



Thermo Scientific Safety and High Precision Ovens

For special drying and testing applications

Ovens to meet your specific heating requirements

Thermo Scientific™ Safety and High Precision Ovens are designed for a variety of drying and heating scenarios. Whether you are looking for an oven to dry flammable solvents, test cables, test in a particle reduced environment, or other specific applications, our ovens will allow you to safely achieve the results you desire.

Choose the safety and high precision oven with the features you need:

For standard drying and heating ovens, visit our vacuum ovens portfolio at thermofisher.com/hot.

This brochure focusses on ovens that are suitable for the following applications:

1. Heating and drying with presence of flammable solvents

The presence of flammable solvents causes safety hazards, with risk of explosion and fire - which are not addressed in standard ovens. We offer three types of ovens that address these safety hazards with specific safety features. Typical applications for this type of ovens are:

- Drying of lacquers and paints, e.g. for testing or quality control
- Drying processes with presence of flammable components in development, testing or production of chemicals, pharmaceuticals and cosmetics
- Drying or heat treating of electronics or metal parts; solvents are often used for cleaning purposes or in production steps

2. Heating for test purposes

In many test protocols the exposure with heat is used in process steps. Heating samples can e.g. mimic specific environmental circumstances, or aging processes. Other test protocols provide information on how samples withstand defined temperatures or temperature changes. Oxidation, tempering, changing the quality of material are all examples for heat testing.

Testing applications often require very precise temperature control with low temperature fluctuations over time, and ideally low spatial temperature differences within the oven chamber. Air exchange rates are sometimes part of a process protocol, e.g. in cable testing. Some applications require a high maximum temperature, e.g. in tempering or stress relaxation tests. Our various test ovens provide solutions to address these requirements.

3. Heating and drying custom projects

Our custom projects department can modify ovens to address specific requirements beyond our standard offerings. Typical examples are additional access ports for measurements, or specific purposes. But we also address gastight chambers for inert gas applications, some testing oven solutions, and specific control requirements. Modifications are based on the Heratherm™ heating and drying ovens and Vacuotherm vacuum ovens.

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Thermo Scientific Safety and High Precision Ovens selector guide

	Solutions for drying and heating with presence of flammable solvents				Solutions for thermal testing with focus on high temperature accuracy			
	LUT6050 / LUT6050F	FT6060	VT6000M-BL	VT6000P-BL	WU6100	Precision High Performance	OGH TK	UT6050
Usable Chamber Size	105L	52L	53, 128L	53, 128L	95L	39, 112, 268L	47, 74, 132L	105L
Working Temp	+50°C to 250°C	Ambient +5°C to 70°C (T4) / to 105°C (T1, T2, T3) *	Ambient +15°C to 200°C	Ambient +10°C to 300°C	+50°C to 500°C	Ambient +15°C to 325°C	50°C – 250°C	50°C – 250°C
Oven Specifics	Work with coating materials containing limited quantities of solvents – suitable for operations with a fire risk.	Handle unlimited quantity of solvents of temperature classes T1, T2, T3 and T4 - with temperature limitations	Handle unlimited quantity of flammable solvents, with no temperature limitations		For heat treatment under demanding condition (high and uniform temp, high air change)	Efficient heat transfer and reproducible test conditions for rapid heat-up and shortened recovery where door opening is frequent.	For ageing test of rubber and plastic materials according to the standards of cables and insulated electrical leads	For ageing test of rubber and plastic materials according to the standards of cables and insulated electrical leads
Typical applications (examples)	Burning, curing, drying, testing of lacquers, varnishes and adhesives	Drying of flammable solvents in research, quality control and production	Heat treatment of sample in presence of flammable solvents in research, quality control and production		Coating, distorting, metal forming, stress relaxation, tempering, thermal testing	Testing with precise temperature control and high air exchanges	Rubber / plastic testing at precise temperature control and defined air exchange rates.	Cable testing at precise temperature control and defined air exchange rates.
Specific application requirements	Safe heating and drying of samples that contain flammable solvents	Safe heating and drying of samples that contain flammable solvents	Safe heating and drying of samples that contain flammable solvents under vacuum or low pressure inert gas atmosphere		High temperature with precise temperature control	Precise temperature with high airflow	Precise temperature with gravity convection	Precise temperature with mechanical convection
Technical details	High airflow to prevent explosive / flammable mixture to develop; emergency inertisation		Heating will only work under vacuum to prevent explosive / flammable mixture to develop; emergency inertisation		High temperature Heating elements in 5 walls	Turbo blower for user-adjustable high air change and unparalleled temperature uniformity	Gravity convection; inner aluminum chamber	Mechanical convection
Ordering details	Not available in North America	Not available in North America	Not available in North America		Not available in North America	Not available in Europe	Orders will be handled by our custom projects department	Orders will be handled by our custom projects department
Detailed technical specifications and dimensions on page:	Page no. 12	Page no. 16	Page no. 19		Page no. 26	Page no. 23	Page no. 28	Page no. 30

* See page 7 for details on temperature classes T1, T2, T3, T4

Drying with presence of flammable solvents

The chemical and pharmaceutical industries, dyestuff, varnish, lacquer and paint industries, electronics, the process manufacturing sector and a large number of other industries are dependent on heat treatment and drying processes, in which combustible solvents are released, which can produce potentially explosive mixtures when they come into contact with air.

The dangers involved in the various applications are frequently underestimated or are simply unknown. Laboratories should check all safety precautions implemented for the respective application to ensure operator safety in all instances.

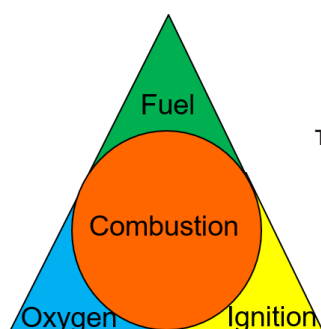
Typical application examples for laboratory ovens are found in research and development and quality departments:

- Sample drying (e.g. paint, dye, glue)
- Heat treatment as a process step (e.g. lacquers, metal parts)
- Drying of samples after a cleaning cycle in solvents (e.g. metal parts, electronics)

The fire triangle illustrates the three conditions that are required to cause fire or explosion:

- There must be a fuel (the flammable gas or vapor, or combustible dust) in ignitable quantities
- There must be an ignition source (energy in the form of heat or a spark) of sufficient energy to cause ignition, and
- There must be oxygen, usually the oxygen in the air

Remove any one or more of these three and a fire or explosion cannot occur.



The fire triangle

Thermo Scientific offers several ovens solutions for use with flammable solvents. These ovens include specific safety features aiming to remove one or more of the three conditions. In addition, precautions are taken to address the unlikely event of technical issues, such as overheating / fan failure / disconnection of electrical circuit etc.

Thermo Scientific Safety and High Precisions Ovens have been specifically tested and certified for use with flammable solvents, according to European standards. Selecting the right solution for the application is critical for a safe process. Note that maximum temperatures, type and amount of solvents are determining factors for the choice. The operator has to be knowledgeable about the specifics and handling of the solvents used.

Please refer to the product table on the following page to choose the right solution for your specific application. Some typical applications for each solution are listed. Criteria are the process temperature, the amount of solvents used in the process, or specific requirements, such as the need to run the application without presence of oxygen or explicitly under vacuum.

- For handling of limited amount of solvents, temperatures up to 250°C: High airflow oven LUT6050 / LUT6050F (ideal for drying of paint / lacquer)
- For handling of unlimited amount of solvents, temperatures up to 105°C: High airflow oven FT6060 (great for heat treatment of e.g. electronics or metal parts)
- For temperatures up to 200°C - with unlimited amount of solvents: Vacutherm™ vacuum ovens with jacket heating VT6060M-BL and VT6130M-BL (Safe solution - even with high amount of flammable solvents)
- For temperatures up to 300°C - with unlimited amount of solvents: Vacutherm™ vacuum ovens with shelf heating VT6060P-BL and VT6130P-BL (Safe solution - even at high temperatures)

Assessment of the explosion hazard

As outlined on page 6 ("fire triangle"), under atmospheric conditions, three conditions are required for an explosion:

- Fuel (the flammable gas or vapor, or combustible dust) in ignitable quantities
- Ignition source (energy in the form of heat or a spark)
- Oxygen

Temperature classification (also known as temperature class, or T class) defines the maximum surface temperature that a product destined for use in a potentially hazardous atmosphere is allowed to operate at, relative to an ambient temperature of -20°C to +40°C. The higher the temperature class, the lower is this maximum surface temperature.

Why is Temperature Class Important?

All flammable gases have an auto-ignition temperature. If a flammable mixture of the gas is exposed to a component above the auto-ignition temperature then the mixture will ignite. Therefore, when selecting equipment, the temperature class must be below the auto-ignition temperature of the potentially explosive atmosphere where it will be installed.

If several different flammable materials may be present within a particular area, the material that gives the lowest auto ignition temperature dictates the overall area classification, and hence T-class.

