



DYCOMETAL

Testing Technology



Testing Technology

DYCOMETAL

Mr. Angel Padilla Dopazo

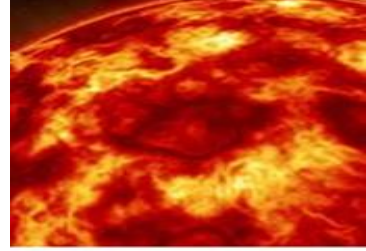
15/03/2024

www.dycometal.com

Copyright © Dycometal . All rights

AFA SERIES – FORCED AIR HEATING OVENS

FORCED AIR HEATING OVENS, AFA- SERIES



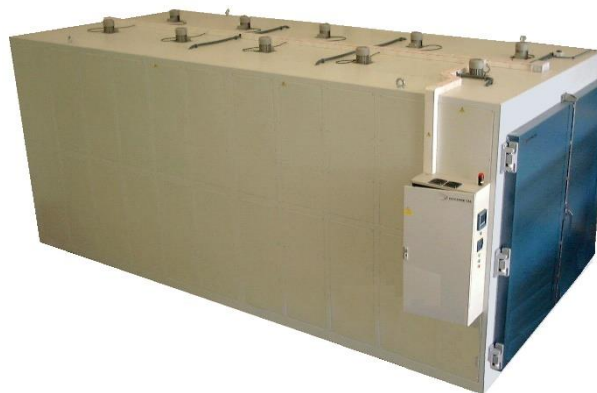


Within environmental testing, **forced air circulation ovens** are used for the conditioning of samples at a given temperature, drying or ageing of samples.

Their working temperature ranges from room temperature +10 °C (+40 °C approx) up to 300°C or 400°C and their volumes can range from the smallest size up to 3000 litres.

Standards such as: **DIN 12 880, DIN 40046, DIN 58 945, IEC 68-2-2, MIL-STD 810D, MIL-STD 883, MIL-STD 883C**, etc., usually use this type of equipment.

The volumes of this equipment will depend on the size of the parts to be tested, as well as the number of parts to be tested. Constructively, ovens from 80 to the largest furnaces of 36 m3 can be manufactured.



How to define an oven?

In order to define a chamber, it is necessary to know several important points:

1. Type of sample/s. It is important to know the type of samples to be tested, since the furnaces work at high temperatures and many of the tests requested may be on samples that can generate volatile or explosive components.
2. Size of sample/s to be tested and number of samples to be tested. This point is important to define the minimum size of the oven. Knowing the size of the samples and the number of samples to be tested in parallel allows us to offer the most appropriate oven volume.
3. Standards to be tested. It is very important to know the standards that the client wants to use in the oven, because these standards will indicate if the oven must have any additional element.





DYCOMETAL offers a range of small and large volumes in its standard configuration of forced air heating ovens. We also could manufacture ovens for a bigger volumes.

MODELS		AFA-200/	80	150	288	490	525	768	1000	1500	2000	3000
Volume		Liter	80	150	288	490	525	768	1000	1500	2000	3000
Internal dimensions	Height	mm	500	600	800	1000	500	1200	1000	1500	1500	1500
	Width	mm	400	500	600	700	1500	800	1000	1000	1300	2000
	Depth	mm	400	500	600	700	700	800	1000	1000	1000	1000
External dimensions	Height	mm	980	838	1040	1250	700	1500	1250	1800	1800	1800
	Width	mm	640	1030	1145	1250	1900	1400	1600	1600	1600	2300
	Depth	mm	570	640	720	900	1000	1000	1210	1210	1400	1400
Thermal test												
Minimum temperature		°C	Room +10									
Higher temperature		°C	+100 / +150 / +200 / +250 / +300 / +350 / +400									
Temperature change rate, heating (acc. IEC 60068-3-5)		°C/min	2									
Stability		°C	±0,1 °C α ±0,3°C									
unifromity		°C	±1 °C to ±2% of the measure									
Other features												
Weight		Kg	90	142	195	230	275	280	360	440	550	650
Power		V	400V 3П~PE									

