

CONGOTECH

THERMAL STABILITY OF PVC COMPOUND

Commercial reference(s): MO10-00



Type of tests:
Thermal

Type of materials:
Thermoplastics

Standards:
ISO 182-2

INTRODUCTION

The **Congotech** was conceived like a simple and autonomous tool for control of the thermal stability of compounds PVC. Its use requires only few precautions and training.

The principle of measurement is simple: When it is subjected to a thermal stress, PVC is degraded, which involves, inter alia things, the release of hydrochloric acid (HCl) gas.

A specific paper pH, the Congo red, has the effect of transferring red with blue when the pH reaches a value close to 3,5 (recall: the pH is the measuring unit of the acidity of a product, it is proportional to the content of

this product of H^+ ions).

The method of appreciation of the thermal stability of the compound consists in timing, at a given temperature, time necessary so that a given quantity of PVC makes transfer the paper of the red to blue ■

APPLICATIONS

Congotech is completely in agreement with this standard :

✓ ISO 182 (2001) : Plastics - Determination of the tendency of compounds and products based on vinyl chloride homopolymers and copolymers to evolve hydrogen chloride and any other acidic products at elevated temperatures - Part 1: Congo red method ■

DESCRIPTION

Congotech is composed of two parts: the apparatus and software.

◆ The apparatus

The apparatus is composed of four assembled elements to give a compact unit:

A PVC sample is placed in a test tube. This tube is placed in the Congotech, whose radiator is controlled at the desired temperature.

The originality of **Congotech** lies in its system of measurement:

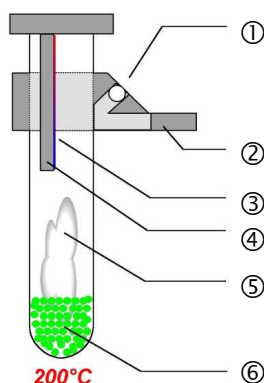
A paper pH is placed on a PTFE support (for a cleaning more effective) and maintained by 2 points of adhesive, this paper is placed in front of an optical system that allows locating its turn; (Change of color).

The data are sent via a USB cable to a software (computer) and displayed as a curve.



Caption:

- | | |
|-----------------------|-----------------------------|
| 1- Measurement system | 3- Test signal |
| 2- pH paper holder | 4- pH paper holders support |



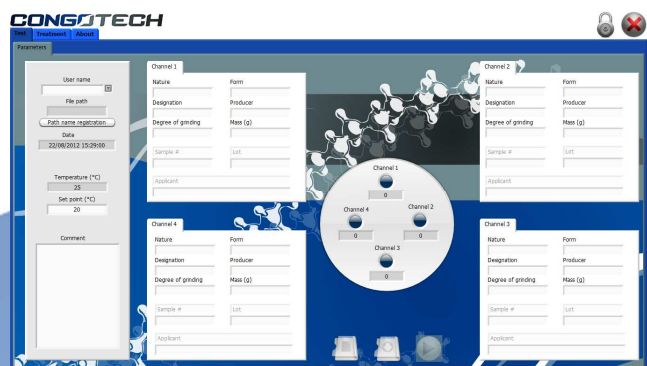
Caption:

- | |
|-----------------------|
| 1- Red LED |
| 2- IR Photodiode |
| 3- Congo red pH paper |
| 4- PTFE support |
| 5- HCL gas |
| 6- PVC |

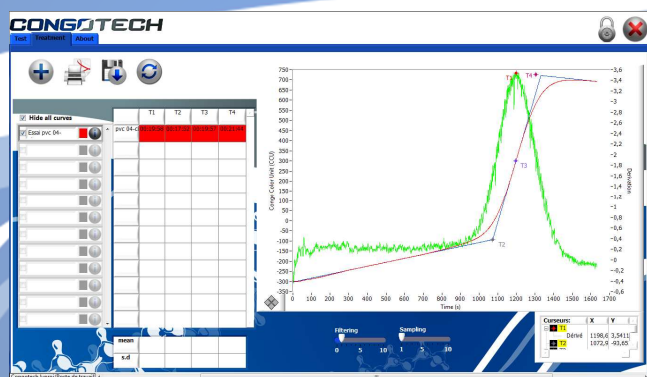
◆ The software

Available in French or English language, it allows choosing the temperature of tests. The temperature is visible at each stage (real temperature, set point, and impulse of heating).

