



**memmert**  
Experts in Thermostatics

# Best quality for unrivalled taste

Temperature control appliances for the food, beverage and tobacco industry

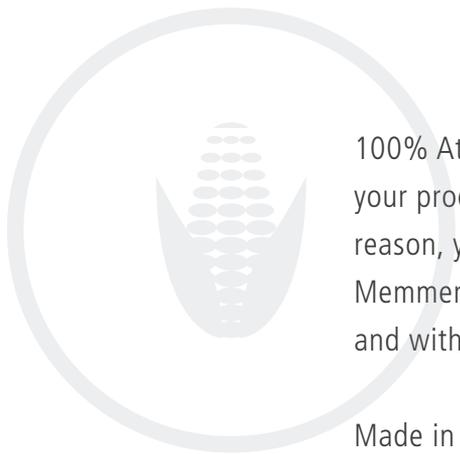


100% ATMOSAFE. MADE IN GERMANY.

[www.memmert.com](http://www.memmert.com) | [www.atmosafe.net](http://www.atmosafe.net)



# Reliability. Precision. Passion.



100% AtmoSAFE. Trust is created by quality assurance. This applies to your products as well as to our temperature control appliances. For this reason, you can rely on the fact that, within the entire interior of a Memmert incubator, your microbiological cultures are incubated gently and without any temperature overshoots.

Made in Germany. Quality is created by careful selection of ingredients. That's why we manufacture all components which are vital for the precise temperature control of our incubators, ovens and climate chambers ourselves.

Sustainability and durability. Your requirements determine our operating panels, functional scope and accessories. For this reason, many of our temperature control appliances are kept in operation, reliably and precisely for decades, worldwide.

Our passion for detail determines the outstanding quality of our temperature control appliances and has made us leader in technology. 100% AtmoSAFE is our promise to you to guarantee a perfect atmosphere in all our appliances. What can we do for you?

Incubator  
**Microbiology**

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Steriliser  
**Microbiology**

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Cooled incubator  
**Microbiology, stability**

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Universal oven  
**Ageing, drying, conditioning**

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Cleanroom drying oven  
**Ageing, drying, conditioning**

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Waterbath  
**Sample temperature control**

Temperature

Climate chamber  
**Microbiology, stability testing according to ICH**

Temperature Humidity CO<sub>2</sub>



Constant climate chamber  
**Climate testing, stability, conditioning**

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Climate chamber  
**Stability testing according to ICH, conditioning**

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Humidity chamber  
**Stability, conditioning**

Temperature Humidity



Temperature Humidity Light

Constant climate chamber  
**Plant cultivation**

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Constant climate chamber  
**Stability**

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Climate chamber  
**Stability testing according to ICH**

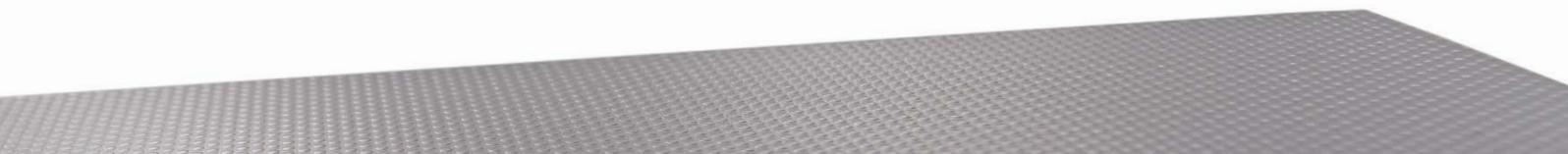


Temperature Vacuum

Vacuum oven  
**Drying**

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Cooled vacuum oven  
**Low-temperature drying, atmosphere simulation**





## INCUBATOR I

32 to 749 litres  
+30 °C to +80 °C  
Natural convection or  
forced air circulation

The heating and temperature control in the incubator I were designed specifically for low temperatures from +30 °C to +80 °C. You can be certain that your organic chamber load is incubated most gently and without any temperature overshoots. During the heating process, temperature is increased within a very narrow control range and kept exactly at the target value. A pre-heating chamber heats up the supplied air, so that no temperature deviations can occur in operation. The chamber of the INplus and IFplus models can be sterilised at +160 °C in a 4-hour programme, including all installations.

