

# MARC 7000 - Tritium Sampler

Vapour, Gas and Organic (OBT) tritium monitoring, in compliance with NF M60-312 standard

The Marc 7000 tritium sampler is the perfect instrument for measuring low levels of tritium in air. Particular applications include sampling of air from stacks, hoods, rooms and the environment.



## Operating principle

The Marc 7000 is widely used and recognised within the international nuclear industry, and in particular; nuclear power plants, nuclear research centers, radioactive waste treatment facilities and isotope laboratories.

The bubbler has been specifically designed with efficient tritium capture in mind, using a series of four vials, a cooling system and a catalytic furnace to collect both tritium vapour (HTO) and gaseous tritium (HT) or organic bound tritiated (OBT).

The tritium activity is measured in the collected sample on a daily, weekly or monthly basis with a liquid scintillation counter and related to the sampled volume of air in order to calculate the tritium-in-air concentration. This gives an efficient way to monitor tritium levels with a much higher sensitivity than even the most sophisticated real-time tritium monitor.

## Main Features

- Reduced evaporation due to the cooling system, allowing weekly collection.
- Flow rate regulated.
- Membran air pump (long life time).
- Particulates filtration at inlet.
- Aeraulic circuit made of stainless steel.
- Easy to use, with instant opening cabinet for sample retrieval.
- Display of flow rate and sampled air volume in real time.
- Alarms report.
- Faults memorisation.
- Low required space.
- Full options and accessories.

### Trapping Yield

- HTO : 99 %  $\pm$  7%
- Furnace efficiency : 98 %  $\pm$  11% (HT > HTO)

Test report from CEA Marcoule - June 2006



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## Airflow process

A pre-filter paper in the inlet ( $\varnothing$  45 mm) prevents dust intake and the electronic flow meter is protected by Goretex® filters. The air-flow passes into the vials (250 ml capacity) through stainless steel air tubing. The air flow can be set from 10 to 50 litres per hour, regulated by a certified airflow meter.

## Oxidation furnace

Stainless steel tubular furnace equipped with Pd alumina catalyst pellets. The oven temperature can be set between +200°C to +500°C.

## Cooling system of the collecting vials

The sampler is fitted with a condenser cooling block, which allows the vials to be cooled to between +7°C and +15°C (depending on the ambient temperature). A pump ensures flow of the cooling liquid and a level gauge allows the direct control of the liquid level in the circuit. All tubing is made of stainless steel.

## LCD Display

- Furnace temperature
- Cooling liquid temperature
- Instant air flow and total volume
- Duration of sampling
- Alarms

## Technical Specifications

- Dimensions: W x H x D = 700 x 356 x 270 mm.
- Required space: W x H x D = 1000 x 600 x 530 mm.
- Weight : 29 kg.
- Power : 700 Watts max.
- Power supply : 230 V / 50 Hz IEC plug (or 120 V / 60 Hz IEC plug).
- Inlet and outlet :  $\varnothing$  6,4 mm.
- Temp (Operating) : +2°C to +45°C.
- Temp (Storage) : -5°C to +70°C.
- Electrical protection : Differential circuit breaker (sensivity = 30mA) .
- Frame : monocoque in aluminium alloy.
- Decontamination compliant housing paint.
- Glass vials.
- Delivered with power supply cable , four vials with caps, calibration certificates and user guide in english.



**MARC 7000 tritium and HAGUE 7000 carbene 14 samplers installed on a stainless steel shelf, with atmospheric sampling probes.**



*For a fast activity measurement on place see our portable liquid scintillation counter:*

**DPM 7001 with dual photomultiplier**

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