Information of the sample is safeguarded with the data file, which could be open later on for treatment and analyses.



Screen of entry of the test parameters.



For each way the mass is entered.

The analyse of the results is very simple. At the same time as the opening the curves are analysed. The point of dechloruration is given by the derivative of each curve of test ■

THE UTILIZATION

◆ Nature of the samples

The samples are composed of 3 grams compounds of PVC placed in a tube out of disposable glass with following dimensions:

Length	160 mm
Diameter	15 à 16 mm
Thickness	1 mm

◆ Preparation of the samples

Nature	Method
Plastisols	Gelify on a glass plate (gel thickness : 0,5 mm). Cut in 2 mm pieces
Granules	If granule size > 1,4 mm, uniformly crunch
Films, foils	Cut in 2 mm pieces

♦ pH paper

pH paper used is a Congo Red type. It has the effect of transferring red in blue with a pH close to 3,5.

In order to facilitate its use and to maintain paper perpendicular to the ray of the measuring cell, paper pH is provided in strip form, placed before each test on a PTFE special support, and maintained by two points of adhesive resistant to high temperatures.

♦ Course of a test

Configure the test on the software: temperature of regulation, information concerning the product tested, etc.

Prepare the test tubes, and note the mass of each one on the software.

Place the tubes to be tested with its cap in the opening.

The test is launched.

From this moment the curves are displayed. They represent the change of color of the pH paper. The point of dechloruration is given by the maximum of the derived curve.

The examination of the tests is carried out thanks to the software ■

DELIVERED ACCESSORIES

⇒ A starter kit :

- 100 test tubes, 16x160 mm;
- 1 roll (5 m) of Congo red pH paper;
- 1 set of 500 elastic rings

- ⇒ An IEC type power cord;
- ⇒ A calibration certificate;
- ⇒ An instruction manual;
- ⇒ A CE certificate ■

CONSUMABLES

- ⇒ 5 m of Congo red pH paper (ref. : MO10-03)
- ⇒ Set of 500 (16x160 mm) glass tubes (ref. : MO10-04)
- ⇒ Pack of 500 fixing elastics high resistance (ref. : MO10-05) ■

TECHNICAL CHARACTERISTICS

Dimensional feature:

- Length	600 mm
- Depth	370 mm
- Height	240 mm
- Mass	25 kg

Electric alimentation

230 V, 50Hz

Test tube:

- Length	160 mm
- Diameter	16 mm

Color measurement:

- Precision	± 1 CCU
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Temperature measurement:

