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Australian Standard 2108—1977

ANTIFREEZE COMPOUNDS AND CORROSION INHIBITORS FOR ENGINE COOLING SYSTEMS

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THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Automobile Association

Australian Institute of Petroleum

Federal Chamber of Automotive Industries

Federation of Automotive Products Manufacturers

Institute of Petroleum

Manufacturers of antifreezes and corrosion inhibitors

Royal Australian Chemical Institute

Society of Automotive Engineers - Australia

CH/29

This standard, prepared by Committee ~~AU/24~~, Antifreeze Solutions, was approved on behalf of the Council of the Standards Association of Australia on 31 October 1977, and was published on 1 December 1977.

To keep abreast of progress in industry, Australian standards are regularly reviewed. Suggestions for improvements to published standards, addressed to the head office of the Association, are welcomed.

This standard was issued in draft form for public review as DR 77005.

AUSTRALIAN STANDARD SPECIFICATION

ANTIFREEZE COMPOUNDS AND CORROSION INHIBITORS FOR ENGINE COOLING SYSTEMS

AS 2108—1977

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PREFACE

This standard was prepared by the Association's Committee on Antifreeze Solutions.

The requirement arose from a need for a performance standard covering antifreeze compounds generally. Such a standard was not available in Australia or overseas. All available standards either refer to specific materials or cover test methods only without criteria. It was felt that a general performance standard would assist in reducing the number of different types of antifreeze compounds on the market, and be of help to both the vehicle manufacturer and the consumer.

The difficulty in writing a general performance standard for an antifreeze compound arises from the fact that there is no strict correlation between laboratory and field tests for these compounds, and because optimum requirements may vary between engine makes and types of cooling systems, and for different service conditions. However, it was felt that it should be possible to produce a specification which would be suitable for most engines within reasonable limits.

It was decided to include corrosion inhibitors in the standard because these are an essential part of antifreeze compounds, and because some motorists under Australian conditions change from antifreeze compounds in winter to corrosion inhibitors in summer.

Because of the difficulty in obtaining correlation between laboratory and field tests, BS 5117, Methods of Test for Corrosion Inhibition Performance of Antifreeze Solutions, includes rig, static engine and field tests in addition to glassware corrosion tests. The committee, however, were of the opinion that the limited Australian market for antifreeze compounds did not warrant this extensive range of tests. It was considered that the only corrosion test which could be economically justified for Australian conditions was the glassware corrosion test. It was accordingly decided to limit the standard to this test, leaving individual vehicle or engine manufacturers with general test facilities to carry out additional tests should they consider this either necessary or desirable to qualify a product for their own vehicles or engines.

The standard accordingly provides the basic requirements for inhibited antifreeze compounds and corrosion inhibitors for Australian conditions. In this respect it serves a similar purpose to U.S. Federal Specification O-A-584D Antifreeze Coolant: Ethylene Glycol, Inhibited, Concentrated, in respect of performance requirements, but without any limitation on materials.

The standard refers to BS 5117 in regard to any further tests which the vehicle or engine manufacturer may wish to carry out. It is expected that performance criteria covering all of the tests included in BS 5117 will be made available by the British Standards Institution at a later date.

This standard requires reference to the following standards and test methods:

BS 5117	Methods of Test for Corrosion Inhibition Performance of Antifreeze Solutions
SAE J20e	Coolant System Hoses
ASTM D92	Test Method for Flash and Fire Points by Cleveland Open Cup
ASTM D1120	Test Method for Boiling Point of Engine Antifreezes
ASTM D1121	Test Method for Reserve Alkalinity of Engine Antifreezes, Antirusts and Coolants
ASTM D1177	Test Method for Freezing Point of Aqueous Engine Antifreeze Solutions
ASTM D1287	Test Method for pH of Engine Antifreezes, Antirusts, and Coolants
ASTM D1384	Method for Corrosion Test for Engine Coolants in Glassware
ASTM D1881	Test Method for Foaming Tendencies of Engine Coolants in Glassware
ASTM D1882	Test Method for Effect of Antifreeze and Cooling System Chemical Solutions on Organic Finishes for Automotive Vehicles.

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Australian Standard Specification for ANTIFREEZE COMPOUNDS AND CORROSION INHIBITORS FOR ENGINE COOLING SYSTEMS

1 SCOPE. This specification sets out the basic performance requirements for antifreeze compounds and corrosion inhibitors for use in engine cooling systems of motor vehicles and stationary engines under Australian climatic conditions.

The specification applies to concentrates which require dilution before use, and to solutions which are formulated for direct use in the engine cooling system.

The antifreeze compounds, when added to water in the recommended proportions, are intended to depress the freezing point to −12°C or lower, and to provide the necessary protection against corrosion of metals and deterioration of coolant hoses.

Corrosion protection is provided in respect of the metals normally found in an engine cooling system, viz copper, solder, brass, steel, cast iron and cast aluminium alloy.

2 APPLICATION. The antifreeze compound or corrosion inhibitor is intended for use in all types of water-cooled engines.

In some cases a product to a different specification may be recommended by the engine manufacturer, and in these cases the engine manufacturer's recommendation should be followed.

If engine manufacturers require further tests to qualify a product to this specification for a particular engine, it is recommended that these tests be conducted in accordance with BS 5117*, using test coupons to ASTM D1384.†

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

Antifreeze compound—a compound which when added to water depresses the freezing point, raises the boiling point, and inhibits corrosion of the metals normally found in an engine cooling system; or is formulated to achieve the same effect without dilution.

*BS 5117, Methods of Test for Corrosion Inhibition Performance of Antifreeze Solutions.
†ASTM D1384, Method for Corrosion Test for Engine Coolants in Glassware.