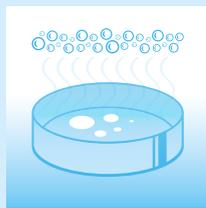
### POSSIBLE APPLICATIONS

Microbiological tests  
Germ count determination  
Incubating cell cultures  
Ageing/heated storage

## Application I and S: A Memmert trio in the beer laboratory

The "Bavarian Purity Law" and the brewery's commitment for the highest possible quality of beer forbid pasteurisation or adding preservatives in brewing the Schönram beers, awarded the 'World Beer Cup' several times. Thus, a brewmaster has to have excellent knowledge of microbiology, since, over the entire production process, samples of beer are subjected to a continuous screening for beer-spoiling microorganisms. In the laboratory of the Schönram brewery, an incubator INE550 and a hot air steriliser SFE550 made by Memmert are almost permanently in use. In the incubator, the bacteria are incubated at +27 °C for six to seven days. The brewmaster particularly values the durability and exact temperature control of his INE appliance, as well as its high-quality processing and ease of cleaning. Directly below the incubator, there's a hot air steriliser, since reliable laboratory results are only possible if sample bottles, gas filters, Ringer's solution and water are sterilised residue-free. A waterbath for heating the culture media completes the Memmert trio in the Schönram beer laboratory.

Private Landbrauerei



### We know how:

As little air circulation as possible in the incubator

The less forced air circulation, the better. Why? Thanks to a protective layer of humid air that forms over the moisture containing samples, the bacteria cultures cannot dry out. If air circulation is applied, this air layer is destroyed and the warm air replacing it further withdraws humidity.

Homogeneity measurements at 27 points in Memmert incubators demonstrate that, thanks to a perfect interaction of all-round heating and temperature control, air circulation is in most cases unnecessary. Even in an appliance with 749 litres chamber volume, the maximum deviation at natural convection at +37 °C never exceeds  $\pm 0.7$  K in the entire temperature range. Provided the chamber is fully loaded and forced air circulation is required, it can be precisely adjusted (0 - 100 % in steps of 10 %). By the way, all Memmert incubators comply with the strict requirements of DIN 12880:2007-05!



## STERILISER S

32 to 749 litres

+30 °C to +250 °C

Natural convection or  
forced air circulation

In laboratories of the food industry, proper hygiene is the top priority. In order not to take any chances when it comes to cleaning laboratory glass, it is recommended to supplement the use of the laboratory dish washer with hot air sterilisation. The setpoint-dependent programme resume function SetpointWAIT of the Memmert hot air steriliser guarantees precise sterilisation times and the complete elimination of even the most resistant microorganisms. Thus, sterilisation time does not start before the desired setpoint temperature has been reached. Laboratory accessories made of glass or metal are perfectly suitable for sterilisation in the hot air steriliser S.

If you want to find out more about the advantages of the appliances from Memmert, we recommend our technology overview "10 good reasons for a Memmert".

Just send an email to [sales@memmert.com](mailto:sales@memmert.com), and specify which Memmert appliance you are interested in and we will send you the corresponding brochure.

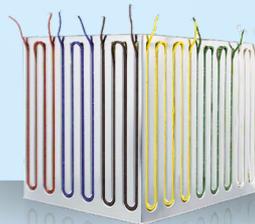
### We know how:

#### Precision and optimum temperature distribution

The smaller the heating elements in an oven, the more they must be heated up to reach the required temperature in the interior. A standard ring heater with an overall heating element length of one metre will even start to glow, making a gentle and accurate adjustment considerably more difficult to achieve.

A Memmert heating oven with a volume of 749 litres is surrounded on all sides by 52 metres of heating elements. Six heating circuits are controlled separately from one another, so that the required temperature is exactly obtained and maintained at every point in the interior – linearly and without fluctuations. In a Memmert drying oven, the heating doesn't simply switch off when the set temperature has been reached. Temperature is controlled permanently, gently and evenly throughout the entire chamber.

