory stick.

Additional Options

- Type D variants: without Programmer (economy option)
- Type D variants: Separate OTP accessible thermocouple connection (not recorded)
- Type E+ variants: RS-485 instead of Ethernet
- Type E+ variants: 10x24 Programmer (instead of 1x8)
- OTP (Over Temp.): Omron controller instead of Eurotherm controller (economy option)
- Additional Thermocouples meeting AMS 2750F (for Load, or High/Low monitoring)
- SAT Thermocouples meeting AMS 2750F
- Other instruments can fitted (e.g. to accommodate a site-wide convention). There may be additional cost and lead-time, for setting them up for AMS 2750F with our units.
- Gas inlet (note that the chamber is not gas tight and additional precautions must be taken)
- Furnaces: Chimney (this may reduce the temperature uniformity Class that can be achieved)

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Other Solutions for AMS 2750 from TMS Europe

TMS Europe are specialists in calibration, both in the laboratory and on-site, providing our Aerospace and Automotive sector customers with accurately calibrated instrumentation, sensors, thermocouples and cable, ensuring the products meet all required specifications.

As an ISO17025 (UKAS) accredited calibration laboratory you can be certain that your calibration results are not only accurate, but presented to meet the requirements of AMS 2750, Nadcap Audit, Rolls Royce RPS 953, CQI-9 and MIL specs.

With all our calibration standards meeting the requirements of Table 3 of AMS 2750F, we are in a unique position, having a long association with the aerospace and heat treatment sectors, we are able to provide a one-stop shop, for the following services:

- Supply and calibration of ovens and furnaces
- Supply and calibration of process control & recording equipment
- Supply with calibration of control, SAT and TUS thermocouples
- Calibration of your instrumentation (on-site or in our laboratory)
- Thermal surveys (TUS)

TMS also offers calibrators and portable survey recorders, for instrument calibrations and TUS, complete with calibration by our ISO 17025 lab, meeting AMS 2750F.



As an independent UK sensor manufacturer, TMS makes TUS thermocouples, batch calibrated by our ISO 17025 lab and so meet AMS 2750F.



TMS also offers on-site calibration and thermal surveys meeting AMS 2750F. Our calibration engineers can perform traceable or ISO 17025 (UKAS) accredited calibration.



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