The table below shows the maximum application temperature of the different ovens for flammable solvents,



The clearly arranged operator control elements enable safe, uncomplicated operation of the FT 6060.

based on temperature class of the solvent used. Please use this information to choose the best oven for you application.

Temperature classes and maximum temperature settings of FT6060

Temperature Classes	T1	T2	T3	T4
Maximum surface temperatures	450 °C	300 °C	200 °C	135 °C
Temperature limit	360 °C	240 °C	160 °C	108 °C
Example of solvents	acetone benzene toluol	ethyl alcohol i-amyl acetate n-butyl acetate	benzene kerosene n-hexane	acetaldehyde ethyl ether
Maximum application temperature of the FT 6060	105 °C	105 °C	105 °C	70 °C
Maximum application temperature of the LUT6050	Admissible amount of solvent and temperature setting has to be determined and documented by operator - based on EN 1539, chapter 16			
Maximum application temperature of the Vacutherm VT M-BL ovens	200°C	200°C	200°C	200°C
Maximum application temperature of the Vacutherm VT P-BL ovens	300°C	300°C	300°C	300°C

Thermo Scientific Ovens and Vacuum Ovens for use with flammable solvents:

	Oven for use with limited amount of flammable solvents	Oven for use with unlimited amount of flammable solvents	Jacket heated Vacutherm Vacuum Oven	Shelf heated Vacutherm Vacuum Oven
Model name	LUT6050 / LUT6050F	FT6060	VT6000M-BL	VT6000P-BL
Chamber Size	105L	52L	53, 128L	53, 128L
Working Temp	Up to 250°C	Ambient +5°C to 105°C	Ambient +15°C to 200°C	Ambient +10°C to 300°C
Temperature uniformity	±2°C at 250°C	±3°C at 105°C ±2°C at 70°C	53L: ±1.5°C at 70°C ±3°C at 150°C ±4°C at 200°C 128L: ±2°C at 70°C ±5°C at 150°C ±7°C at 200°C	53L: ±1.5°C at 70°C ±2°C at 150°C ±6.5°C at 300°C 128L: ±1.5°C at 70°C ±3°C at 150°C ±7°C at 300°C
Temp deviation over time	< ±0.3°C at 250°C	± 0.5°C at 105°C	<0.5°C at 200°C	<1% at 200°C
Over-temp protection mechanism	Class 2 over-temp limit cut-out	Class 2 over-temp limit cut-out	Class 2 over-temp limit cut-out	Class 2 over-temp limit cut-out
Shelving	Standard 2 Maximum 9	Standard 2 Maximum 9	53L: std. 2 / max. 4 128L: std. 3 / max. 5	53L: standard 2 128L: standard 3
Maximum Load	10kg per shelf 50kg per device	15kg per shelf 30kg per device	20kg per shelf per device: 40kg (53L) / 60kg (128L)	
Air changes (per hour)	252 per hour at 20°C	250 per hour at 20°C	no air changes - under vacuum	
Applications, specifics on used solvents	To work with coating materials containing limited quantities of solvents – suitable for operations with a fire risk.	To handle unlimited quantity of solvents of temperature classes T1, T2, T3 and T4	Equipped with an additional device for the interior's protection against explosion, it is suitable for laboratories without limiting the quantity of flammable solvents	
Typical applications (examples)	Burning, curing, drying, testing of lacquers, varnishes and adhesives	Drying of flammable solvents in research, quality control and production	Drying of flammable solvents in research, quality control and production under vacuum	
Safety features in short	High air exchange rate, emergency inertisation	High air exchange rate, emergency inertisation	Heating/drying under vacuum, emergency inertisation	
Certification	CE, EC ATEX directive	CE, EN 1539	CE, EC ATEX directive (interior)	
Choose based on application requirements	Application temperature up to 250°C; limited amount of solvents	Application temperature below 105°C; unlimited amount of solvents	Application temperature up to 200°C; unlimited amount of solvents	Application temperature up to 300°C; unlimited amount of solvents
Warranty	2 years (parts and labor)			

Operator's responsibilities:

1. Determine temperature class of solvent, and ensure the type of solvent can be handled by the oven.
2. Ensure the temperature setting is not too high, based on type of solvent.
3. Calculate admissible amount of solvents (based on standard EN1539) and ensure it's not exceeded.
4. Verify the inert gas container for emergency inertisation is full and properly connected

LUT 6050 drying ovens for coatings

Safety features for your laboratory

The drying of lacquers and other coating materials is inherently hazardous because the released solvents can form explosive gases with air. The Thermo Scientific LUT Drying Oven Series has been specially developed for these drying processes.

LUT 6050:

for installation in a normal environment, complies with protection category IP 22.

LUT 6050 F:

for installation in areas exposed to fire risks (e.g. where lacquers are handled). Model LUT 6050 F complies with protection category IP 54.

An additional feature of the F model (versus the standard model) is the protection of the control compartment by air filters for supply and exhaust air. These filters ensure no critical vapours from the room can get close to the electronic parts of the oven. This eliminates risk of electrical sparks causing fire or explosion.

The LUT Safety Concept

In order to prevent the formation of an explosive atmosphere, it is necessary to rarefy the solvent vapours with fresh air. For this purpose, both LUT 6050 and LUT 6050 F are equipped with two radial fans. The fresh air is filtered and preheated before it enters the chamber. An efficient air circulation fan provides adequate airflow to mix the heated fresh air with the solvent vapours, thereby avoiding the formation of dangerous “vapour pockets”. A monitoring system constantly checks the oven atmosphere. It reacts instantly to any disturbance in the air supply system, e.g. a fan failure, and disconnects the heater. The ovens feature a temperature limit cut-out which protects both the unit and the load against fires.

Optical and acoustic alarms are triggered to indicate any kind of failure in the units.

The European Norm EN 1539:2015

The edition of January 2000 includes technical statutes for equipment which are met by both the Thermo Scientific LUT 6050 and LUT 6050 F models:

- ventilation of interior before heating is activated
- technical ventilation
- controlled air circulation and exhaust air
- overtemperature protection
- low temperature of the outer casing
- list of maximum admissible amounts of solvents across the entire temperature range
- compliance with protection category IP 54 covering installation in areas exposed to fire risks (LUT 6050 F only)



Avoiding the formation of “vapour pockets” by a well directed air supply system

Helps reduce risk in drying

Efficient

In routine operation, the ovens are loaded and unloaded several times a day. Samples at ambient temperature need to be heated-up quickly. In order to optimise drying times, the heating power and the air supply of both the LUT 6050 and LUT 6050 F is rated such that introduced samples are rapidly heated-up to working temperature.

Fully equipped

Both the LUT 6050 and LUT 6050 F come standard with:

- Kelvitron™ microprocessor controlled temperature controller with single setpoint functionality
- Adjustable temperature limit cut-out in compliance with Thermal Safety Class 2 as stipulated in DIN 12880
- Optical and acoustic alarm system
- Readjustable door to ensure tight closure
- Stainless steel drip pan to prevent dripping on chamber bottom

Reliable and precise

For the drying and baking of lacquers and glues, spatial temperature distribution is crucial. The specific air circulation of both the LUT 6050 and LUT 6050 F prevents the uncontrolled penetration of cold ambient air and eliminates interference with the prevailing temperature inside.

Thus the instruments achieve a very good spatial temperature deviation of ± 2 K at 250 °C.

Functional

The inner chamber and all fittings are made of stainless steel (EN 1.4301 / AISI 304). Insulating materials are free of surface-active substances, i.e. no silicone is used.

Easy-to-service

- Air intake-filters can be easily replaced from the front
- Service and maintenance contracts available on request
- Please contact your local Unity Lab Services office for more information



Calculating admissible amount of solvent per load

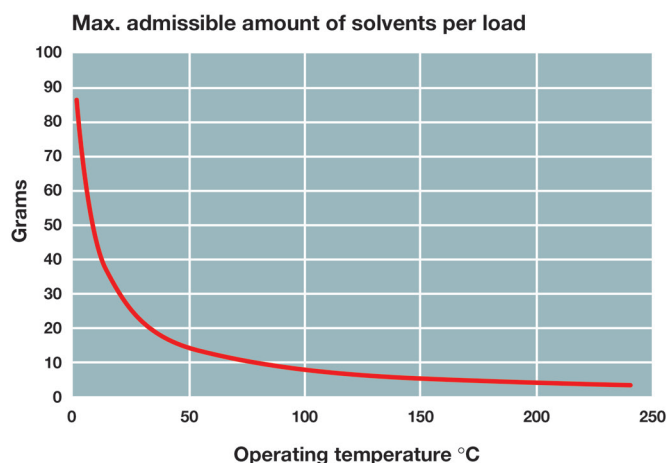
The calculation of the maximum amount of solvents allowed in the LUT ovens is based on:

- Solvents of 100 g/mol molar mass M
- Lower explosion limit (at 20 °C) of 40 g/m³
- Safety factor for the lower explosion limit (see area 1, diagram 1, appendix A, EN 1539): 25 %

The displayed curve illustrates the maximum admissible amount of solvent per load and defined drying temperature.

