

Ageing Ovens

Cell Ageing Ovens with four or six cells
for precision ageing of rubber and plastic materials



EB 01-II and EB 19



EB 20

Cell Ovens

Elastocon presents our latest generation of cell ovens for the precision ageing of polymeric materials. We have produced and developed cell ovens and ageing cabinets since 1987. Benefitting from this long experience our ovens represent a major step forward in the design of such instruments.

Manufactured in 4 or 6 cell configurations, the ovens are available with either single temperature controller or multiple (individual) cell controllers.

- **Improved insulation for lower energy consumption.**
- **Lower surface temperature.**
- **Settings are done on a colour touch screen.**
- **Micro PLC control.**
- **Resettable countdown timer for each cell.**
- **Individual cell identifier - "Test name".**
- **Alarm history.**

Different models:

EB 01-II - cell oven, 4 cells one temperature for all cells, +40 to +200 °C

EB 01-IIHT - cell oven, 4 cells one temperature for all cells, +40 to +300 °C

EB 19 - cell oven, 4 cells individual temperature for each cell, +40 to +200 °C

EB 19HT - cell oven, 4 cells individual temperature for each cell, +40 to +300 °C

EB 20 - cell oven, 6 cells individual temperature for each cell, +40 to +200 °C

EB 20HT - cell oven, 6 cells individual temperature for each cell, +40 to +300 °C



Test Tube Ovens



Test Tube Oven EB 11, with 24 test tubes.



Test Tube Oven EB 14, with 3 x 6 test tubes and three temperatures.

These ovens are designed for ageing tests according to ASTM D 865 Rubber-Deterioration by Heating in Air (Test Tube Enclosure). The ovens can also be used for testing in liquids according to ASTM D 471 and ISO 1817 Effect of liquids. Glass tubes for both standards are included.

All Elastocon ageing ovens have two temperature instruments, one for controlling the temperature and one for indicating the temperature close to the samples.

Ageing Ovens, classic models



Cell Oven EB 01, with four cells. The test piece holder in each cell can take up to 24 standard test pieces.

The high temperature accuracy is achieved by using an aluminium block with channels for preheating of the air.



Cabinet Oven EB 10, ageing oven for precision ageing of rubbers and plastics under controlled conditions.

A factory set throttle to give a fixed air exchange rate of 7 or 14 changes per hour. The oven has separate systems for temperature control and indication with alarm.

Cabinet Ageing Ovens

Cabinet Ovens with excellent temperature stability and distribution achieved by using an inner chamber with a controlled air flow.

The ovens can be supplied in two sizes, with 60 or 120 l useful volume (EB 04-II and EB 10-II)

These ovens are ideal for ageing finished products and large test pieces which are unsuitable for cell ovens. Both shelves and rods are supplied with these ovens for accommodating most types of samples.



Cabinet Oven EB 04-II with air supply that requires external air and flow meter that can be set between 3-20 changes per hour.



EB 10-II with a factory set throttle to give a fixed air exchange rate of 7 or 14 changes per hour.

The temperature accuracy is very important for heat ageing tests, as a 1°C error in temperature corresponds to around 10 % error in test time.



Cabinet Oven EB 12-II, ageing oven for precision ageing of rubbers and plastics under controlled conditions and with high air speed.

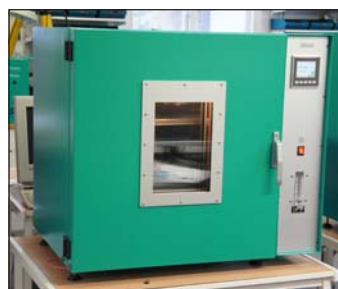
The oven EB 12-II has the same specification and external size as EB 10-II-60, except high air speed with laminar flow from bottom to top, and a reduced internal volume of 50 l. The EB 12-II meets the requirements in ISO 188 method B and ISO 4577.

