Australian Standard®

Combustion characteristics of plastics

Method 1: Determination of flame propagation—Surface ignition of vertically oriented specimens of cellular plastics

PREFACE

This Standard was prepared by the Standards Australia Committee on Fire Tests for Plastics under the authority of the Multitechnics Standards Policy Board, to revise AS 2122.1—1978, *Combustion propagation characteristics of plastics*, Part 1: *Determination of flame propagation following surface ignition of vertically oriented specimens of cellular plastics*. In this revision, the Standard has been reformatted, the test specimen size has been changed, tolerances on the gas and air inlet pressures are added, a maximum airflow of 0.2 m/s through the test hood is specified and the burner arrangement (Figure 2) has been redrawn. Other Standards in the AS 2122 series dealing with combustion characteristics of plastics are:

AS
2122 Combustion characteristics of plastics
2122.2 Method 2: Determination of minimum oxygen concentration for flame propagation following top surface ignition of vertically oriented specimens
2122.3 Method 3: Determination of smoke-release—Cellular polyurethanes and polyisocyanurates

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

CONTENTS

FOREWORD

In the preparation of this Australian Standard, ISO 1210—1992, *Plastics—Determination of the burning behaviour of horizontal and vertical specimens in contact with a small-flame ignition source*, and ISO 3582—1978, *Cellular plastic and rubber material—Laboratory method of test to assess horizontal burning characteristics when subjected to a small flame*, were considered, and other tests which use horizontal specimen orientation were investigated. Experience has shown that test methods using horizontal specimen orientation are not acceptable because—

(a) the low heat return to the specimen of horizontal orientation leads to benign conditions;

(b) materials which melt often retreat from the ignition source;

(c) the tests tend to be 'go' or 'no go' tests, with little or no ability to discriminate between the performance of retarded grades.

This test, which uses vertically oriented specimens, has been found useful in the quality control of materials, particularly in relation to the proof of the incorporation of flame retardants in the materials. It has also been found useful in the research and development area. Guidance on the manner in which the results of this test method may be applied is given in Appendix A.

The combustion propagation characteristics of a material are complex and a series of tests would be required to specify all combustion characteristics of a material (e.g. ignitability, flame propagation, heat release, smoke release, toxicity, and dripping behaviour). This test may be used to compare aspects of this particular combustion propagation characteristic in a series of plastics materials.

It must be stressed that this combustion characteristics test will not indicate the fire hazard of a material in actual use. It is the manner in which the material is installed and the modification and fabrication which it undergoes in the production of the final product which determine the fire hazard of the material. This test may be used to specify a combustion propagation characteristic of a raw material in a product Standard.

METHOD

1 SCOPE This Standard describes the method of test for determining flame duration and material consumed for small, vertically oriented specimens of cellular plastics of density less than 100 kg/m^3, when exposed to a small flame.

NOTE: Guidance on the manner in which the results of this method may be applied is given in Appendix A.