

The art of innovation

Standard Test Method for Carbon Black in Olefin Plastics based on ASTM D 1603-94 and ISO 6964-1986 (E)

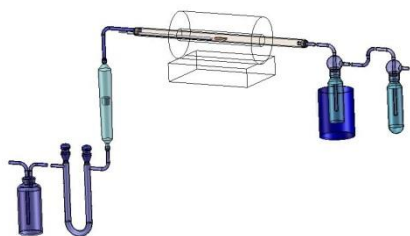


Fig. 1 Assembly of the apparatus

MicroOptik provides a complete package to measure total Carbon black in polyolefin.

ASTM D 1603-94

This flyer describes the D 1603-94 and ISO 6964-1986 (E) Standard Test Methods. These methods are used to determine total Carbon black in olefin plastics. ("In Olefin Plastics and "Polyolefin pipes and fittings – Determination of carbon black content by calcination and pyrolysis – Test method and basic specification.). The method covers the determination of the carbon black content in polyethylene, polypropylene and polybutylene. The determination of carbon black is made after pyrolysis of the sample under an inert gas (i.e. N₂). The test method is not valid if the resin contains non-volatile fillers or pigments other than carbon black. See details of Scope in the ASTM D 1603-94 norm.

The following apparatus are used:

Dreschel Bottle
Bubbler bottle
Pyrex reactor tube
Glass tubing plus matching rubber & pastic
Bunsen Burner
Flow meter
Neoprene stoppers with glass tubes
Ground glass stopper
Solid Tube furnace
Muffle furnace
Iron-Constantan Thermocouple
LED Temperature Indicator
Zirconia Combustion Boat
Desiccator with desiccant

The following reagents and Materials are used:

Carbon dioxide (drye Ice)
Dessicant, such as CaCl₂
Nitrogen, Low oxygen content (see ASTM)

PM 1525 Total carbon black in polyolefin determination

Once the system is commissioned the analysis can be carried out. MicroOptik provides the complete package.

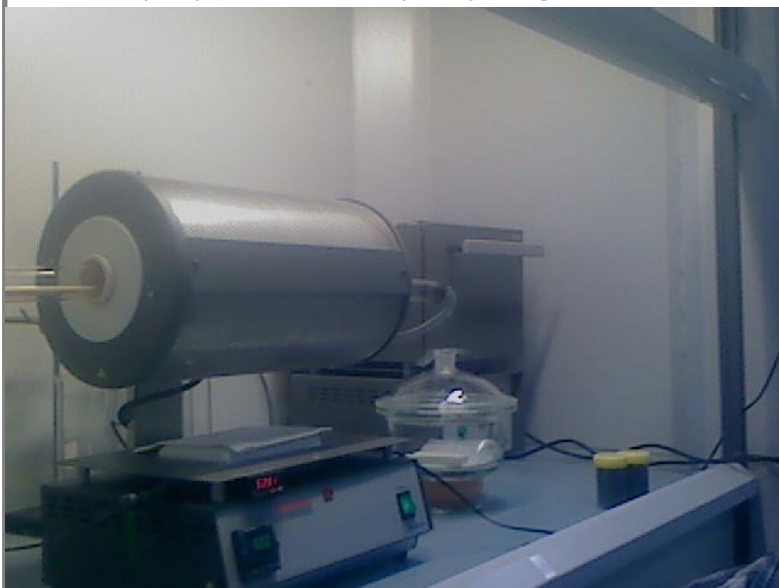


Fig. 2 Complete total carbon black analysis system (in fumehood)

Principles of the analysis

The first step of the analysis is a pyrolysis of the material at 500°C. The subsequent step is a calcination of the remaining sample at 900°C. The carbon black content is expressed as a percentage by mass, through the following formula: $(m_2 - m_3) / m_1 \times 100$, where m_1 = the mass, in grams, of the test portion | m_2 = the mass, in grams, of the sample boat plus the test portion after pyrolysis at 500°C | m_3 = the mass, in grams, of the sample boat after calcination at 900°C, with ash where appropriate. | The analysis has to be carried out in threefold and the arithmetic mean is reported. The ash yield is expressed as a percentage of the original mass from the formula: $(m_3 - m) / m_1 \times 100$ where m = the mass, in grams, of the sample boat. | m_1 and m_3 as above.



Fi. 3 Overview of Complete system

The MicroOptik total carbon in olefin plastics package contains all hardware required to carry out the analysis, as well as a full procedure. The procedure can be provided in all languages.

Ask our sales representatives for more information. | info@microptik.eu