

Naval Engineering Standard

(NES 713)

firetesting
technology



NES 713:

U.K. Naval engineering standard for the determination of the toxicity index of the products of combustion from small specimens of material

The NES 713 test explores the toxicity of the products of combustion in terms of small molecular species arising when a sample of a material is completely burnt in excess air under specified conditions. The test does not necessarily determine the total toxicity of all the constituents of the products of combustion.

The test is useful for the quality control of materials and for research and development. It may be used to compare the particular combustion characteristic of a series of both natural and synthetic materials. The test may be used to specify a quality of a raw material or product. Combustion characteristics tests alone are not suitable for assessing the total fire hazard of products under actual fire conditions.

The toxicity index is defined as the numerical summation of the toxicity factor of selected gases produced by complete combustion of the material in air under the conditions specified. The toxicity factors are derived from the calculated quantity of each gas that would be produced when 100g of the material is burnt in air in a volume of 1m³.

Features and Benefits

The **FTT** NES 713 is a closed chamber of fixed volume in which specimens can be subjected to a premixed burner.

The system comprises of the Combustion Chamber, Combustion Control Unit and a Gas Analysis System with colorimetric tubes.

- The combustion chamber has a strong steel framework and is constructed from fire retardant grade polypropylene with welded seams and a volume of 0.7m³.
- The door, which gives full access to the chamber for easy cleaning, incorporates a clear polycarbonate sheet, backed with laminate for strength and rigidity.
- The gas burner has a spark ignition system which automatically re-ignites should the flame extinguish.
- An internally mounted stirring fan for rapid mixing of combustion products.
- Solenoid operated vent seal
- Provision is made for gaseous/volatile test products to be drawn from the chamber for analysis through ports on the side of the chamber. At least 12 sampling positions are provided for use with colorimetric gas reaction tubes or optional specific gas analysers.
- A separate control unit houses the flowmeters, timer, methane and air controls.
- A forced-air extraction system for evacuating the chamber after a test.

The Control Unit houses the flowmeters, timer, methane and air controls



TECHNICAL SPECIFICATION**Combustion Chamber**

Measuring principle	Determination of combined toxicity index of gaseous species arising from a material subject to flaming combustion
External dimensions	1100mm (W) × 800mm (D) × 1300mm (H)
Internal dimensions	728mm (W) × 982mm (D) × 982mm (H)
Internal volume	0.7m ³
Burner	Bunsen burner and spark igniter with safety sensor
Maximum temperature	1200°C
Weight	70kg

Control Unit

Dimensions	530mm (W) × 270mm (D) × 280mm (H)
Flowmeter	Valves for Natural Gas/Methane and Air
Second/Minute timer	Digital timer

Dräger Gas Detection Tubes

Carbon Dioxide	0.1-6%	± 5-10%
Carbon Monoxide	5-700 ppm	± 10-15%
Hydrogen Sulphide	1-200 ppm	± 15%
Ammonia	0.5-10%	± 10-15%
Formaldehyde	0.2-5 ppm	± 20-30%
Hydrogen Chloride	1-10 ppm	± 10-15%
Acrylonitrile	0.2-50 ppm	± 15-20%
Sulphur Dioxide	1-25 ppm	± 10-15%
Nitrous Fumes	2-100 ppm	± 10-15%
Hydrogen Cyanide	0.5-50 ppm	± 10-15%
Hydrogen Fluoride	0.5-90 ppm	± 20-30%
Phosgene	0.02-1 ppm	± 10-15%
Phenol	1-20 ppm	± 10-15%
Hydrogen Bromide	1-10 ppm	± 10-15%

Due to **FTT's** continuous development policy specifications could change without prior notice.

SERVICES

Power	Dual voltage - 110VAC 3A, 60Hz; 230VAC 2A, 50Hz
Gas	Methane gas up to 2l/min flow rate
Air	Compressed air up to 15l/min flow rate
Extraction	A fume chamber or proprietary extraction system is recommended

Unrivalled Experience in Design and Manufacturing

FTT's site in East Grinstead, is home to the largest group of fire scientists and instrumentation design engineers working on fire testing instrumentation, and is at the heart of our design and manufacturing. For more than 30 years FTT has provided the highest quality instruments and service for fire testing and research professionals worldwide, directly and through its extensive global sales and support network.



Quality

- World-class manufacturing in accordance with multiple international and national standards, including: EN, ISO & ASTM
- ISO 9001, ISO 14001 certified

Integrity

- A dedicated team passionate about fire testing instrumentation and continuous product improvement
- Delivering reliable, robust and easy-to-use instruments for the past 30 years

Excellence

- A world-class team made up of qualified fire scientists, mechanical, electrical and electronic fire instrument design engineers and production, installation and maintenance engineers

Global

- World-wide distribution network for global sales, installations, training, maintenance and technical support
- Leading global supplier of the Cone Calorimeter, Large Scale Calorimeter, NBS Smoke Chamber and Oxygen Index