The logical consequence of this unique system:  
Excellent values for temperature homogeneity and temperature stability.





## COMPRESSOR-COOLED INCUBATOR ICPeco

256 | 449 | 749 litres  
-12 °C to +60 °C

The environmentally-friendly compressor-cooled incubator ICPeco is cooled with climate-neutral CO<sub>2</sub>. Thanks to the excellent thermodynamic properties of the CO<sub>2</sub> (R744) refrigerant and the finely adjusted control technology, the ICPeco is both powerful and efficient.

If a large number of samples have to be permanently incubated, you can rely on the maximum utilisation of the chamber. After all, of what use is a large chamber if some levels cannot be used after validation? Without critical temperature overshoots and energy-intensive re-adjustments, the ICPeco keeps the temperatures exactly at the setpoint, including when switching quickly between heating up and cooling down phases.



### We know how:

#### Incubation without a rise in room temperature

A situation known in a lot of laboratories: Several cooled incubators stand side by side, and the more cooling power they have, the more the air is heated. This starts a vicious circle, since the cooled incubators have to cool more and more to compensate this, which is, of course, very energy-intensive. In case of very low operating temperatures, the incoming cooled air always condenses and freezes at the coldest point in the chamber.

With incubators which are not cooled, the combination of incubation temperatures above +30 °C and similar room temperatures might under certain circumstances lead to a failure of the appliance. Do you want reliable incubation without a rise in the room temperature in your laboratory due to waste heat of your appliances while at the same time looking out for the environment? Then talk to your Memmert contact about the use of a cooled storage incubator IPS or a cooled incubator IPP based on Peltier technology. Due to the combined heating/cooling concept, Memmert Peltier appliances offer reliable and precisely controlled cooling operation, only emitting the same amount of energy to their surroundings as they extract from the chamber.

### POSSIBLE APPLICATIONS

- .....
- Microbiological tests
- .....
- Germ count determination
- .....
- Incubating cell cultures
- .....
- Cultivation below and above room temperature
- .....
- BSB5 and BSB7 determination





## Application IPP and U: Accelerated testing of soya drinks and soya desserts

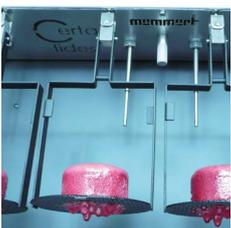
In food containing a lot of water and proteins, such as milk and soya drinks, germs are easily accumulated, especially when not refrigerated. Therefore, Alpro soya drinks and desserts are ultra heat treated in Europe's largest and most modern production plant for soya food in accordance with the principle of UHT treatment before sterile filling. During this ultra heat treatment, the products are sterilised for a short time at a temperature of more than +135 °C. To take no chances, the products of course undergo accelerated testing before delivery. In a Memmert universal oven, samples from the production are exposed to high temperatures from +30 °C to +55 °C. After 3 and 5 days, the pH value is determined and the products are tested for germs and fungal spores in various analyses. The refrigerated Alpro products are also thoroughly tested in ISO standard durability tests before delivery. In the Wevelgem laboratory in Belgium, the samples, which are inoculated on a Petri dish, are incubated at +25 °C in a Memmert cooled incubator IPP400. After 3 or 4 days, the pH value is determined and the samples undergo a microbiological analysis.

## Application IPP and HPP: Ice cream melting behaviour



The perfect ice cream has a creamy consistency without water crystals and melts smoothly and slowly. Thanks to the Meltdown Analyzer TC 1, which the Swiss company Certa Fides GmbH made ready for industrial series production in cooperation with Memmert, ice cream manufacturers can exactly analyse and document the melting behaviour of their different ice cream flavours.

The Certa Fides Meltdown Analyzer TC 1, based on the Memmert cooled incubator IPP or constant climate chamber HPP, enables standardised measurements of ice cream samples and other foamed food to be performed during meltdown at defined temperatures. Key requirements are sensitive, uniform and fluctuation-free temperature control as well as avoiding mechanical impacts with a compressor while maintaining the same homogeneous conditions for all samples. The control electronics was developed by Memmert, with Certa Fides providing the application-specific components like weighing cells, cameras and illumination units as well as comprehensive measuring and evaluation software.



