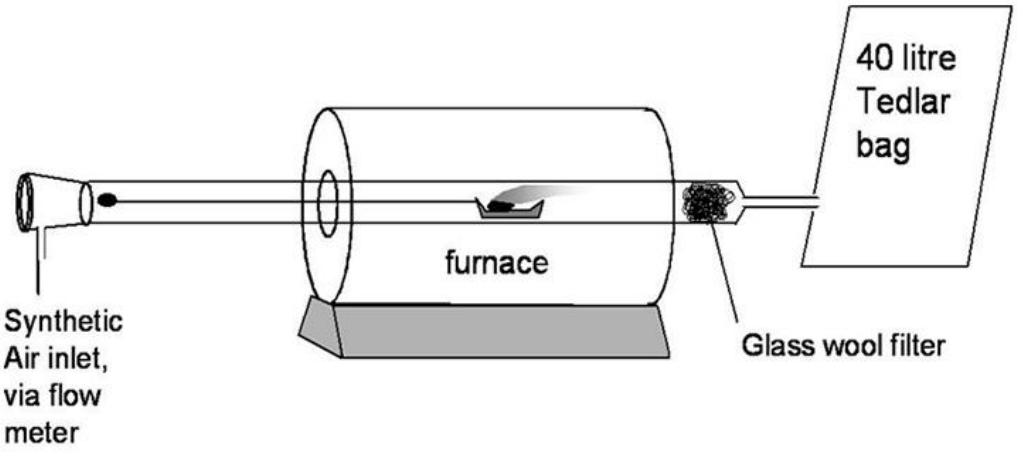
FRENCH RAILWAY TEST (NF X 70-100, AND PREN 45545-2)

A SIMPLE TOXICITY STANDARD ADOPTED BY THE EUROPEAN RAILWAY INDUSTRY.

The static tube furnace has been incorporated into a number of standard methods for assessment of toxic or corrosive products during decomposition or combustion. It can be used with different gas collecting and analytical systems to determine various hazards. The determination of specified fire gases is carried out using specified conditions of temperature, air flow and gas sampling according to NFX 70-100, generating a fire smoke toxicity index (TI). This is used by mainland Europe for certain materials, and in the UK for small items used in railway vehicles.

The NF X 70-100 method was developed to estimate the toxicity of materials and products used in railway vehicles, initially in France. This is a small scale static tube furnace in which the test specimen (typically 1 gram or 0.1g for low density materials), is pushed, in a crucible, into the middle of the furnace tube and thermally decomposed, using furnace temperatures of 400, 600 and 800°C to represent oxidative pyrolysis, well-ventilated and under-ventilated conditions in flowing air at 2 litres min-1, where they may pyrolyse and auto-ignite. For most materials at a temperature of 400°C they will not ignite, so the condition is oxidative pyrolysis. At a temperature of 600°C, the rate of pyrolysis may be fairly slow, giving a well-ventilated fire condition, whereas at 800°C the fire condition may be closer to under-ventilated as the rate of pyrolysis exceeds the stoichiometric air supply rate. The effluent is driven through gas detection systems, bags or bubblers for subsequent analysis.



This method is easy to use, uses simple equipment with specified operating conditions of temperature and air flow. It is increasingly used for fire toxicity testing of materials used for railway vehicles and is also included in prEN45545-2. The lack of requirement for flaming to be observed

leaves the assignation of well-ventilated flaming to be assumed for most materials at 600°C and fully developed flaming for materials at 800°C.