Improved Ageing Ovens

Elastocon have launched a range of ovens which incorporate a number of improvements. The most obvious difference is the use of a small PLC with a colour touch screen.

Some of the improvements are:

- Improved insulation.
- Lower surface temperature.
- New touch screen control utilising a micro PLC.
- Countdown timers.
- Alarm history.
- Test names can be given.
- Improved door with new hinges and two point locking.
- Improved door sealing.
- Easier shelf installation and removal.
- New four glass window (option EB 04-IIW).
- Sensor that turns off the fan and heating when opening the door (option EB 04-IIDS).



EB 04-II W

Insert for ASTM

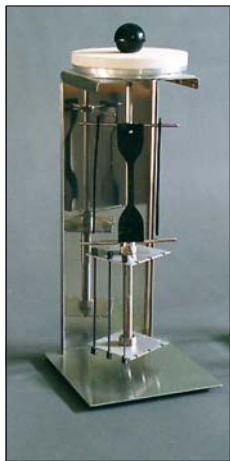
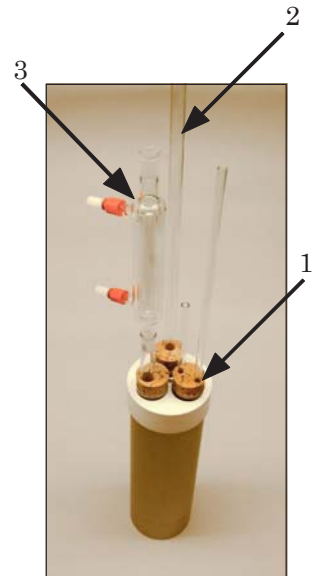
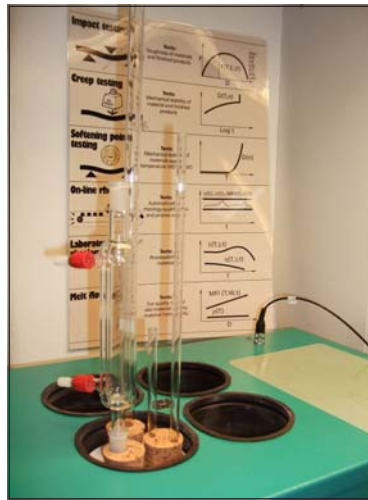
The insert has three test tubes for testing according to ASTM D865 Heat Ageing and ASTM D471 Testing in liquids, and fits EB 19, EB 20, EB 01 and EB 07.

The glass tubes can be supplied with a grounded joint for a stopper or for a water cooler.

The glass tube system is also very suitable for testing in liquids according to ISO 1817.

The photo shows the three configurations.

1. ASTM D865 Heat ageing
2. ASTM D471 Liquids with air cooler
3. ASTM D471 Liquids with water cooler



Stand EB 01.01, stand to support the sample holder while mounting test pieces for ageing.



Sample Holder, for our cell ovens.



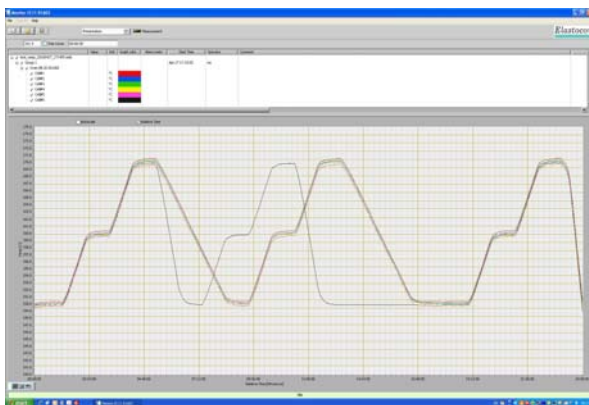
Tension Set Rig EV 04, according to ISO 2285.



Compression Set Rig EV 03, according to ISO 815-1.

Accessories for the Elastocon Cell Ovens

Monitoring oven temperatures



EC 11 is a data monitoring software monitoring instruments such as ovens and laboratories for temperature and humidity.