Example: The maximum admissible amount of solvent is approx. 6.2 g at a drying temperature of 135 °C.

For those coating substances whose lower explosion limits are known, the maximum admissible amount of solvent can be calculated separately in accordance with EN 1539.



Safety note:

The operator of the oven is responsible to ensure the maximum amount of solvents according to EN 1539 is not exceeded when loading the oven. The operator has to issue a process-specific loading instruction. Please refer to EN 1539 for all the details.

The accuracy of the instructions are crucial for the safety of the process. Exceeding the maximum amount of solvent in a drying process could lead to an explosion and fire!

Please note that Thermo Scientific cannot take this responsibility off the operator of the oven.



LUT Ovens specifications and order information



Specifications

	LUT 6050 Drying Oven for coatings	LUT 6050 F Drying Oven for coatings
	Cat. No. 50049643	Cat. No. 50049644
Dimensions		
Internal dimensions (W x H x D)	435 x 500 x 480mm	435 x 500 x 480mm
External dimensions (W x H x D) incl. door handle	860 x 815 x 730mm	860 x 815 x 730mm
Exhaust air socket Ø	100mm	100mm
Weight		
Net weight (approx.)	80 kg	
Temperature		
Rated temperature	250 °C	
Temperature deviation (spatial) ²⁾	±2 K	
Temperature deviation (time) ²⁾	< ± 0.3 K	
Shelves		
Number of shelves standard/maximum	2/9	
Dimensions (W x D)	405 x 448mm	
Useful area/shelf	1,800 cm²	
Electrical		
Rated power	3.2 kW	
Power consumption at rated temperature	2.5 kW/h	
Heating-up time to 250 °C	< 60 min	
Rated voltage	230 V(AC)	
Rated frequency	50/60 Hz	
Volume		
Volume	105 l	
Total vapour space	120 l	
Exchanges of air	4.2 per min	
Min. exhaust air volume	30 m³/h	
Average air velocity	1.0 ± 0.2 m/s	
Admissible amount of solvents at 130 °C operating temperature ³⁾	6.5 g	
Protection Category		
Protection category in acc. with DIN 40 050 Part 1	IP 22	IP 54
Warranty		
Warranty	2 years (parts and labor)	

2) in acc. with DIN 12 880 Part 2 at rated temperature 3) pure flammable solvent (calculated in accordance with EN 1539); further information see graph page 11

Ordering information for oven accessories and options

All oven accessories are customer installed unless otherwise indicated.

Product	Description	Cat. No.
LUT accessories		
Wire-mesh shelf	Wire-mesh shelf Additional wire-mesh shelf, incl. 2 shelf supports	50047470

FT 6060 fresh-air laboratory oven with explosion-protected chamber

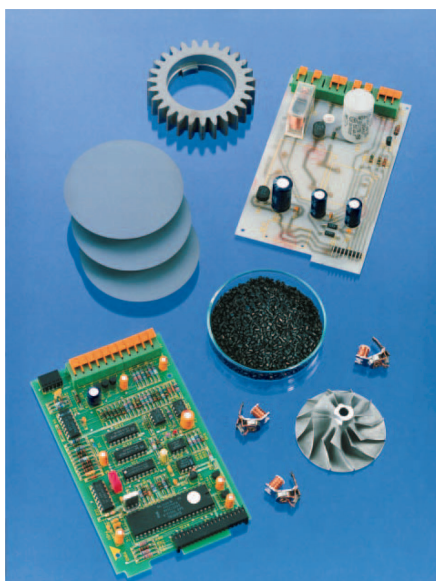
Security for your laboratory

As outlined on page 6, many industries and sectors are dependent on heat treatment processes in which combustible solvents are released, which can produce potentially explosive mixtures when they come into contact with air.

The FT 6060 prevents the build-up of hazardous conditions during heat treatment and the associated danger to the operating personnel and equipment.

Unlike other ovens available on the market, which are only capable of handling limited amounts of solvent, the FT6060 handles unrestricted quantities of solvents. This means that the FT 6060 offers a much higher degree of safety in day-to-day routine operations.

- Designed for solvents of temperature classes T1, T2, T3 and T4
- Unrestricted quantities of solvent
- Nominal temperature up to 105 °C
- Straightforward operation thanks to clearly arranged operator control elements



The FT 6060 has been designed for the heat treatment of finished or semifinished products in a wide range of industrial sectors, e.g. electrical engineering and the chemical and pharmaceutical industries.

Wide range of possible applications

The FT 6060 can be installed in all research, development and application laboratories where combustible solvents of temperature classes T1, T2, T3 and T4 as well as explosion classes IIA and IIB are used, or where such solvents are released in unknown quantities when material is being dried.

The dangers involved in the various applications are frequently underestimated or are simply unknown. Every laboratory should attach particular importance to checking the safety precautions implemented for the respective application. The FT 6060 covers a wide range of danger classes comfortably and therefore offers an ideal solution for all hazardous applications.

The straightforward arrangement of the control elements in the switching unit enables particularly safe and easy operation.



Safety concept of FT6060

The FT 6060 prevents the simultaneous occurrence of the four conditions required to produce an explosion (refer to “Assessment of the explosion hazard” below).

The surface temperature in the inner chamber is kept below the maximum permitted temperature limit for the respective temperature class. This helps prevent risk of an explosion, even in the event of a technical failure.

In addition to this, there is a continuous current of fresh air flowing through the cabinet, so that the released solvent vapours are carried away immediately.

If the fan breaks down, the heating circuit is interrupted and the connection between the inner chamber and the heater area is flushed with inert gas or compressed air, to help reduce danger from the oven.

Safety you can rely on

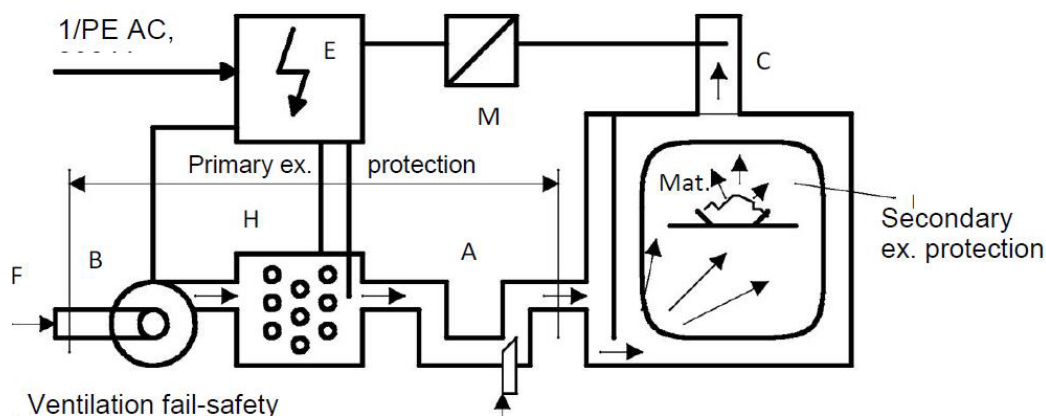
Several decades of experience in the field, high quality components and an automatic control circuit guarantees safe operation of the FT6060 fresh air oven.

Every single unit is thoroughly tested before leaving the factory, including safety relevant aspects, thermal check, tests and measurements of inlet and exhaust air.

The interior chamber of the FT6060 is rated as “Zone 2” according to VDE0100 Part 720. Zone 2 is defined as an area in which gases, vapours or mist can only be expected to produce a dangerous, potentially explosive atmosphere rarely and then only for a brief period.

Process diagram and explosion protection

Figure 1/3: Process diagram and explosion protection



E - Electr. switchbox
F - Fresh air

M - Flow monitor
B - Blower

C - Exhaust-air connector
H - Heating register

I - Inner comp
A - Air duct

The blower (B) draws fresh air (F) in from a neutral area. The fresh air is heated by the heating register (H) and is passed into the inner chamber of the unit (I) via an air duct (A).

The baffles in the inner chamber distribute the heated fresh air which, together with the vapours released during the heat treatment, is subsequently discharged from the exhaust-air connector (C) as vapour/air mixture.

The operating temperature is controlled by an electronic controller (in E).

The controller can be used to set the operating temperature in the inner chamber up to 105 °C (T 3) or 70 °C (T 4), depending on the articles or materials undergoing heat treatment.

A second temperature controller prevents overheating of the treated articles (material protection).