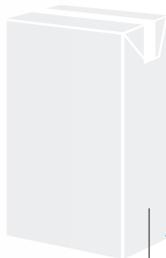
## PELTIER-COOLED INCUBATOR IPP

32 | 53 | 108 | 256 | 384 |  
749 | 1060 litres  
0 °C to +70 °C

Excellent controllability, extremely small control fluctuations, low-vibration operation and impressive energy savings provide the added value from the Peltier technology in the Memmert cooled incubators of the IPP series. In modern food analytics and in microbiological laboratories, tests and processes must be repeatable and documentable under precisely defined conditions. The Memmert IPP Peltier-cooled incubators operate at high precision, without vibration and in addition provide unparalleled energy efficiency, as, in contrast to compressor technology, energy is only used during the heating or cooling process. The advantages: The risk of the sample drying out is minimal, condensation formation during the cooling down process does not take place in the chamber, but on the Peltier elements. As the cooled incubator IPP does not need a compressor, it saves valuable space in the laboratory.

### POSSIBLE APPLICATIONS

- ..... Microbiological tests
- ..... Germ count determination
- ..... Incubating cell cultures
- ..... Cultivation below and above room temperature
- ..... BSB5 and BSB7 determination



**HOFFMANN NEOPAC**  
TINS AND TUBES

### Application HPP: Climate testing of packaging for food or tobacco

Hoffmann – The Tin. The metal tins, manufactured by the traditional company Hoffmann Neopac in Switzerland, which have received numerous awards, are unique, well-designed and robust. It goes without saying that the tins meet the high hygiene and aesthetic requirements placed on packaging for food and tobacco. In order to simulate various storing and shipping scenarios, the quality laboratory regularly tests the packaging in a Memmert constant climate chamber HPP108 and benefits in particular from the comfortable ramp programming of temperature-humidity combinations with the software. Before each test on corrosion, discoloration or changes in the coating layers, the testing parameters are set individually. Temperature-humidity combinations of 40 °C / 80 % rh in rotation with 25 °C / 40 % rh are common. Depending on the requirements, the tests are conducted in constant climate and / or alternating climate (based on climate testing in accordance with DIN EN ISO 6270-2) and can take from one day to several months.

## CONSTANT CLIMATE CHAMBER HPP



108 | 256 | 384 | 749 |

1060 | 1360 litres

0 °C to +70 °C (HPP110 to HPP1060)

+15 °C to +60 °C (HPP1400)

Humidity 10 to 90 % rh

(HPP110 to HPP1060)

10 to 80 % rh (HPP1400)

Climate chambers must work reliably and without interruption because a breakdown not only means that the employees cannot enjoy their leisure time but in some cases could threaten an experiment running over months. The Peltier technology of the Memmert HPP constant climate chamber works reliably over many years, enables absolutely precise temperature regulation and requires, in contrast to compressor equipment, no maintenance work at all, such as the replacement of coolant. Since, once the set temperatures have been reached, the efficiency of Peltier appliances is considerably better than that of conventional climate chambers and since Peltier appliances are considerably more eco-friendly in their production, the HPP makes a significant contribution to improving the climate balance.

Light module for HPP110, HPP260, HPP400 und HPP750 available as option.

### POSSIBLE APPLICATIONS

Storage and stability testing in constant climate

Plant cultivation

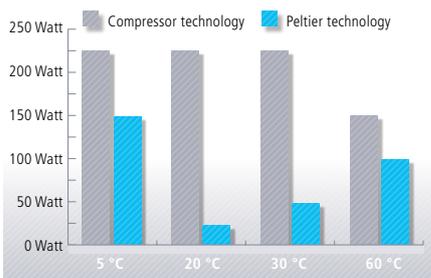
### We know how:

#### Saving energy in the laboratory

The topic of energy efficiency has been under discussion in the food, beverage and tobacco industry for some time now. Energy-saving temperature control appliances cut operating costs and are an integral aspect of environmental certification and management. Of course, all Memmert appliances featuring conventional heating elements or compressor cooling are designed to reduce energy consumption to a minimum, thanks to insulating materials, finely-adjusted electronic temperature control systems and large-area all-round heating. However, in order to actually create exemplary energy savers, innovative ideas like using Peltier technology are required.