In the software it is possible to set alarm limits.

The software has three main windows, one to see actual temperature values and corresponding curves, one for comparing historical data and one for setting the communication with the amplifiers.

Sensors for temperature, humidity, pressure, displacement, V, mA etc are connected to a data box with amplifiers. Each data box can have 1 to 24 inputs for different sensors. One or more data boxes are connected via a network connection to a computer running the Monitor Plus software. Several data boxes can be situated in different rooms and be connected to the logging computer via the company network.

EC 11.01 is a viewer software making it possible to view the results from any computer in the network.

Technical specification, Cell Ageing Ovens

	EB 01-II	EB 19	EB 20
Temperature range, °C:	+40 to +200 (HT=300 °C)	+40 to +200 (HT=300 °C)	+40 to +200 (HT=300 °C)
Temp. control, 40 - 200 °C, °C:	± 0,5	± 0,5	± 0,5
201 - 300 °C, °C:	± 1,0	± 1,0	± 1,0
Temp. variation in time and space, °C:	± 0,25	± 0,25	± 0,25
Temperature sensors:	Pt 100, 1/3 DIN	Pt 100, 1/3 DIN	Pt 100, 1/3 DIN
No. of temperatures:	1	4	6
No. of cells:	4	4	6
Air speed, m/s:	<0,001	<0,001	<0,001
Air changes, changes/hour:	3 - 20	3 - 20	3 - 20
Useful volume, l:	4 x 2,4	4 x 2,4	6 x 2,4
Dimensions, inner, dia x h, mm:	100 x 300	100 x 300	100 x 300
Dimensions, external, w x h x d, mm:	760 x 500 x 510	760 x 500 x 510	960 x 500 x 510
Weight, kg:	45	55	74
Voltage, V/phase/freq:	220-240/1/50 (110-120/1/60)	220-240/1/50 (110-120/1/60)	220-240/1/50 (110-120/1/60)
Power, W:	900	900	1 300
Standards:	ISO 188, method A IEC 811	ISO 188, method A IEC 811	ISO 188, method A IEC 811

Common specifications:

- The ovens perform well inside the apparatus requirements in ISO 188, IEC 811 and other equivalent standards.
- The ovens are controlled from a PLC (with a colour touch screen).
- Special design with controlled air exchange rate and low air speed.
- The casing consists of steel, painted with powder paint in bluegreen colour.
- The inner cells are made of aluminium.
- Temperature controller with 0,1°C set point (PLC).
- Temperature indicator with sensor in each cell (PLC).
- Fixed over temperature fuse.
- Flowmeters with needle valves, for setting the air exchange rate.
- The air speed is low and is dependent on the air exchange rate only, as specified in ISO 188 method A and IEC 811.
- Alarm for low air pressure (PLC).
- Built in air pump.
- Cooling channels in the casing for low surface temperature.
- Temperature controlled cooling fan for the electronics cabinet.
- Indication of power failure (PLC).
- Run-time meter (PLC).
- Countdown timer (PLC).
- Microfilter for the air which removes 99,99 % of all particles over 0,1 µm.
- Also available as high temperature versions up to 300 °C.

Optional accessories

EC 11 Monitor Software

Network cable

EB-P Ramp function for temperature settings in the PLC

ED 04 Computer, Pc

ED 06 UPS 1000 VA double converter

Elastocon manufactures a range of ageing ovens for precision ageing of rubbers and plastics under controlled conditions. All ovens conform to ISO 188, IEC 811 and other technical equivalent standards. The ovens are designed to give very low temperature variations in time and space, low or high air speed and controlled air exchange rate. Good control of temperature, air speed and air exchange rate have been shown to be very important to achieve good repeatability and reproducibility when doing heat ageing tests of polymer materials. Research done in Sweden shows that the air speed is a very important factor, influencing the ageing results by increased evaporation of softeners and antioxidants and by increased oxidation at higher air speeds. Elastocon ageing ovens have a low air speed, dependant of the air exchange rate only, or specified high air speed (1m/s) to allow tests to be performed investigating the influence of air speed.