FT6060 accessories and installation

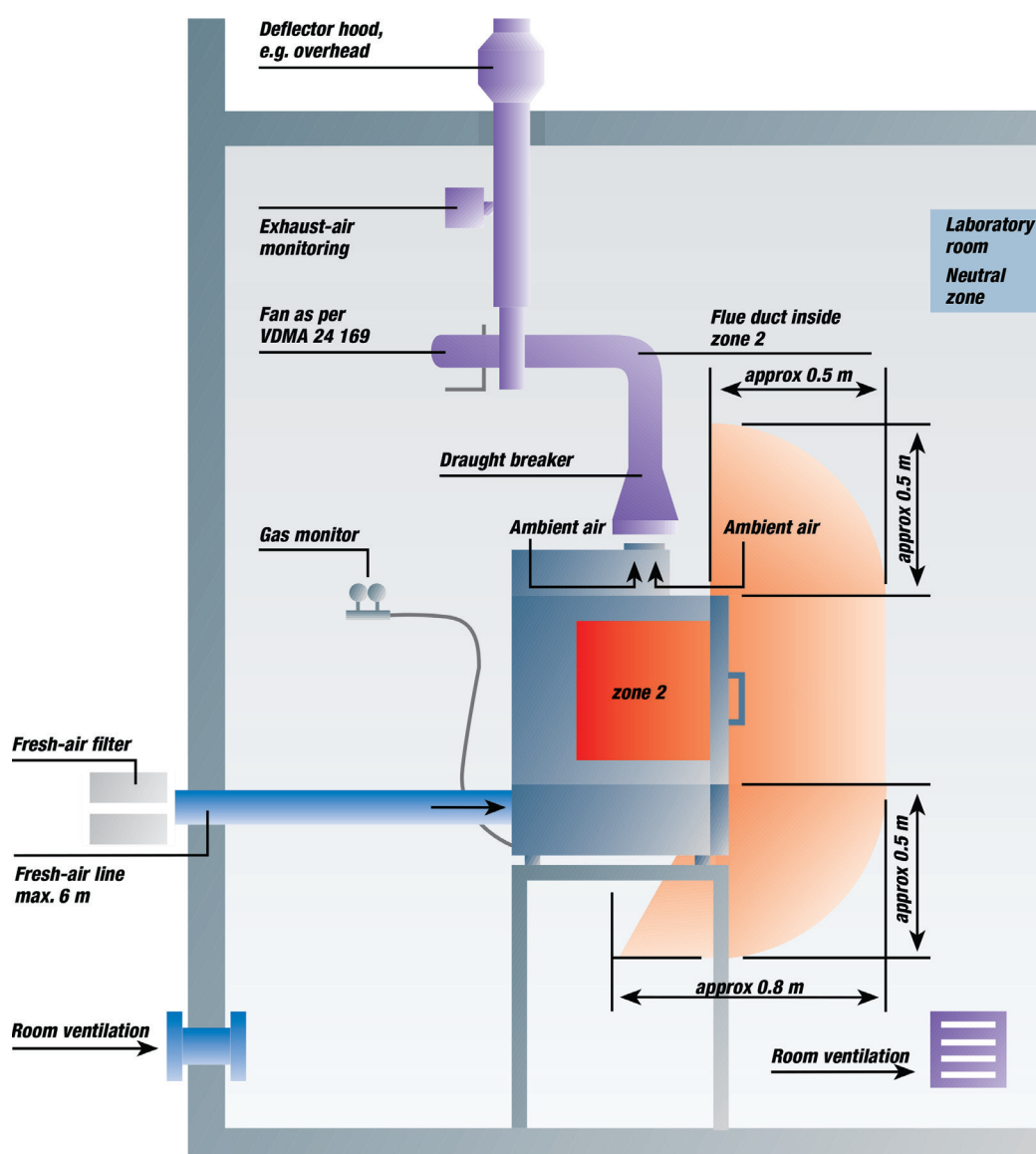
Accessories

- Draught breaker – to prevent problems in the air-flow and ventilation conditions in the oven
- Fan (exhaust air) – for the extraction of solvent vapours
- Fresh-air filter – filters the incoming fresh-air supply
- Support frame to bring unit up to counter level (780mm high)
- Additional shelf with shelf holders
- Viton gasket for silicone-free applications

Installation

The proper set-up and connection of the oven with fresh air and to an exhaust is crucial to ensure safe operation. The interior chamber of the FT6060 is rated as “Zone 2” according to VDE0100 Part 720. Zone 2 is defined as an area in which gases, vapours or mist can only be expected to produce a dangerous, potentially explosive atmosphere rarely and then only for a brief period. Electrical equipment should not be installed in the vicinity of zone 2 or, if this is unavoidable, such equipment must comply with DIN VDE 0165. For installation of the FT6060, supply of inert gas or compressed air is required. Gas and connecting tube are not part of the oven delivery. A hose with 4mm diameter should be connected at the back side of the oven. Pressure of inertgas or compressed air supply should be 1 bar.

Installation diagram



FT6060 fresh-air laboratory oven specifications and order information

Specifications

	Fresh-air Laboratory Oven FT6060 standard model	Fresh-air Laboratory Oven FT6060 with door window
	Cat. No. 50035800	Cat. No. 50045803
Dimensions		
Outside dimensions (housing) (W x H x D)	600 x 794 x 640mm	
Chamber volume	52 litres	
Chamber dimensions (W x H x D)	403 x 380 x 339mm	
Weight		
Empty weight	92 kg	
Temperature		
Operating temperature from room temperature +5 °C to	70 / 105 °C ¹⁾	
Temperature deviation at 105 °C (spatial) ²⁾	±3 °C	
Temperature deviation at 105 °C (temporal) ²⁾	± 0.5 °C	
Warm-up time to nominal temperature	50 min	
Heat Radiation to the surrounding areas	1.3 kW	
Air exchange	35m³/h	
Shelves		
Number of shelves standard/maximum	2/9	
Dimensions (W x D)	387 x 335mm	
Electrical data		
Operating voltage	230V, 1/PE AC	
Frequency	50Hz	
Connected load	1.46kVA	
Gas supply		
Type of gas	Inert gas or compressed air	
Input pressure	1 bar	
Warranty		
Warranty	2 years (parts and labor)	

1) Maximum operating temperature depends on temperature class of solvent, see page 7 2) in acc. with DIN 12 880 Part 2 at rated temperature * All quoted values are typical values measured for standard models and are subject to slight fluctuations.

Ordering information for FT6060 oven accessories and options

All oven accessories are customer installed unless otherwise indicated.

Product	Cat. No.
Draught breaker	50041374
Fan (exhaust air)	50043015
Fresh-air filter	50028869
Silicone-free door seal, made of Viton material	50027747
Additional wire mesh shelf set (1 shelf, 2 supports)	50029413
Support frame, 780 mm in height	50045014

Vacutherm Vacuum Ovens for use with flammable solvents

The Vacutherm™ VT6060-BL and VT6130-BL Vacuum Ovens provide safety for use with unlimited amounts of flammable solvents. Samples can even be heated to high temperatures without danger, since the process is taking place under vacuum.

The ovens are therefore perfect for heat treatment applications with presence of critical solvents.

Key specifications:

- Rated temperature of 200 °C/300 °C
- Total volume of 53 and 128 l
- Interior according to ATEX

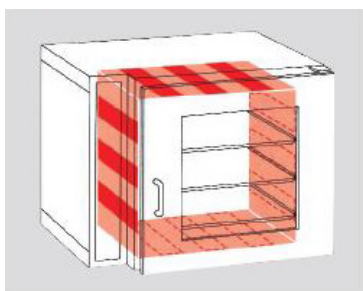
Choice of jacket heated and shelf heated models:

Jacket-heated, Model M: temperature range ambient +15°C to 200°C. Convenient control with digital display for single-setpoint: Kelvitron™ microprocessor controller.

Shelf heated, Model P: Temperature range ambient + 10°C to 300°C. The shelves incorporate heating coils supplying direct heat transfer to the load. Digicon™ multi-channel controller, controlling temperature on each shelf (single setpoint).

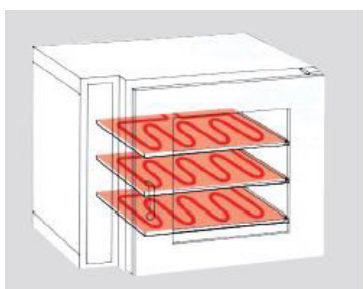


Models VT6060 and VT6130



Model M, jacket heating:

- Rated temperature of 200°C
- The large direct contact heating elements are reinforced at the front and therefore compensate natural loss



Model P, shelf heating:

- Rated temperature of 300°C
- Rapid heating-up times
- Direct heat transfer ensures short process times
- Separate temperature control and overtemperature protection for each shelf

Vacutherm Vacuum Ovens features

Standard features:

- Upper limit cut-out for oven and sample protection
- Additional precision valve for gentle ventilation
- Inert gas connection for controlled atmosphere. A safety valve prevents overpressure inside the vacuum chamber
- DN 25 access port in the rear wall
- Stainless steel vacuum fittings, tubing and ball valve

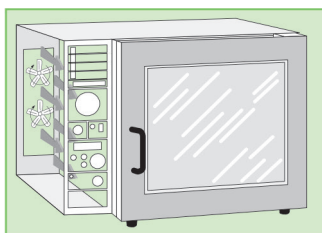
The special features to address use with flammable solvents

In addition to the standard version these vacuum ovens for flammable solvents also feature a forced release of inert gas system which, in the event of a leakage, prevents the formation of explosive mixtures inside the vacuum chamber above about 130 mbar*. Furthermore the heating elements are only activated once the pressure inside the vacuum chamber is below about 35 mbar*.

