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SPIRIT LEVELS FOR USE IN PRECISION ENGINEERING

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Associated Chambers of Manufactures of Australia

Department of Defence

Department of Productivity

Federal Chamber of Automotive Industries

Institution of Engineers, Australia

Institution of Production Engineers

Metal Trades Industry Association of Australia

National Measurement Laboratory

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PREFACE

This standard was prepared by the Association's Committee on Metrology as part of its program of providing a rational range of specifications for measuring instruments in metric units. It supersedes AS B135—1955. Precision Levels for Engineering Workshops, which was the endorsement of BS 958: 1941.

Currently there is no international agreement on this subject within ISO/TC 3, Dimensional Metrology, nor does any appear likely in the forseeable future. With this in mind, the committee took into account practices specified in BS 958:1968, Spirit Levels for Use in Precision Engineering.

Spirit levels have become generally accepted as tools for use in precision engineering, and recognition of the fact that they provide a quick and accurate means of checking surfaces for flatness, alignment, etc is reflected in Australian standards dealing with precision measuring equipment such as surface plates and straightedges. This fact has also been recognized in the ISO international standards dealing with methods of testing the accuracy of machine tools.

One of the main purposes in preparing this standard is to take into account the publication of AS 1983, Spirit Level Vials. The requirements for accuracy of performance are based on that standard and relevant definitions are also included to help ensure that these requirements are correctly interpreted.

Attention is drawn to the fact that levels may be tested for compliance with this standard by laboratories registered with the National Association of Testing Authorities (NATA) for the class and field of testing.

In accordance with the practice adopted in AS 1100, Drawing Practice, the decimal comma has been used in this standard.

This standard may require reference to the following Australian and British standards:

AS 1983	Spirit Level Vials
AS B140	Micrometer Heads
AS Z33	Glossary of Terms Relating to the Performance of Measuring Instruments
BS 1133	Packaging Code: Section 6: Temporary Protection of Metal Surfaces against Corrosion (during transport and storage)

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard Specification

for

SPIRIT LEVELS FOR USE IN PRECISION ENGINEERING

1 SCOPE. This standard specifies requirements for spirit levels for use in precision engineering.

Although this standard deals specifically with spirit levels, it recognizes that levels operating on other principles perform a similar function, and it is recommended that such instruments should conform to the same general requirements for accuracy and performance of spirit levels, where applicable.

2 TYPES. Three types of spirit levels are specified, as follows:

Type 1—a spirit level with an unrelieved flat base of steel hardened and lapped.

This type of level is usually made with base lengths of between 100 mm and 200 mm. The advantage of the lapped base is that the base length of the level can be varied at will by wringing two gauge blocks on to the base at the required distance apart.

Type 2—a spirit level, mounted in a body usually of cast iron or steel, and having a base formed with flat bearing surfaces at the two ends, i.e. the middle portion is relieved.

The bearing surfaces may either be plain or contain a longitudinal 120 degree V-groove for use on cylindrical surfaces. In the latter case, a short cross-level or small circular level is provided.

This type of level is usually made with base lengths of between 250 mm and 500 mm.

Type 3—a square block level, usually of cast iron, and about 200 mm square.

The four bearing surfaces are flat and may have the middle portions relieved; alternatively, the base and one adjacent surface may each contain a longitudinal 120 degree V-groove for use on cylindrical surfaces. In the latter case, a short cross-level is provided.

3 NOMENCLATURE AND DEFINITIONS.

3.1 Nomenclature. For the purposes of this standard, the nomenclature given in Figs 1 to 3 applies.