Technical specification, classic Ageing Ovens and Test Tube Ovens

	EB 01	EB 10	EB 11	EB 14
Temperature range, °C: (°C)	+40 to +200	+40 to +200	+40 to +200 (HT=300 °C)	+40 to +200 (HT=300 °C)
Temp. control, 40 - 100 °C, °C:	± 0,5	± 0,5	± 1	± 1
101 - 200 °C, °C:	± 1	± 1	± 2	± 2
201 - 300 °C, °C:	-	-	± 3	± 3
Temp. variation in time and space, °C:	± 0,25	± 0,25	± 0,5	± 0,5
Temperature sensors:	Pt 100, 1/3 DIN	Pt 100, 1/3 DIN	Pt 100, 1/3 DIN	Pt 100, 1/3 DIN
No. of temperatures:	1	-	1	3
No. of cells:	4	-	-	-
Test Tubes:	-	-	24	3 x 6
Air speed, m/s:	<0,001	<0,001	-	-
Air changes, changes/hour:	3 - 20	7 or 14*	-	-
Useful volume, l:	4 x 2,4	60	-	-
Dimensions, inner, dia x h, mm:	100 x 300	450 x 450 x 300	-	-
Test Tube-dimensions dia x h, mm:	-	-	38 x 300	38 x 300
Dimensions, external, w x h x d, mm	575 x 465 x 400	750 x 700 x 550	575 x 465 x 400	575 x 465 x 400
Shelf positions:	-	3	-	-
Shelves:	-	2	-	-
Sample rod positions	-	15	-	-
Sample rods	-	10	-	-
Weight, kg:	45	82	72	66
Voltage, V/phase/freq:	220-240/1/50 (110-120/1/60)	220-240/1/50	220-240/1/50 (110-120/1/60)	220-240/1/50 (110-120/1/60)
Power, W:	900	2 100	900	700
Standards:	ISO 188, method A IEC 811	ISO 188, method A IEC 811 <i>*preset by manufacturer</i>	ASTM D865 ASTM D471 ISO 1817	ASTM D865 ASTM D471 ISO 1817

Common specifications:

- The ovens perform well inside the apparatus requirements in ISO 188, IEC 811 and other equivalent standards (EB 01, EB 10).
- The ovens perform well inside the apparatus requirements in ASTM D865, ASTM D471 and ISO1817 (EB 11, EB 14).
- Special design with controlled air exchange rate and low air speed (EB 01, EB 10).
- The casing consists of steel, painted with powder paint in bluegreen colour.
- The inner cells are made of aluminium, (EB 01) and stainless steel (EB 10).
- Temperature controller with 0,1°C set point.
- Solid state relay for safe control.
- Temperature indicator with sensor in the cell (EB 01) and inner chamber (EB 10).
- Temperature indicator with sensor in one test tube (EB 11), three test tubes (EB 14).
- Fixed over temperature fuse.
- Fixed set air exchange rate of 7 or 14 changes per hour (EB 10).
- Flowmeters with needle valves, for setting the air exchange rate (EB 01).
- The air speed is low and is dependent on the air exchange rate only, as specified in ISO 188 method A and IEC 811 (EB 01, EB 10).
- Alarm for low air pressure (EB 01).
- Microfilter for the air which removes 99,99 % of all particles over 0,1 µm (EB 01).
- Built in air pump (EB 01).
- Cooling channels in the casing for low surface temperature.
- Temperature controlled cooling fan for the electronics cabinet.
- Indication of power failure.
- Run-time meter.