AFA – XXXX *e* T



**FORCED AIR
HEATING OVEN**



VOLUME



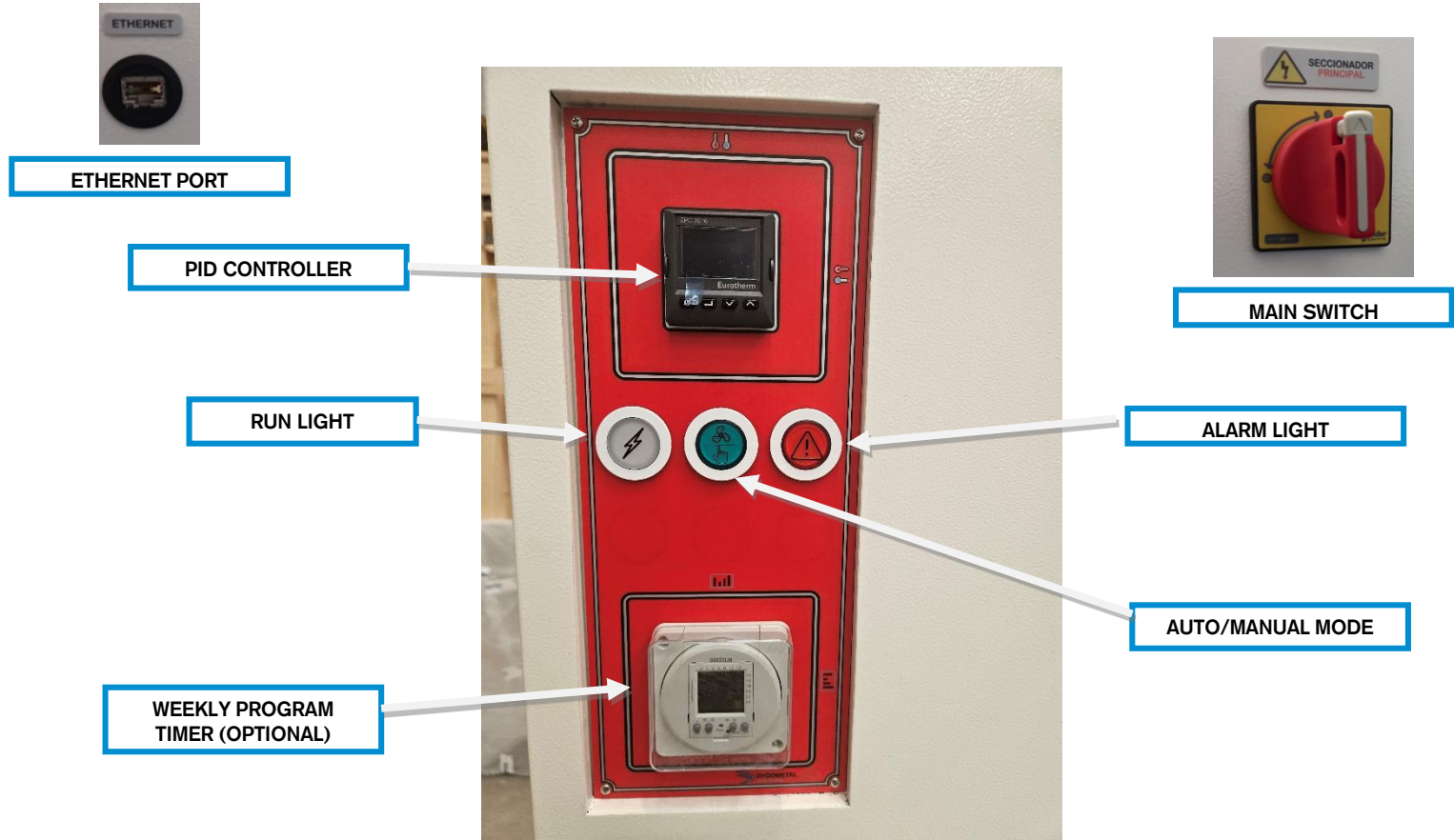
SPECIAL

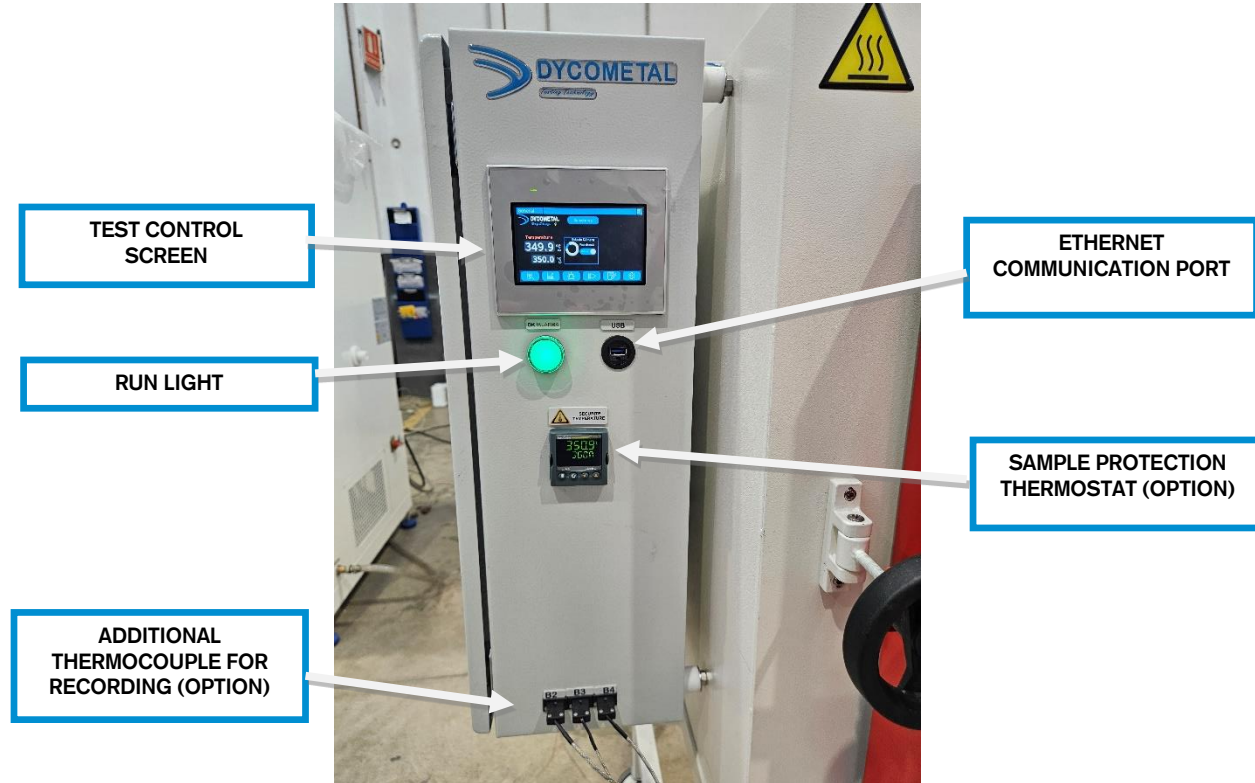


**TOUCH SCREEN
CONTROLLER**

- Interior made in Stainless steel AISI304.
- Exterior made in painted steel.
- 2 stainless steel shelves (max. load 30 kg).
- Mechanical pressure seal to ensure the tightness of the door.
- Inner silicone gasket for greater tightness.
- Access port of 25 mm Ø made in steel.
- PID Eurotherm controller.
- Pt-100 DIN Class A, control sensor.
- Ethernet communication port
- iTools for recording the test values in an external PC.
- Mechanical safety thermostat.
- Height adjustable legs (Casters like option).