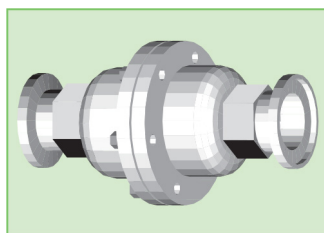
An optional flame filter prevents the spread of flames to protect the vacuum oven from sources of ignition. The flame filter is recommended for applications with solvents with ignition temperatures of < 21 °C.

Safe, user friendly operation: The VT 6000 BL's safety concept has no limitations to working temperatures. Elaborate calculations of working temperature – due to the composition of solvents are therefore not required.

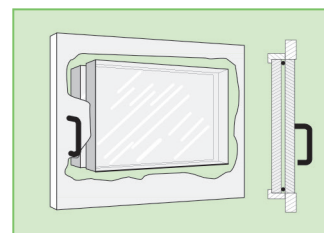
* Based on ambient pressure level of 1000 mbar; values varie depending on ambient pressure level.



Permanent ventilation of the control panel area through two independently operating fans, to prevent solvent leakage. There is no need of permanent feed with gas.



The optional flame filter prevents the spread of flames to protect the vacuum oven from sources of ignition. The flame filter is recommended for applications with solvents with ignition temperatures of < 21 °C.



Double pane door made of safety glass.

Safety concept

- Interior meets the requirements of Explosion Protection Guidelines (EC ATEX directive)*
- Pressure related activation of the heating elements
- Precision control valve allows inert gas operation
- Forced release of inert-gas in case of an accidental increase in pressure

Due to the ATEX safety features heating operation under atmospheric pressure is not possible with these -BL models. Standard models are available which can be used for such applications – without the presence of solvents.

Vacuum pump

The vacuum ovens require the connection of a vacuum pump for operation. Vacuum operation to 20 mbar can be obtained using a single stage mechanical pump with a free air capacity of at least 35 liters per minute.

The pump is part of the oven safety concept, and ensures safety beyond the oven. Therefore it has to be certified for use with flammable solvents.

Please contact a specialized pump supplier for support, such pumps are not available from Thermo Scientific. The oven has a standard DN25 connection for vacuum.

*The oven can only be used if this certification is in line with local regulations. Note: these ovens do not cover any North American regulations for flammable solvents, and therefore cannot be used in North America.

The Vacutherm ovens for flammable solvents can only be delivered in version as outlined. No options or accessories listed for the standard non-flammable models can be ordered with these ovens – since the ATEX certification is based on this exact set-up.

Thermo Scientific Vacutherm BL Vacuum Ovens

specifications and ordering information

Technical specifications

Cat. No.	51014546	51014548	51014547	51014549
Model	VT 6060 M-BL	VT 6060 P-BL	VT6130 M-BL	VT 6130 P-BL
Heating	Jacket-heating	Shelf-heating	Jacket-heating	Shelf-heating
Volume	53L, (1.87 cu.ft.)	53L, (1.87 cu.ft.)	128L, (4.52 cu.ft.)	128L, (4.52 cu.ft.)
Temperature range	Ambient +15°C to 200°C	Ambient +10°C to 300°C	Ambient +15°C to 200°C	Ambient +10°C to 300°C
Spatial temp. deviation ^{2,3}	±3°C @150°C ±4°C @200°C	±2°C @150°C ±6.5°C @300°C	±5°C @150°C ±7°C @200°C	±3°C @150°C ±7°C @300°C
Heat output (at max. temperature)	540Wh/h	450 Wh/h	870 Wh/h	880 Wh/h
Internal dimensions W x H x D	415 x 345 x 371 mm	415 x 345 x 371 mm	495 x 489 x 529	495 x 489 x 529 mm
External dimensions ¹ W x H x D	744 x 576 x 570 mm	744 x 576 x 570 mm	895 x 720 x 750 mm	895 x 720 x 750 mm
No. of shelves	2	2	3	3
Electrical	230V; 50/60Hz, 1.7kW	230V; 50/60Hz, 1.6kW	230V; 50/60Hz, 2.2kW	230V; 50/60Hz, 3.0kW
Plug type	CEE 7/7	CEE 7/7	CEE 7/7	CEE 7/7
Shipping weight	82kg (181 lb.)	90kg (198 lb.)	153kg (337 lb.)	164kg (362 lb.)

¹Depth without handle and wall distance. Dimensions: handle 70 mm, wall distance 80 mm ² The values stated apply to the empty oven and vacuum operation in acc. with DIN 12880, part 2 ³ Measured on the shelves

Pump connection: DN 25 – 25.4 mm / 1.0 in

Inert gas connection: inner diameter 4 mm / 0.16 in

Warranty: 2 years (parts and labor)

Ordering Alerts: Can only be operated if local regulations are based on EC ATEX directive. Not available for North America.

Certifications: CE and ATEX

Ordering information

Product	Description	Cat. No.
Factory calibration		
Calibration Certificate	Certificate of calibration for 150 °C at centre of the vacuum chamber	50044187
Additional Calibration	Calibration at an additional measuring point (max. 2)	50044188

Ordering information for accessories and options

Product	Description/Compatibility	Cat. No.
Flame filter	To be connected to vacuum port at rear wall, is recommended for applications with solvents with ignition temperatures of < 21 °C.	50042626
Support frame, 780 mm height	for VT 6060 M/P-BL	50029890
	for VT 6130 M/P-BL	50029597
Additional shelves, including shelf supports	for VT 6060 M-BL	50043975
	for VT 6130 M-BL	50043976
Tray	for VT 6060 M-BL made of stainless steel	50048621
	for VT 6060 M-BL made of aluminium	50048620
	for VT 6130 M-BL made of stainless steel	50048619
	for VT 6130 M-BL made of aluminium	50048618
Vacuum connection kit	Stainless steel vacuum connection kit for tubing with a diameter of 10 mm	50046860

Thermal testing with a focus on high temperature accuracy

Heat exposure is used in research and quality departments in many industries for testing of materials.

Aging of plastics or rubber is simulated with heat, certain materials are being stressed with exposure to defined heat levels. Often the temperature accuracy is very important for testing protocols in such material tests. Besides, the amount of oxygen can have an influence on the physical property of a material. The higher the air change, the more likely a sample will get oxidized. An oven with adjustable or defined air change value can therefore create and mimic a reproducible environmental condition for thermal aging and material testing.

There are a number of international norms that are used for the material testing.

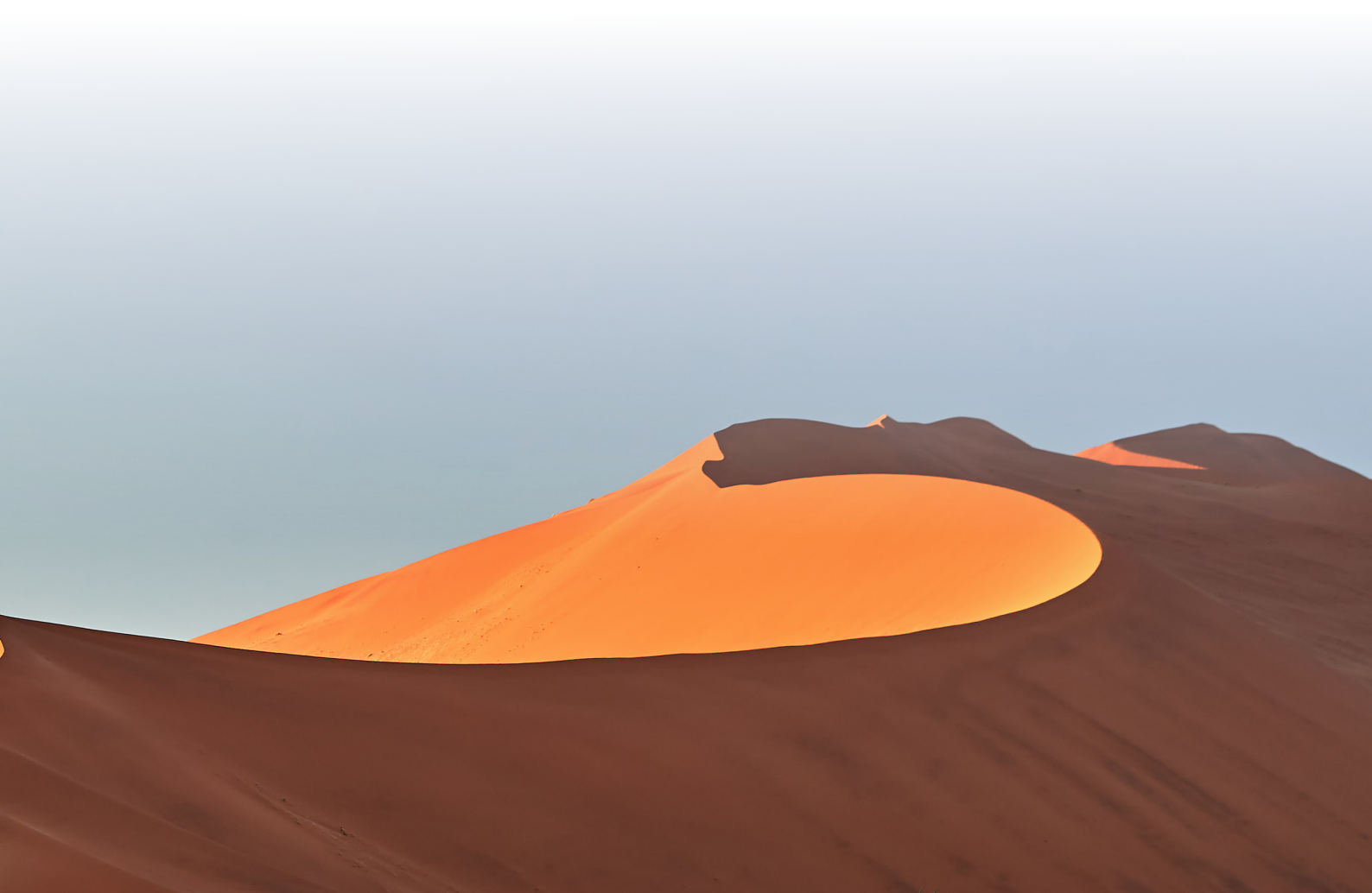
Thermo Scientific has three different series of special drying ovens to meet these unique and demanding material testing requirements.

