

Specification for

Magnetic flaw detection inks and powders

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Foreword

The preparation of BS 6072 indicated that it would be opportune to up-date the British Standard for magnetic flaw detection inks and powders. This revision of BS 4069 has been prepared under the direction of the Mechanical Engineering Standards Committee and due account accordingly has been taken of developments in the composition, functional testing and packaging of these products since the standard was first issued in 1966. In particular, improved apparatus for determining the solids content and general condition of magnetic inks and for carrying out functioning tests on both inks and powders has been introduced. This British Standard supersedes BS 4069:1966, which is withdrawn.

Although this standard specifies requirements for inks and powders, it should not be inferred that their composition does not require adjustment within the limits specified in order to render them more suitable for particular applications, and in such instances the recommendations of the manufacturer should be followed.

As is emphasized in BS 6072, the effectiveness of magnetic particle inspection rests on the technical competence of the personnel employed on such work and their ability to interpret the indications given by the various techniques.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies the requirements for non-fluorescent and fluorescent inks, concentrates and powders used in magnetic particle flaw detection techniques. The methods of test by which the acceptability of these materials can be assessed are given in the appendices. Requirements are also given for the packaging of magnetic inks in aerosol containers.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard, the terms and definitions given in BS 3683-2 apply.

3 Composition

3.1 Magnetic inks. Non-fluorescent and fluorescent inks, whether supplied ready for use or made-up from concentrates, shall consist of finely divided ferromagnetic particles and a suitable carrier liquid. They shall form a uniform suspension when agitated.

The composition of non-fluorescent and fluorescent inks, shall be as follows.

a) *Ferromagnetic particles* (including adherent non-magnetic pigments):

non-fluorescent inks:	not less than 1.25 % and not more than 3.5 % by volume;
fluorescent inks:	not less than 0.1 % and not more than 0.3 % by volume.

b) *Other solid constituents* (if present):

non-fluorescent inks fluorescent inks	} not more than 10 % by mass of the ferromagnetic content.
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c) *Carrier fluid* shall represent the remainder.

NOTE Certain other constituents and soluble additives may be introduced at the discretion of the manufacturer.

Inks shall not contain any constituents that are generally recognized or known to be likely to cause injury or discomfort to operators during or after use.

Inks shall not corrode steel or otherwise adversely affect the component under test.

3.2 Concentrates. Inks prepared from concentrates and diluted with the appropriate carrier fluid in accordance with the manufacturer's instructions shall comply with 3.1.

3.3 Powders. Powders shall consist of finely divided ferromagnetic particles.

NOTE Certain other constituents may be present at the discretion of the manufacturer.

Powders shall not contain any constituents that are generally recognized or known to be likely to cause injury or discomfort to operators during or after use.

4 Materials

4.1 Ferromagnetic particles with other solid constituents

4.1.1 Inks. The particle size of ferromagnetic particles and any other solid constituents in inks, shall be such that, in at least 99 % of a representative sample, no particle shall exceed 100 µm in size.

4.1.2 Powders. The particle size of ferromagnetic particles and any other solid constituents in powders, shall be such that, in at least 99 % of a representative sample, no particle shall exceed 200 µm in size.

4.2 Carrier fluid. The flash point of the carrier fluid shall be not less than 65 °C, as determined by the Pensky-Martens closed cup test (see BS 2839).

NOTE In order to support magnetic particles in a water base, it is necessary to have additives that will enable this to be achieved but which may impair other functions of the carrier fluid, such as wetting the surface and protecting against corrosion.

5 Tests

When tested in accordance with the method described in A.1 the total solids content in inks shall be as specified in 3.1 a) and b).

NOTE 1 Tests, for the user, to check the solids content of inks prior to and during use, and a special test for fluorescent inks are described in A.2, A.3 and A.4.

NOTE 2 It is strongly recommended that, every working period before commencing testing, operators carry out a functioning test in accordance with appendix B. When one of the functioning tests described in appendix B is carried out the appropriate acceptance criterion should be met. If the test is not satisfactory, corrections should be made to the ink or powder prior to testing the components.

When ink is tested in accordance with the method described in appendix C, the steel bar shall not exhibit any evidence of corrosion or chemical attack.

6 Aerosol packaging of magnetic inks

NOTE Both coloured and fluorescent magnetic inks may be supplied in aerosol containers using appropriate propellants, valves and actuators, at the manufacturer's discretion.

All aerosol containers of magnetic ink shall contain a glass ball or other effective aid to agitation.