

Australian Standard[®]

**PLASTICS FUEL AND EMISSION
CONTROL TUBE**

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TUBING, PLASTICS (FOR FUEL LINES)]

The following scientific, industrial and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Department of Defence
Department of Transport
Chief Secretary's Office, Victoria
Department of Motor Transport, N.S.W.
Maritime Services Board of New South Wales
Plastics Institute of Australia Incorporated
Society of Automotive Engineers Australasia
National Safety Council of Australia

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CONTROL TUBE**

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PREFACE

This standard was prepared by the Association's Committee for Plastics Fuel Tube under the authority of the Plastics Standards Board. It is based on a draft submission from the Plastics Institute of Australia Incorporated. In its work the committee also took cognizance of SAE Standard No J 844D, DIN Standard 73378, and BSI Draft Standard 78/52116.

The standard contains a number of test methods which establish the suitability of a design and manufacturing process to produce acceptable plastics tube for fuel and emission control lines in all types of fuel-burning engines used for automotive, marine, industrial, agricultural and domestic purposes.

Attention should be paid to preventive measures, such as in the design of the fuel tube, its installation, or the location of the fuel pump, to minimize any possible fire hazard; in the current state of fuel tube technology, all unprotected plastics fuel lines fail any realistic fire test situation, and hence no fire tests have been included in this standard at this time.

Appendix A sets out the recommended practice for the installation of both plastics fuel and plastics emission control tube.

The committee recognized that, in addition to the tube properties specified herein, the tube also requires high abrasion resistance, good dimensional stability, minimum creep under stress, and high fatigue resistance. Requirements and methods of test for these additional properties will be included when the relevant information becomes available.

This standard may require reference to the following Australian standards:

AS 1349 Bourdon Tube Pressure and Vacuum Gauges

AS 1369 Method for the Determination of the Deflection Temperature of Plastics Subjected to an Applied Stress

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard Specification
for
PLASTICS FUEL AND EMISSION CONTROL TUBE

1 SCOPE. This specification sets out requirements for plastics tube from 5 mm to 12 mm outside diameter, designed for use as fuel and emission control lines for all types of engines using the following fuels: motor spirit, automotive diesel fuel or distillate, two-stroke engine fuel, lighting or power kerosene.

This specification does not cover fittings used with fuel or emission control tube.

2 APPLICATION. The tubes covered by this specification are intended for automotive, marine, industrial, agricultural and domestic uses.

The lines are not intended for use with special motor racing fuels or those containing nitrobenzene, or for fuel lines in shipping subject to Lloyd's register.

They should not be used for fuel supply to domestic oil-heating devices, or with liquefied petroleum gas.

Recommendations for the installation of the tubes are given in Appendix A.

3 DEFINITIONS. For the purposes of this specification the following definitions apply:

Motor spirit—a mixture of volatile hydrocarbons suitable for the operation of spark-ignition internal combustion engines.

Two-stroke engine fuel—a blend of motor spirit and special two-stroke engine lubricant suitable for use with spark-ignition two-stroke internal combustion engines.

Kerosene—distilled hydrocarbons which have been refined into—

- (a) lighting kerosene (low aromatics), and
- (b) power kerosene (high aromatics).

Distillate (gas oil)—distilled hydrocarbons suitable for use in high-speed compression-ignition internal combustion engines.

Diesel oil—a mixture of distillate and residue producing a fuel for low-speed and medium-speed compression-ignition engines.

4 CLASSIFICATION. Plastics fuel and emission control tube shall be classified as Class 1 flexible or Class 2 rigid, according to its minimum bend radius as given in Table 1. The minimum bend radius shall be determined in accordance with Appendix B.

TABLE 1
MINIMUM BEND RADII OF TUBE

Nominal outside diameter	Minimum bend radius	
	Class 1 flexible	Class 2 rigid
5	25	40
6	38	48
8	45	61
10	50	80
12	60	96

5 MATERIAL. Plastics fuel and emission control tube shall be manufactured from virgin plastics material of minimum heat distortion temperature of 140°C determined in accordance with AS 1369 at a fibre stress of 0.45 MPa.

The material shall not contain any plasticizer which, when extracted, has a deleterious effect on the fuel or associated equipment.

Core reinforcement with high tensile yarn or equivalent material may be incorporated in the tube. Such reinforcement shall not be affected by corrosion, rot, mildew or by the fuel.

6 COLOUR. Plastics fuel and emission control tube shall be coloured black. Yellow shall be used for printing or markings on tube to be used for fuel lines, and a dissimilar colour shall be used on tube for emission control functions.

7 WORKMANSHIP. The inner and outer surfaces of the tube should exhibit high gloss and be free from visible surface defects. The material should be homogeneous throughout and any reinforcement should be concentrically located within the tube wall.

8 DIMENSIONS AND TOLERANCES. The tube shall conform to the dimensions and tolerances specified in Table 2. Ovality shall not exceed 5 percent of the nominal outside diameter.

TABLE 2
DIMENSIONS

Nominal outside diameter	Outside diameter	Minimum wall thickness for Classes 1 and 2
5	5 ± 0.08	0.85
6	6 ± 0.08	1.0
8	8 ± 0.08	1.4
10	10 ± 0.08	1.7
12	12 ± 0.08	2.0

9 CONDITIONING. All test specimens shall be conditioned in accordance with the method described in Appendix C. The mass loss for any test specimen shall not exceed 2 percent.

10 PROPERTIES. Fuel and emission control tube shall be subjected to the tests listed in Table 3 and shall comply with the criteria given therein.

11 MARKING. All plastics fuel and emission control tube shall be legibly and indelibly marked with the following information at intervals not exceeding 450 mm; embossed branding shall not be used:

- (i) Fuel tube or emission control tube, as applicable.
- (ii) Manufacturer's name and/or registered trademark.