Optional accessories

- EC 11 Monitor Software
- Network cable
- ED 04 Computer, Pc
- ED 06 UPS 1000 VA double converter

Technical specification, Cabinet Ageing Ovens

	EB 04-II	EB 10-II	EB 12-II
Temperature range, °C:	+40 to +200 (HT=300 °C)	+40 to +200 (HT=300 °C)	+40 to +200 (HT=300 °C)
Temp.control, 40 - 200 °C, °C:	± 0,5	± 0,5	± 0,5
201 - 300 °C, °C:	± 1,0	± 1,0	± 1,0
Temp.variation in time and space, °C:	± 0,25	± 0,25	± 0,25
Temperature sensors:	Pt 100, 1/3 DIN	Pt 100, 1/3 DIN	Pt 100, 1/3 DIN
Air speed, m/s:	<0,001	<0,001	1± 0,5
Air changes, changes/hour:	3 - 20	7 or 14 *1	7 or 14 *1
Useful volume, l:	60 (120)	60 (120)	50
Dimensions, inner, w x h x d, mm:	450 x 450 x 300 (550 x 550 x 400, 120 l)	450 x 450 x 300 (550 x 550 x 400, 120 l)	450 x 450 x 250
Dimensions, external, w x h x d, mm:	810 x 720 x 620 (910 x 820 x 720, 120 l)	810 x 720 x 620 (910 x 820 x 720, 120 l)	810 x 720 x 620
Dimension, window, 4 glass, mm:	200 x 300 (option)	200 x 300 (option)	200 x 300 (option)
*2 Illumination of the inner chamber:	24V, 10 W halogen	24V, 10 W halogen	24V, 10 W halogen
Sample rod positions:	15 (24 120 l)	15 (24 120 l)	15
Sample rods:	10 (12 120 l)	10 (12 120 l)	15
Shelf positions:	3	3	-
Shelves:	2	2	-
Weight, kg:	87 (115 120 l)	86 (114 120 l)	86
Voltage, V/phase/freq:	220-240/1/50 - 60	220-240/1/50 - 60	220-240/1/50 - 60
Power, W:	2 100	2 100	2 200
Connections:	Compressed air	—	—
Standard:	ISO 188, method A IEC 811	ISO 188, method A IEC 811 ASTM D 3012	ISO 188, method B ISO 4577
*2 (only available with the window option)			*1 preset by manufacturer

Note: Observe that EB 04-II needs connection to compressed air for the air exchange. We can supply a silent air compressor EA 01.

Common specifications:

- The ovens perform well inside the apparatus requirements in ISO 188, IEC 811 ASTM D 3012 , ISO 4577 and other equivalent standards.
- Special design with controlled air exchange rate and low or high air speed.
- The casing consists of steel, painted with epoxy powder paint in bluegreen colour.
- The inner chamber is made of stainless steel.
- Temperature controller with 0,1°C setpoint (PLC).
- Solid state relay for safe control.
- Temperature indicator with sensor in the inner chamber.
- Fixed over temperature fuse.
- Fixed set air exchange rate of 7 or 14 changes per hour (EB 10-II, EB 12-II) or adjustable via flow meter (EB 04-II).
- The air speed is low and is dependent on the air exchange rate only, as specified in ISO 188 method A and IEC 811 (EB 04-II, EB 10-II).
- High and laminar air speed as specified in ISO 188 method B (EB 12-II).
- Cooling channels in the casing for low surface temperature.
- Controlled cooling fan for the electronics cabinet.
- Indication of power failure (PLC).
- Run-time meter (PLC).
- Countdown timer (PLC).



Optional accessories

EB 04-IIW, four pane glass window and lamp illuminating the inner chamber (for EB 04-II, EB 10-II and EB 12-II).

EB 04-IIDS, door sensor that turns off fan and heating when the door is opened (for EB 04-II, EB 10-II and EB 12-II).

Option **HT**, with temperature range up to + 300 °C.

EC 11, monitoring software.

ED 04, computer, pc.

ED 06, UPS 1000 VA double converter.

Network cables.

EB-P, ramp function for temperature setting in the PLC.

EA 01, silent air compressor (suitable for EB 04-II).