In contrast to compressor technology, Peltier technology works in a particularly economical and energy-saving manner at temperatures close to the ambient temperature, since energy is only required if heating or cooling is needed. Therefore, very fine adjustments can be made to the heating or cooling functions.

#### Compressor technology vs Peltier technology



Up to 90 % less energy consumption at 22 °C ambient temperature



## CLIMATE CHAMBER ICHeco



256 | 749 litres

-10 °C to +60 °C

Humidity 10 to 80 % rh

The ICHeco for the stability testing of pharmaceuticals, cosmetics or foodstuffs is the environmentally-friendly future of compressor-cooled climate chambers foretold. It works with climate-neutral CO<sub>2</sub> (R744) as its refrigerant. Furthermore, it scores with its unique uniformity of temperature and humidity. Thermal transfer to the interior – heat and cold – is guaranteed through a large-area air jacket on four sides. Because this is hermetically sealed, the ICHeco consumes no more water once the setpoints have been reached, as long as the door is kept closed.

The ICHeco L model features an illumination unit with cold white light and UV radiation (standard illuminant D65).

The model ICH C combines temperature, humidity and digital CO<sub>2</sub> control.



### Application ICH: Shelf life test of gelatine



Gelatine is omnipresent. Who hasn't enjoyed a gummy bear or taken medicine in a gel capsule in their life? The company Rousselot, which was founded in France in 1891, can definitely be called a gelatine pioneer. The world market leader for gelatine and collagens draws on more than 120 years of experience in the development of new recipes and functions for the food and pharmaceutical industry. It goes without saying that the products meet the strict regulations of FAO, WHO, EP, USP or JP, not least because of the quality control that comprises all processes. Quality and reliability are the key words when it comes to the question of why Rousselot has been using Memmert appliances in Buenos Aires for many years. One of the latest acquisitions was a Memmert climate chamber ICH, in which products are stored for several months at constant and strictly controlled temperature and humidity parameters to test their durability.

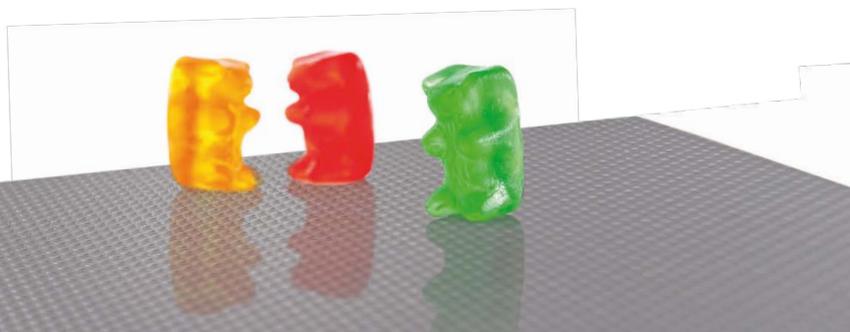
#### POSSIBLE APPLICATIONS

Storage in constant climate

Stability test, conditioning, ageing

Test for photostability of plastic containers and food containing dye and vitamins

CO<sub>2</sub> incubation, testing/storage in a controlled carbon dioxide atmosphere





## UNIVERSAL OVEN U

32 to 1060 litres  
 +30 °C to +300 °C  
 Natural convection or  
 forced air circulation

The success story of Memmert began in the year 1947, with the development of a hot air steriliser for the Red Cross. Today, Memmert heating and drying ovens are an essential part of quality assurance and manufacturing. Since the company's establishment, an uncompromising philosophy of quality has gone into every new development. Aesthetics and design coupled with unparalleled precision and reliability: corrosion-resistant, easy-to-clean stainless steel in the interior and outside, large-area all-round heating, device-specific interaction of heating and control.