SUPPORT TABLE

Support table manufactured in tube of steel and painted with epoxy paint according with RAL – 9010, (same color than the oven). This option gives to the oven an ergonomic position.

Height of the table: 700 mm.

The structure can be manufactured with a solid shelf under the oven.

Models: AFA-.../80, AFA-.../150, AFA-.../288, AFA-.../490 and AFA-.../525.



SUPPORT TABLE WITH CASTERS

Support table manufactured in tube of steel and painted with epoxy paint according with RAL – 9010, (same color than the oven). This option gives to the oven an ergonomic position.

The table comes with 4 wheels, 2 with brakes and 2 without them.

The wheels give mobility to the oven.

Height of the table: 700 mm.

The structure can be manufactured with a solid shelf under the oven.

Models: AFA-.../80, AFA-.../150, AFA-.../288, AFA-.../490 and AFA-.../525.



RAILS ON FLOOR

Rail system embedded in the isolated floor to be able to introduce heavy samples or carts.



OVENS WITHOUT FLOOR

When the samples are very heavy or the number of samples are high, the oven is constructed without floor. This option will depend on the temperature of the test.



ADDITIONAL SHELVES

The ovens are supplied with two trays as standard, but the number of shelves to be positioned inside the stove can be expanded depending on the model selected.

Standard shelves can have a maximum weight of 30 kg.

We also have **reinforced** shelves with load capacity depending on the weight of the sample/s.



OBSERVATION WINDOW

Safety glass made in pyrex. Dimensions 200 x 200 mm.
 The interior light is not included in this accessory, is offering separately. NOTE, the glass could be a focus of thermal lost.

INTERIOR LIGHT

Interior lamps installed in the roof of the workspace with IP65 encapsulation. Light on/ off button placed in the control panel.

ACCESS PORT

Made of stainless steel with cap in order to introduce the electrical cables, thermocouple or thermometers.
 Different diameters: 25, 80, 100, 200 mm- Ø





ELECTROMAGNETIC LOCK

Security lock, for door lock. Door opening depending on a certain temperature value. The system comes with key to unlock the door in case of power loss.



EXTRACTION TURBINE

Extraction system with several applications: remove of the gases produced during the test, cycling, remove the internal heat of the oven quickly to open the door or extraction of the humidity produced by the samples.

The extracted air must be taken to a safety place to avoid material or personal injury.



LOW LOAD HEATERS

Safety resistors installed in place of the standard resistors, when the sample to be analysed could be explosive or the atmosphere could be flammable.





SURFACE TEMPERATURE LIMITER

Safety system to control the surface temperature of the heating elements, preventing overtemperature on the surface of the heating elements which may cause explosions when reaching the flammable point of the gases or vapours. Thermocouples shall be attached to the surface of the heater and monitor its temperature.

Each heater shall have its own surface monitoring probe.



GALVANIC BARRIERS

For sensors. Intrinsic safety system to prevent ignition of escaping flammable gases by preventing the generation or storage of sufficient energy, and by limiting the energy supplied to it.



OVERPRESSURE RELIEF

Safety system using a vent or pressure relief panel designed to help reduce the risk of damage to the test chamber following a rupture of the battery or a build-up of internal pressure due to a deflagration of gases.





CONTROL AND DATA RECORDER UNIT

Paperless recorder for measuring and independent regulation of temperature and humidity, located on the front of the control. This option includes one Ethernet communication port and control software iTools. NANODAC, could be used like controller/data record unit.



SAMPLE PROTECTION THERMOSTAT

Overheating safety level digital limiter with independent sensor Pt-100, to avoid the damage of the samples by the high temperatures. The limiter will stop the oven when the temperature increases of the indicated limit.



WEEKLY PROGRAM TIMER

Its function is set a time determined the team and will stop the system of heating a time elapsed that time. At the same time, an acoustic alarm will sound to warn of the end of the time of heating.