- The high temperature oven WU6100 is rated at 500°C, and has excellent temperature stability and uniformity

in presence of high air changes. It is recommended for heat treatment of e.g. metals, plastics, and for tempering, annealing, ageing, stress testing applications.

- The Precision High Performance Ovens are designed to run up to 325°C with superb temperature uniformity. User-adjustable air changes can be as high as 195 per hour.
- The Heratherm™ “TK” oven and the UT6050 ovens are made by our Custom Projects department, and address specific test requirements in regards to the temperature accuracy, and air exchange rates. (Please ask your Thermo contact for a quote)

Please also check our standard Heratherm ovens line at www.thermofisher.com/hot, since the Advanced Protocol models offer tight uniformity and stability values, which cover many thermal testing protocol requirements.



Thermo Scientific ovens for specific testing requirements

	Precision High Performance	WU6100	OGH TK	UT6050
Test specifics	Precise temperature control, High air exchange	Precise temperature control, High temperature	Precise temperature control, Defined air exchange rates	Precise temperature control, Defined air exchange rates
Testing space	39, 112, 268L	95L	47, 74, 132L	105L
Working Temp	Ambient +15°C to 325°C	Up to 500°C	50°C – 250°C	50°C – 250°C
Temperature uniformity	Model 605: ±0.5°C at 100°C ±1.0°C at 200°C ±2.5°C at 300°C Model 625/625S: ±0.5°C at 100°C ±0.9°C at 200°C ±2.2°C at 300°C Model 645: ±0.5°C at 100°C ±1.0°C at 200°C ±2.1°C at 300°C	Damper closed: <± 1°C at 100°C <± 2°C at 300°C <± 4°C at 500°C Damper open: <± 5°C at 100°C <± 6°C at 300°C <± 7°C at 500°C	±0.75°C at 50°C ±1.0°C at 100°C ±1.25°C at 150°C ±1.5°C at 200°C ±2.5°C at 250°C	±1.6°C at 150°C ±3.9°C at 250°C
Temp deviation over time	±0.1°C	± 0.5°C at 500°C	< ±0.3°C at 150°C	± 0.5°C at 250°C
Over-temp protection mechanism	High limit control with visual alarm	Class 2 over-temp limit cut-out	Class 3.1 in principle with 2 PT100 sensors	Class 2 over-temp limit cut-out
Shelving	Standard 2 Max. 7 (605), 11 (625) and 12 (645)	Standard 2 Maximum 5	Standard 2	Standard 2
Maximum Load	20kg per shelf 50kg per device	15kg per shelf 45kg per device	15kg per shelf 50kg per device	10kg per shelf 50kg per device
Air change (per hour)	Model 605: 128 Model 625/S: 195 Model 645: 155	192 at 100°C 182 at 300°C 154 at 500°C	3-10 (DIN60811-1-2) 8-20 (DIN 53508, ISO 188)	8 - 20
Positioning	Efficient heat transfer and reproducible test conditions for rapid heat-up and shortened recovery where door opening is frequent. High air exchange rate.	For heat treatment under demanding condition (high and uniform temp, high air change)	For ageing test of rubber and plastic materials according to the standards of cables and insulated electrical leads; defined low air exchange rate.	For ageing test of cables and other materials according to the standards of cables and insulated electrical leads; defined air exchange rate.
Applications	For high temperatures and ultra-precise temperature control under air change condition	Coating, distorting, metal forming, stress relaxation, tempering, thermal testing	Ageing, distorting, materials testing, oxidizing, thermal testing	Ageing, materials testing, testing
Order information	see page 23	see page 26	ask your Thermo contact for a quote	

Precision high performance ovens

The Precision high-performance ovens are built for drying applications requiring high temperatures, ultra-precise temperature stability and reproducibility with a broad temperature range of ambient +15°C to 325°C.

The unique mechanical convection heating design consists of side-mounted turbo blowers. These circulate the heated air in horizontal airflow pattern. The concept provides extremely precise temperature control and fast drying.

Temperature uniformity is as precise as $\pm 0.5^{\circ}\text{C}$ at 100°C and $\pm 2.5^{\circ}\text{C}$ at 300°C , with excellent stability of $\leq \pm 0.1^{\circ}\text{C}$.

These ovens are ideal for test protocols that require high air exchange rates, with maximum rates as high as 195 per hour.

The intuitive single setpoint controls deliver detailed information on current temperature set-points. Built-in 12-hour mechanical timer along with user-adjustable safety thermostat allows for power cut-out in case of over-temperature.

High-limit safety with built-in circuit breaker protects the oven from power surges.

The stainless-steel interior with a solid chamber floor ensures easy cleaning. All non-tip shelves can be quickly and easily dismantled for thorough cleaning.

A fibreglass door gasket prevents heat loss and low-density heating elements ensure long life. High-quality, sturdy construction is beneficial in industrial settings. High efficiency insulation is beneficial for energy output.

The oven performance conforms to several US performance and uniformity standards:

- ASTM E145 Type IIA (specification of performance requirements for forced air ovens)
- ASTM D-2436 (specification for forced-convection laboratory ovens for electrical insulation)

These are typically relevant for in testing applications.

Two of the High Performance models provide features for specific applications:

Model 605P: An extra baffle provides low air flow for precise drying and testing of materials with minimal disruption of volatile components.

Model 625S: Features a rear blowout panel with retaining cage and positive action front-door catches for volatile material testing.

Note: Precision High Performance ovens do not carry the CE mark, and are not available in Europe.

Three Sizes

- 39 L (1.4 cu. ft.) holds 7 adjustable shelves (two included*)
- 113 L (4.0 cu. ft.) holds 11 adjustable shelves (two included*)
- 269 L (9.5 cu. ft.) holds 12 adjustable shelves (two included*)

(*Additional shelves are sold separately)



Model 625 – 113L (4.0 cu.ft.)

Specifications and ordering

Technical specifications

Catalog Number 120V (230V)	6050 (6051)	6050 (6053)	(6054)	(6055)	(6056)
Model	605	605P	625	625S	645
Net weight	230 lbs. (104.3 kg)	230 lbs. (104.3 kg)	252 lbs. (114.3 kg)	292 lbs. (132.5 kg)	415 lbs. (188.2 kg)
Electrical data					
120V; 50/60Hz	2500W / 20.8A	2500W / 20.8A	N/A	N/A	N/A
230V; 50/60Hz	2500W / 10.9A	2500W / 10.9A	3700W / 16.1A	3700W / 16.1A	4800W / 20.9A
Max. output power					
BTU/hour	8538	8538	12,636	12,636	16,393
Maximum air changes					
Air changes / hour	128	128	195	195	155
Temperature					
Temperature range	Amb. +15 °C to 325°C	Amb. +15 °C to 325°C	Amb. +15 °C to 325°C	Amb. +15 °C to 325°C	Amb. +15 °C to 325°C
Temperature display	Two lines, 4-digit LED	Two lines, 4-digit LED	Two lines, 4-digit LED	Two lines, 4-digit LED	Two lines, 4-digit LED
Temperature control	Microprocessor	Microprocessor	Microprocessor	Microprocessor	Microprocessor
Uniformity at 100 °C	±0.5°C	±0.5°C	±0.5°C	±0.5°C	±0.5°C
Uniformity at 200 °C	±1.0°C	±1.0°C	±0.9°C	±0.9°C	±1.0°C
Uniformity at 300 °C	±2.5°C	±2.5°C	±2.2°C	±2.2°C	±2.1°C
Control sensitivity	±0.1°C	±0.1°C	±0.1°C	±0.1°C	±0.1°C
Heat-up time to 325 °C	60 minutes	60 minutes	50 minutes	50 minutes	45 minutes
Recovery time ¹	2.5 minutes	2.5 minutes	4 minutes	4 minutes	4 minutes
Dimensions					
Chamber volume	1.4 cu. ft. / 39 L	1.4 cu. ft. / 39 L	4.0 cu. ft. / 113 L	4.0 cu. ft. / 113 L	9.5 cu. ft. / 269 L
Interior chamber dimensions (W x H x D)	14 x 13 x 13 in. (35.6 x 33 x 33 cm)	14 x 13 x 13 in. (35.6 x 33 x 33 cm)	19 x 19 x 19 in. (48.3 x 48.3 x 48.3 cm)	19 x 19 x 19 in. (48.3 x 48.3 x 48.3 cm)	36 x 24 x 19 in. (91.4 x 61 x 48.3 cm)
Exterior chamber dimensions (W x H x D)	38.5 x 25 x 24 in. (97.8 x 63.5 x 61 cm)	38.5 x 25 x 24 in. (97.8 x 63.5 x 61 cm)	45 x 29 x 28 in. (114.3 x 73.7 x 71.1 cm)	45 x 29 x 28 in. (114.3 x 73.7 x 71.1 cm)	65 x 36 x 31 in. (165.1 x 91.4 x 78.7 cm)
Shelves					
Supplied, Maximum	2 supplied, 7 max	2 supplied, 7 max	2 supplied, 11 max	2 supplied, 11 max	2 supplied, 12 max
Warranty					
Warranty	1 year (parts and labor)				