### POSSIBLE APPLICATIONS

- Ageing/heating, for example of dairy products (accelerated test)
- Determination of dry content/humidity content
- Thermogravimetric determination of water absorption of residues in fluids
- Drying and heating of food samples, extracts and concentrates
- Temperature control of plates, breeding media and emulsions
- Migration tests, heat resistance tests



### We know how:

#### Drying of powder and granulate

If vacuum ovens are applied to dry large amounts of powder and granulate, the occurring volume expansion of the heated atmosphere in the interior sets a physically defined end to the capability of the vacuum pump to transfer humidity. The result: Heat transfer and steam removal come out of balance and the samples dry extremely slow or even simmer in their own juice.

Just opening the door of the vacuum oven to ventilate the interior would be the worst possible solution of this problem. For this reason, Memmert as the first manufacturer worldwide has developed a turbo-drying system with vacuum cycles for its vacuum oven VO. Thanks to this ramp programming, two vacuum values can be set between which the pressure in the interior is adjusted and digitally controlled. The advantages are obvious: Large amounts of dry air, which absorbs humidity, can be admitted within a short time and is then immediately extracted by the vacuum pump.





### VACUUM OVEN VO

29 | 49 | 101 litres  
 +20 °C to +200 °C  
 Pressure range:  
 5 to 1100 mbar

Whether for drying, conditioning or ageing – the vacuum oven VO stands for reliability, comfort and energy-efficiency – the latter thanks to a speed-controlled vacuum pump. It handles heat- and oxygen-sensitive substances with incomparable care and features assisted digital pressure control at turbo speed. Thanks to ramp programming of temperature and vacuum cycles unparalleled heating up and process times can be achieved. Each of the insertable shelves has its own sensor as well as separate shelf heating in order to uniformly keep all levels at the default set temperature.

#### POSSIBLE APPLICATIONS

- Determination of dry content/humidity content
- Drying and heating of powders, extracts and concentrates



### COOLED VACUUM OVEN VOcool

29 and 49 litres  
 +5 °C to +90 °C  
 Pressure range:  
 5 to 1100 mbar

As the first manufacturer worldwide, Memmert has developed a cooled vacuum oven. For cooling purposes, a compact, energy-saving and extremely precise Peltier cooling unit was integrated. This way, the Memmert cooled vacuum oven achieves a surface temperature distribution with a maximum deviation of  $\pm 1$  K.

#### POSSIBLE APPLICATIONS

- Drying and storage of starter cultures and bacteria
- Simulation of storage and transport conditions during intercontinental flights

## Application VOcool:

### Low temperature vacuum drying for laboratory application

Freeze-drying, the most common means of drying starter cultures and probiotics is very energy-intensive. Furthermore, some bacterial strains do not survive the freezing process. In the laboratory of the Technical University of Munich tests in the cooled Memmert vacuum oven VOcool contribute to the development of gentler and more energy-saving industrial low temperature vacuum drying technologies. Thanks to this drying process, unstable substances can be dried at moderate temperatures above zero without causing too much damage to the cell structure. The Memmert vacuum oven VOcool enables new applications in the food and pharmaceutical industry. For example, programmed and controlled transport and storage scenarios can be applied to determine the behaviour of active ingredients or volumes at different pressure and temperature conditions.

# Overview of possible applications

There is certainly a huge number of other application possibilities. We would be very pleased if you could tell us about your applications. Whatever the material, whatever the appliance and wherever you may be!

We would love to discuss with you your individual task at hand in order to find a suitable solution in the context of our standard programme or our customised designs.