TOUCH SCREEN

4.3" or 7" touch control screen (to be selected), for easy and intuitive control of the oven. The HMI allows the visualization of test profiles, data storage, as well as data extraction via USB port..



FAN SPEED VARIATOR

Adjustable fan speed for have a better airflow control.
 From 50% to 100%.



MICRO SWITCH

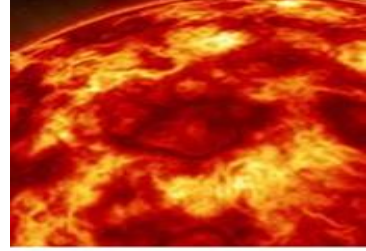
Security element to stop the fans when the test is running and the door is opened.



FREE POTENTIAL OUTPUTS

Outputs by contacts free of potential, is associated to events normally and is used to give signals to the client when need to activate a load, in a segment of the program that is running.

AFA- SERIES SPECIAL SYSTEMS



EXTERNAL CONDITIONING UNIT

External conditioning units or generators are independent and movable units which allow acclimatisation of external enclosures under temperature conditions by connecting insulated hoses which supply air to an insulated enclosure positioned at a distance.

For testing of heat conditioning in inaccessible samples. The oven have associated an external workspace that allow conditioning this particular area of the piece.

Tests box is manufactured adapted to the system to be tested.

This construction come with houses for the circulation of the air.



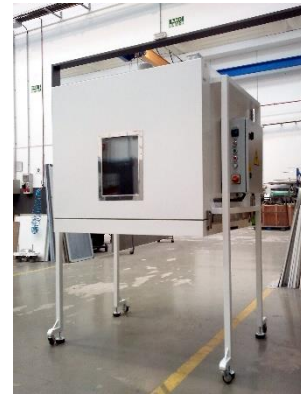


EXTERNAL CONDITIONING UNIT

OUR designs are completely flexible, being able to adapt to the client's needs in terms of interior and exterior dimensions and temperature ranges.



AFA 250/176 By DYCOMETAL (2014)



EXTERNAL CONDITIONING UNIT

The equipment is made up of 3 distinct parts:

- A climatic or thermal conditioning unit, which will control the temperature and/or humidity. This unit shall have the cooling unit, heating elements, control panel and all the technical parts for environmental control. It shall also have a temperature and/or humidity sensor to be placed in the external test enclosure.
- Supply and absorption hoses, for the movement of air to and from the climatic or thermal unit. Rigid or flexible insulated ducts, allowing the movement of conditioned air from the conditioning unit to the test enclosure.
- An insulated test enclosure, constructed according to the customer's requirements. The test enclosure is the area where the samples to be tested will be placed and where the climatic test conditions of both temperature and humidity will be reached. .





Dycometal has designed and developed thermal test chambers for any type of universal testing machine, for the climatic conditioning of samples during the tensile test.

These chambers are designed to allow jaws to be inserted into the chamber during the test.

Workspace is introduced between the columns of the universal test machine. The distance between both columns is important to know the free space and the dimensions of the oven.

Its construction depends on the type of universal machine where will test the samples.

Ovens can come with a structure, adjustable in height, automatically or manually, to allow the adjusting the height of the equipment.



The oven is configured to adapt to any kind of shaker, electrodynamic or hydraulic.

Oven can be constructed for different degrees of freedom, and the conditions of the test may vary: temperature, high temperature gradients,...

Even the external design of the oven may vary, depending on the requirements of the Customer. The oven can modify the workspace dimensions, doors, access ports, etc.



When the samples are large and heavy, or the client wants to test a large number of samples, the solution offered is a modular solution (**WALK-IN**).

The construction of the ovens will depend on the upper temperature range, and may be welded (temperature ranges higher than +85°C) or panelable (when the highest test temperature is +80°C).







DYCOMETAL

Testing Technology

Testing Technology