

## OZONE TESTING SYSTEMS SIM

### Testing Chambers, Ozone Generation and Control

#### Ozone Testing in the Rubber Industry

Ozone is naturally occurring triatomic oxygen, typically present in the atmosphere in concentrations of up to 10 - 15 parts per hundred million (pphm) of air, occasionally higher. Even at these low levels, ozone reacts readily with unsaturated elastomers, promoting cracking and possible failure of rubber parts in service.

Ozone test chambers provide an effective means of assessing the resistance of rubber compounds to ozone degradation under controlled atmospheric conditions.

#### Anseros Testing Systems

Anseros test chambers are available with internal capacities of 50 to 8,000 litres, permitting the testing of large products as well as laboratory specimens.

Ozone is generated using a long-life Corona Discharge tube and measurement is done by maintenance-free UV Absorption. Ozone concentrations are controlled continuously and automatically up to 200 pphm (or higher), with chamber temperatures up to 70°C and optionally relative humidity up to 80%. Furthermore, proprietary AMACS software allows remote operation by PC.



SIM 6050

#### Key Benefits

- ++ stable ozone supply without deterioration of the generator electrodes with time
- ++ calibration-free spectroscopic ozone measurement, requiring no chemicals
- ++ exhaust gas catalyser, eliminating discharge of ozone into the atmosphere, for a safe environment
- ++ continuous unattended operation

## Testing Systems

### Ozone Generation

Ozone is generated by means of corona discharge. The discharge electrodes are not directly located in the ozonised air stream and thus protected from deterioration in the oxidising ozone atmosphere. The ozone supply is very stable, its flow is controllable across a wide range. Ambient air is used as intake, with no need for humidity control.

### Ozone Measurement and Control

Ozone concentration is measured with a single-beam UV photocell that requires no routine calibration. The preparation and control of chemicals associated with electrolytic ozone measurement can thus be eliminated. Furthermore, the applied measurement principle offers superior precision.

The range of measurement of the UV photocell is adjustable, with a resolution of 0.1% of the chosen range. Temperature and pressure compensation is automatic.

Ozone concentration is controlled continuously via a PID servo with adjustable ranges.

### Humidity Control

Peltier units provide silent and maintenance-free humidity control.

### AMACS Software

AMACS software allows remote control from a central computer, with output to a printer/recorder. Data logging and service interrogation can be made via the internet.

### Operational Safety

Anseros test chambers operate below atmospheric pressure, preventing any tendency for ozonised air to escape into the laboratory atmosphere.

A door safety interlock ensures that the test chamber cannot be opened until the ozone concentration is below a safe limit. Discharge of residual ozone to the atmosphere is prevented since all ozone in the exhaust stream is destroyed by catalysis before discharge.

The test chambers are stand-alone systems, requiring no ducting or water supply, thus simplifying laboratory installation.

## Standard Testing Systems

### 6050-T System

- 50 litre test cabinet
- ozone generator, analyser and controller
- temperature control
- exhaust gas catalyser
- particle filter, carbon and gas filter

### 6050 System

- all features of 6050-T system
- humidity control
- recorder

### 6300 System

- 170 litre test cabinet
- all features of 6050 system
- rotation disc for static and dynamic tension tests on 16 sample pieces

### Retrofit Packages

Retrofit packages are available for existing test cabinets to provide ozone generation, measurement and control capability.

## Custom Testing Systems

Test cabinets with internal capacities between 50 and 170 litres, and also over 170 litres up to 8 m<sup>3</sup> are available on special order.

## System Options

AMACS software for ozone, temperature and humidity control by personal computer

Ozone safety sensor

PC, printer and interface

Sample clamping rigs for static tension, static bending, and static+dynamic tension.

Ozone sensors for personal safety monitoring.

## Conformance with International Standards

Anseros testing systems meet the requirements of international testing standards ISO 1431, DIN 53509 and ASTM D1149.

**Ozone Generator Unit**

principle	corona discharge
tracing gas	ambient air
gas connections	¼ inch
power requirements	230V/50Hz

**Ozone Measurement Unit**

principle	single beam ultra violet absorption
range	0-100/1000/10000 pphm
detection limit	1 pphm
accuracy	2% of reading or 1pphm, whichever is higher
repeatability	0.2% of range
temperature compensation	automatic in the range 0-60°C +/- 1°C
pressure compensation	automatic in the range 600-1200 mbar +/- 2 mbar
gas connections	¼ inch
power requirements	230V/50Hz

**Testing Systems**

	6050-T	6050	6300
chamber inner lining:	Stainless steel		
chamber door:	with viewing window		
velocity of air inside chamber:	600 mm/s		
air exchange rate:	400 l/h		600 l/h
temperature: range:	26 - 60 °C (RT = 23°C)	15 - 70 °C (RT = 23 °C)	
temperature: accuracy:	± 0,5 K		
temperature: recovery:	0,4 K/min		
humidity: range:	ambient humidity	30 - 80 % relative humidity	
humidity: accuracy:	-	-1/+4 % of % relative humidity	
recovery time to reach 95% of set humidity:	-	20 min	
ozone: control:	automatic (PID type)		
ozone: test range:	25 – 200 pphm (other ranges to order)		
ozone: accuracy:	± 5 pphm (in the test chamber)		
recovery time to reach 95% of set ozone concentration:	10 min		
power supply:	230 V/50 Hz		
overall chamber size (width, height, depth)	670x620x510 mm	670x620x510 mm	950x870x610 mm
free, usable space of chamber, free volume	425x460x270 mm 50 litre (52,7)	425x460x270 mm 50 litre (52,7)	680x650x400 mm 170 litre (178,6)
size of generator, controller and monitor unit (h,w,d)	650x550x600 mm		1600x550x600 mm

Advanced technology for efficient ozone resistance testing in the rubber industry:

- sensitive and reliable ozone generation, measurement and control
- temperature and humidity control
- testing rigs for tension and bending, in static, dynamic and static+dynamic modes
- unattended, continuous operation
- optional remote operation via PC, with internet access if required.
- test chambers for small laboratory samples or large moulded products
- custom-made systems, individually adapted to your specific requirements

Retrofit ozone generation and control modules are available for existing test chambers.

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