Application	Appliance	Parameters
Photostability test of food containing dye and vitamins	Climate chamber <b>ICHeco L</b>	+10 °C to +60 °C, 10 to 80 % rh Fluorescent lights (cold white; daylight: light colour 865) and UV lights (320 – 400 nm) comply with standard illuminant D65
Stability test accelerated and intermediate tests, long-term storage	Climate chamber <b>ICHeco</b>	+10 °C to +60 °C, 10 to 80 % rh -10 °C to +60 °C
	Constant climate chamber <b>HPP</b>	0 °C to +70 °C, 10 to 90 % rh (HPP110 to HPP1060) +15 °C to +60 °C, 10 to 80 % rh (HPP1400)
	Cooled incubator <b>ICPeco</b>	-12 °C to +60 °C
	Humidity chamber <b>HCP</b>	+18 °C to +90 °C, 20 to 95 % rh
	Storage cooled incubator <b>IPS</b> Universal oven <b>U</b>	+14 °C to +45 °C +30 °C to +300 °C
Stress tests	Cooled incubator <b>IPP</b>	0 °C to +70 °C
	Cooled incubator <b>ICPeco</b>	-12 °C to +60 °C
Forcing test beer stability	Cooled incubator <b>IPP</b> Cooled incubator <b>ICPeco</b>	0 °C to +70 °C -12 °C to +60 °C
Microbiological tests, determination of bacterial counts, cultivation above and below room temperature	Incubator <b>I</b>	+30 °C to +80 °C
	Cooled incubator <b>ICPeco</b>	-12 °C to +60 °C
	Cooled incubator <b>IPP</b>	0 °C to +70 °C
	Storage cooled incubator <b>IPS</b>	+14 °C to +45 °C
	Universal oven <b>U</b>	+30 °C to +300 °C
	Steriliser <b>S</b>	+30 °C to +250 °C
Determination of dry content/ humidity content acc. to the oven drying method	Universal oven <b>U</b>	+30 °C to +300 °C
	Vacuum oven <b>VO</b>	+20 °C to +200 °C
Gravimetric determination water absorption	Constant climate chamber <b>HPP</b>	0 °C to +70 °C, 10 to 90 % rh (HPP110 to HPP1060) +15 °C to +60 °C, 10 to 80 % rh (HPP1400)
		+18 °C to +90 °C, 20 to 95 % rh
	Humidity chamber <b>HCP</b>	+10 °C to +60 °C, 10 to 80 % rh
	Climate chamber <b>ICHeco</b>	-10 °C to +60 °C
Drying and heating of food samples, pastes, (milk) powder, extracts, concentrates, fats, oils, chocolate and plant extracts for analysis, formulation and production	Universal oven <b>U</b>	+30 °C to +300 °C
	Cleanroom drying oven <b>UF750plus</b>	+30 °C to +300 °C
	Vacuum oven <b>VO</b>	+20 °C to +200 °C
Conditioning of PET bottles in a standard climate, for oxygen permeability testing or tastings	Constant climate chamber <b>HPP</b>	0 °C to +70 °C, 10 to 90 % rh (HPP110 to HPP1060) +15 °C to +60 °C, 10 to 80 % rh (HPP1400)
		+18 °C to +90 °C, 20 to 95 % rh
	Humidity chamber <b>HCP</b>	+10 °C to +60 °C, 10 to 80 % rh
	Climate chamber <b>ICHeco</b>	-10 °C to +60 °C
Ageing/heated storage (for example of packages for migration tests)	Incubator <b>I</b> Cooled storage incubator <b>IPS</b> Universal oven <b>U</b>	+30 °C to +80 °C +14 °C to +45 °C +30 °C to +300 °C
Shelf life tests of dairy products	Cooled incubator <b>IPP</b>	0 °C to +70 °C
Shelf life tests of cold cuts	Constant climate chamber <b>HPP</b>	0 °C to +70 °C, 10 to 90 % rh (HPP110 to HPP1060) +15 °C to +60 °C, 10 to 80 % rh (HPP1400)
Shelf life tests of gelatine gummy	Climate chamber <b>ICHeco</b>	+10 °C to +60 °C, 10 to 80 % rh
Sterilisation of laboratory glass	Steriliser <b>S</b>	+30 °C to +250 °C
Plant cultivation	Constant climate chamber <b>HPP</b>	+15 °C to +40 °C, 10 to 85 % rh white light (standard illuminant D5) or warm-white light (not available for HPP1060/HPP1400)
Temperature control of samples, plates, breeding media and emulsions in the laboratory	Universal oven <b>U</b>	+30 °C to +300 °C
	Waterbath <b>WNB/WNE/WPE</b>	+30 °C to +95 °C + boiling stage (with cooling unit CDP115 from +10 °C)
Thermogravimetric determination of residues in fluids	Universal oven <b>U</b>	+30 °C to +300 °C

www.ad-room.de

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