¹At 200 °C with 30-second door opening. ²Spacing between shelves is 1.6 in. (40 mm). All values are based on ASTM norm with 9 point measurement. All models are UL listed. Models require hardwired installation by a qualified technician.

Ordering information for accessories and options

Product	Compatibility with oven models	Cat. No.
Additional shelves, clips included	Model 605/605P	3166188
Additional shelves, clips included	Model 625/625S	3166179
Additional shelves, clips included	Model 645	3166180

500°C air circulation heating oven WU6100

Precise and high temperature

Air circulation heating oven WU6100

Temperature stability and stress tolerance of high-grade materials take on increasing relevance. Closely associated with these concerns is the steadily growing need for technically perfect heating and testing ovens. The oven model WU6100 addresses this need with precision for temperatures up to 500°C.

Top priority focuses on precision

Heating processes are used to alter material properties. During this heat treatment, the materials have to stay within a defined temperature range. A drift in temperature of a few degrees could ruin the whole process, or even destroy the samples.

The WU6100 oven addresses these needs with precise performance: spatial temperature deviation $\leq \pm 3^\circ\text{C}$ and temperature deviation $\leq \pm 0.5^\circ\text{C}$ over time at the maximum temperature of 500°C.

Air exchange is an important parameter in many test protocols. The air exchange rate of the oven can be adjusted by attaching flow restrictors to the damper - to reduce the opening.

The WU 6100 is delivered with two flow restrictors with different diameters. For achievable air flow rates see specifications in table on page 25.

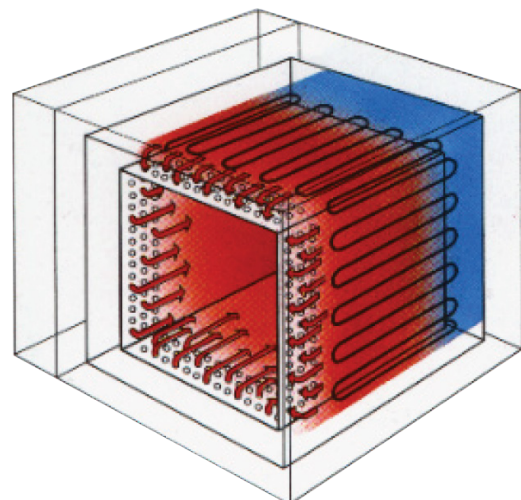


WU 6100

The air jacket principle

The WU 6100 is designed as a mechanical convection oven in order to maintain optimal temperature distribution, even when fresh air is admitted to the unit.

Efficient tubular heating elements in an air duct are laid like a jacket around five sides of the work space. The fresh air entering from outside is thoroughly mixed with the hot circulating air before the fan forces the mixture into the air duct to ensure uniform heat in the work space.



WU6100 oven product features

Fully Equipped

The standard WU 6100 model features the following equipment:

- Thermicon® P temperature controller with up to 9 steps and timer function
- Adjustable over-temperature protection in compliance with Class 2, DIN 12880
- Damper in the fresh air socket to regulate the air supply
- Two wire mesh shelves
- Exhaust socket with chimney

Versatile

Several choices are available to adapt WU6100 to user specific applications

- Eurotherm™ 2404/P4 programmable temperature controller with up to 16 steps and RS 232 interface
- Eurotherm™ 2404/P4 programmable temperature controller with up to 16 steps and RS 422/485 interface
- Provision for connection to an external temperature recorder. Additional NiCr-Ni thermocouple in the work space with recorder connection outlet
- Provision for connection to a central monitoring system, for ex. warning signal. this signal will be triggered if the overtemperature protection responds.
- Tubular leadthrough in the right side wall

Handy

- Compact overall dimensions
- Work space: 95 liters
- Inner casing of corrosion-resistant stainless steel

Safe and energy-efficient

High-grade, microporous insulating materials and fibres of aluminum silicate ensure

- Low energy consumption
- Low surface temperatures: no risk of getting burned - operator accessible areas do not reach more than 40 °C - even at rated temperature

Spatial temperature variation in accord. with DIN 12880 Part 2

Set temperature (°C)	Temperature variation with air circulation (°C)	Temperature variation with fresh air operation
100	$\leq \pm 1$	$\leq \pm 2$
200	$\leq \pm 1.5$	$\leq \pm 4$
300	$\leq \pm 2$	$\leq \pm 6$
400	$\leq \pm 3$	$\leq \pm 6.5$
500	$\leq \pm 3$	$\leq \pm 7$

Amount of fresh air m³/h

	100°C	300°C	500°C
Air flap open (fresh air)	18.6	17.3	14.6
Flow restrictor Ø 15mm	7.3	7.1	5.4
Flow restrictor Ø 10mm	2.7	2.7	2.6

Technical data

Specifications



Thermo Scientific air circulating heating oven WU 6100

Cat. No. 51005691

Dimensions

Outside dimensions (incl. door handle) (WxHxD)	895 x 840 x 905mm
Chimney Ø	40mm
Chamber volume	95 l
Chamber internal dimensions (WxHxD)	475 x 475 x 420mm

Weight

Empty weight	195 kg
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Temperature

Rated temperature	500 °C
Temperature deviation at 500 °C (spatial) ²⁾	approx. ±3 K
Temperature deviation at 500 °C (temporal) ²⁾	approx. ± 0.5 K
Warm-up time to nominal temperature	70 min

Shelves

Number of shelves (standard/maximum)	2/5
Dimensions (W x D)	465 x 365mm
Permissible load	15 ¹⁾ kg/shelf

Electrical data

Rated power (connected load)	5.4kW
Rated voltage	380V(AC)
Holding power at rated temperature	2.0kWh/h

Protection Category

Protection category in acc. with DIN 40 050 Part 1	IP20
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Warranty

Warranty	2 years (parts and labor)
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1) Max. Overall permissible load:45kg 2) in acc. with DIN 12 880 Part 2 at rated temperature * All quoted values are typical values measured for standard models and are subject to slight fluctuations.
Note: all values based on measurements according to DIN12880

Ordering information for WU6100

Product	Description	Cat. No.
Wire-mesh shelf	Additional stainless steel shelf	50034234
Tubular access port	Tubular leadthrough Ø 24mm in right side wall	50034607
Support frame	Support frame, height: 800 mm	50034246
Calibration certificate	Calibration certificate for 500°C at center of the work space (order with oven)	50044445
Calibration addtl.	Calibration at an additional measuring point - max. 2 (order with oven)	50044188
Factory installed options		
Control with RS232 interface	Eurotherm 2404/P4 with RS 232 interface	51900297
Control with RS422 interface	Eurotherm 2404/P4 with RS 422/485 interface	51900298
Socket external monitoring	NiCr-Ni sensor socket with a separate built-in thermocouple	51900182
Central monitoring	Central monitoring connection: Connection for max. 250 V/3 A	51900188

Heating and drying - custom solutions

Heratherm OGH TK Testing Ovens

The Heratherm™ OGH TK is a Temperature Testing Oven with gravity convection, without an air circulating fan. Based on the standard gravity convection ovens, these units have a special technical design. The oven is particularly suitable for aging tests of rubber. It has been developed and constructed in accordance with the standards of cables and insulated electrical leads.

The Temperature Testing Oven complies with the requirements of the following norms:

- DIN 12880: 2007
- EN 61010-1
- EN 61010-2-010

These requirements are getting fulfilled in a temperature range between 50 and 250 °C with 8 - 20 air exchanges per hour.