- Range of measurement	20 – 250 °C
- Precision	± 0,1 °C

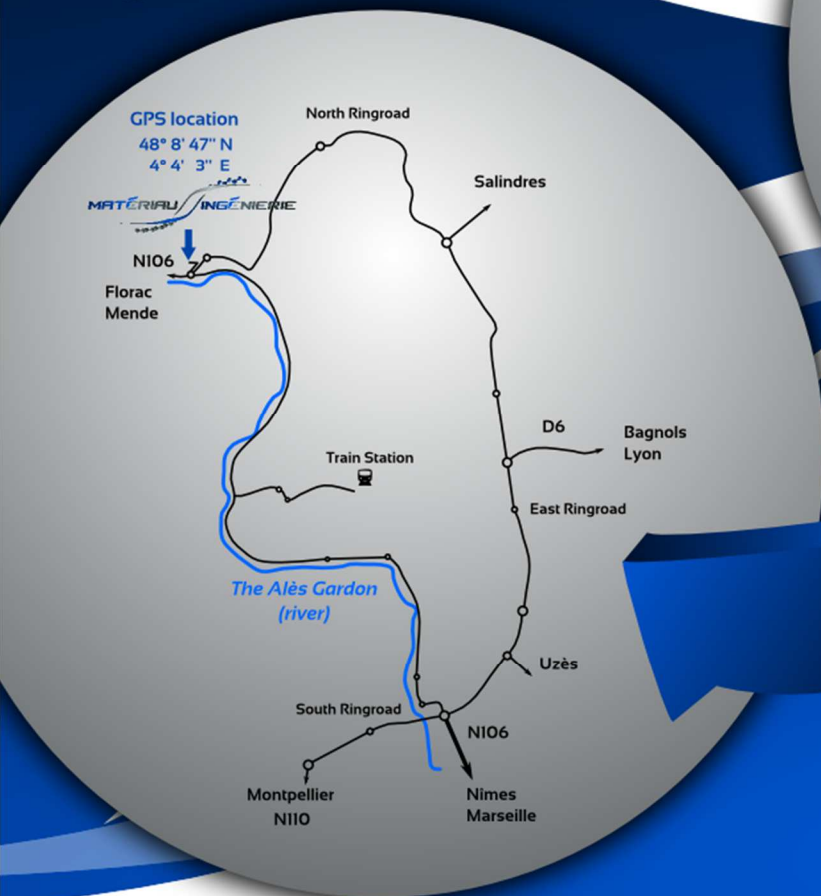
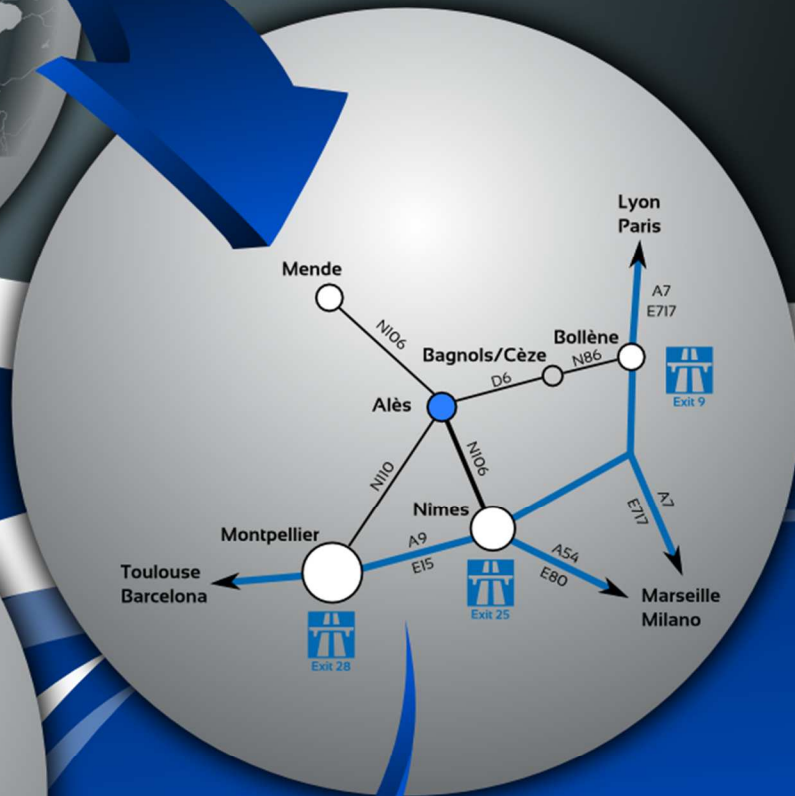
PC configuration:

- OS	7/XP (32 or 64 bit)
- RAM	2 Go mini
- Graphic resolution	1366 x 768 p
- Disk space	500 Mo
- Display	15" mini
- Graphics card	8 Mo mini
- Peripherals	keyboard,, mouse DVD player ■

* Features for information only, we reserve the right to change freely in order to improve the performance of our test unit.

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