On demand the unit can also be delivered with capabilities of 3 - 10 air exchanges per hour, to comply with the requirements of standard DIN 60811-1-2 and the requirements of the relevant standards DIN 53508 and ISO 188.

The great temperature uniformity and stability of the TK ovens is due to an inner aluminum chamber, which is surrounded by the heated air for very uniform heat transfer.



Heratherm OGH TK 180 test oven



Interior of OGH TK 100 with aluminum ISO box

Specifications and ordering information

Technical specifications

	OGH TK 60	OGH TK 100	OGH TK 180
Weight (empty, kg)	ca. 48	ca. 60	ca. 80
Electrical data			
Rated Voltage / Frequency (Choices EU and USA)	230V; 50/60Hz 120V; 60Hz	230V; 50/60Hz 208/240V; 60Hz	230V; 50/60Hz 208/240V; 60Hz
Rated power (kW)	1.8	3.1	3.1
Temperature			
Temperature range	50 – 250 °C	50 – 250 °C	50 – 250 °C
Spatial temperature deviation at 50 °C	1,0 K (+ 0,5 K)	1,0 K (+ 0,5 K)	1,0 K (+ 0,5 K)
Spatial temperature deviation at 100 °C	2,0 K (+ 1,0 K)	2,0 K (+ 1,0 K)	2,0 K (+ 1,0 K)
Spatial temperature deviation at 150 °C	2,0 K (+ 1,0 K)	2,0 K (+ 1,0 K)	2,0 K (+ 1,0 K)
Spatial temperature deviation at 200 °C	3,0 K (+ 1,5 K)	3,0 K (+ 1,5 K)	3,0 K (+ 1,5 K)
Spatial temperature deviation at 250 °C	3,0 K (+ 1,5 K)	3,0 K (+ 1,5 K)	3,0 K (+ 1,5 K)
Temperature deviation over time at 150 °C	< 0,3 K	< 0,3 K	< 0,3 K
Dimensions			
Volume of Testing Space (ISO-Box)	47 l	74 l	132 l
Dimensions of Testing Space (ISO-Box) W x H x D (mm)	294 x 400 x 348mm	404 x 520 x 351mm	404 x 600 x 526mm

Note: all values based on measurements according to DIN12880 Warranty: 2 years (parts and labor)

Please note: the Heratherm OGH TK oven models are custom built, and do not have a catalogue number. Please contact your Thermo Scientific sales representative to place an order.



UT 6050 Test Ovens with mechanical convection

UT 6050 series ovens are laboratory devices for thermal technology applications.

These devices allow for a very precise temperature control.

They are designed for heat treating samples or materials at operating temperatures between 50°C and 250°C (UT 6050 LA 300°C), including - for example, drying, ageing, analyzing, decomposing, burn-in, oxidizing, reducing, and preheating.

UT 6050 series ovens have been designed for installation and operation in the following fields of application:

- Heat treatment under reduced or modified atmospheric conditions
- Drying of material
- Use only non-flammable and non-poisonous gases.

Besides the precise temperature performance, the ovens provide defined air exchange rates, which are required in a variety of standards and norms.

Several models with different specifications are available:

- UT 6050 N / UT 6050 K: 8-20 air exchanges per hour at 70 - 250 °C

These ovens address the requirement of air changes

in some European and other testing standards, e.g. for cable and rubber testing. Model N includes variable fan speed and air flap adjustment for high flexibility.

- UT 6050 ASTM: 100-200 air exchanges per hour at 70 - 250°C. The air exchange rates of this oven are relevant for some North American testing standards.
- The UT 6050 LA has similar specs, but with 20 air exchanges, and extended temperature range - up to 300°C.
- UT 6050 HS: 8-20 air exchanges per hour at 70 - 250 °C . Additional features include adjustable fan speed, a viewing window. The oven has been fitted with the appropriate electrical systems to allow laser measuring equipment to be installed.

A factory calibration certificate for air replenishment and temperature accuracy is provided with each oven as confirmation of compliance with the specified data (except for the base model UT 6050 N).

Note that there are modifications available with variations of the specs, individual access ports, or viewing window.

Based on your application specification our specialists will support in defining the best solution for you.



UT6050K



UT6050K with viewing window

Specifications and ordering

Technical specifications

	UT6050 N / K	UT 6050 ASTM (LA)	UT 6050 HS
Weight (empty, kg)	80	80	80
Electrical data			
Rated voltage (V)	230	230	230
Rated frequency (Hz)	50/60	50/60	50/60
Rated current (A)	14.4	14.4	14.4
Rated output (kW)	3.1	3.1	3.1
Degree of protection	IP 20	IP 20	IP 20
Protection class	I	I	I
Overvoltage category as per IEC 60364-4-443	II	II	II
Air exchanges per hour			
250 °C	8-20 h	8-20 (20) h	8-20 h
Max. fresh-air flow rate			
250 °C	2.4 m³/h	2.4 m³/h	2.4 m³/h
Temperature			
Temperature range	50 – 250 °C	50 – 250 °C (300°C)	50 – 250 °C
Temperature deviation, spatial at 150 °C	+/- 1.6 K	+/- 1.6 K	+/- 1.6 K
Temperature deviation, spatial at 250 °C	+/- 3.9 K	+/- 3.9 K	+/- 3.9 K
Temperature deviation over time (at 250 °C)	< +/- 0.5 K	< +/- 0.5 K	< +/- 0.5 K
Dimensions			
Exterior housing, with feet (W x H x D)	790 x 700 x 800 mm	805 x 715 x 800 mm	790 x 730 x 715 mm
Outside diameter of supply/exhaust air nozzles	40/100 (40 w/o adapter)		40/100 (40 w/o adapter)
Inner chamber vapor area VD(L)	120	120	120
Inner chamber interior VI(l)	105	105	105
Shelves			
Number of trays, standard/maximum	2/9	2/9	2/9
Size of trays (W x D)	448 / 404 mm	448 / 404 mm	448 / 404 mm
Loading capacity per shelf (kg)	10	10	10
Maximum loading of the system (kg)	50	50	50

Note: all values based on measurements according to DIN12880 Warranty: 2 years (parts and labor)

Please note: the UT6050 oven models are custom built, and do not have a catalogue number. Please contact your Thermo Scientific sales representative to place an order.

Other special drying and heating applications

Customized heating and drying ovens

For customer specific needs in heating and drying, Thermo Scientific offers modifications of the existing standard ovens and vacuum ovens, specifically the Heratherm and Vacutherm product lines. The TK ovens (see page 27) are one example of such a modification.

The modifications can address various requirements, including performance, or specific features or capabilities. Please contact your local sales representative or product specialist of Thermo Scientific. Based on a structured request, our custom specialist will evaluate and make suggestions for a custom solution. Please note that any customisation has to be based on an existing oven, so basic size and performance is given.

Examples of modifications:

Custom access ports: Standard access ports provided in most of our ovens can cover the majority of needs - e.g. for independent temperature logging. However, we can address specific locations or multiple ports to address unique needs in a heating or drying application.



We can implement modifications on our Heratherm and Vacutherm ovens

Custom modification options

For industry-type settings our specialist can make suggestions in regards to:

- Sturdy door handle - to address heavy and forceful door openings and closures
- Electromagnetic or key-lockable door - to address process control and safety
- Reinforced chamber / shelving for heavy loads,
- Specific alarm outputs (e.g. signal tower),
- Door with viewing window for sample inspection
- Sophisticated temperature controller for enhanced programmability
- Additional over-temperature protection devices (e.g. class 2 or 3 compliance)
- Data logging interfaces

Some applications require particle-reduction, e.g. for use in a cleanroom environment. Our custom specialists can offer solutions with some special treatment to the insulation material and additional filters to reduce particle output of the oven.

Inert gas is sometimes used in (non-flammable) heating or drying applications to reduce oxidation processes. Possible modifications of our standard ovens include a gastight chamber with inert gas connection to reduce oxidation processes. Additions like flowmeter for the gas can be included.

Even though the standard offering includes programmable controls for extensive temperature ramping, some protocols might ask for more complex automated capabilities, e.g. programs with more steps, or more programs to save, or additional capabilities - e.g. pressure control for vacuum oven.

When working under vacuum, some special applications might require secondary vacuum levels, or additional monitoring capabilities.

These are just some examples, our team can address changes to cover many other requirements that you might have.



OMH400 with three viewing windows



OMH180 oven with electromagnetic door lock and tower light for batch processes



Sturdy industrial handle

Custom modification options cont.

Please contact your Thermo representative or product specialist, who will collect your detailed requirements and specifications. Our custom specialists will then review your requests, and evaluate if they can offer a modification. A customisation requires development and construction work, as well as interaction with production and suppliers. Therefore be aware that implementation will take much longer than ordering a standard “off the shelf” product.

Please make sure to choose the underlying standard oven for a modification before discussing your request with your Thermo representative or product specialist.



Particle reduced oven OMH PP 100 front



Particle reduced oven OMH PP 100 back

Find out more at thermofisher.com/ovens

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