

Materials used for the control of liquid spillages —

Part 1: Determination of sorbency

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- AEA Technology
- British Oils Spill Control Association
- British Safety Industry Federation
- Chemical Industries Association
- Environment Agency
- Fire Service College
- Personal Safety Manufacturer's Association

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Foreword

This British Standard has been prepared by Technical Committee CII/63, Chemical spill control.

BS 7959-1 gives test methods used for the control of spilled liquids. These materials, which are generically known as “sorbents”, include those which act by adsorption, absorption and gelling. The test methods generally apply to sorbents of all types, which allows user to make reliable comparisons between materials of different types for specific applications.

BS 7959-2 gives a method for the determination of water repellency (buoyancy) for hydrophobic materials.

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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.

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Introduction

Good working practices should ensure that liquid spills are prevented. However when these do occur there are many ways in which a liquid spill may be controlled. These include prevention by the use of safe working practices, physical containment either at source or later after the liquid has spread, and removal of the liquid.

Removal may be accomplished using several different techniques, such as purely mechanical (pumps, skimmers, separators), washdown (where permitted) with solvents or detergents, and the use of materials which immobilize the liquid into a form rendered suitable for physical lift-up. It is these latter materials which form the subject of this standard. Traditionally these materials have come to be known by the term “sorbents” and this term has been adopted for the purposes of the standard.

Sorbent materials carry out the process of fixing spilt liquids in different ways, of which the following have been clearly identified.

- a) Adsorption is a surface process whereby capillary attraction holds the liquid on the external surface of the adsorbent material, and in the void spaces formed by the intrinsic structure of the material.
- b) Absorption is a process whereby a swellable polymer partially (but not completely) dissolves in the liquid by taking the liquid into the polymer structure. In the process individual particles of polymer swell but do not dissolve completely or coalesce, being usually constrained by cross-linking.
- c) Gelling is a process whereby usually a soluble material dissolves in a liquid forming a very viscous, continuous solution which takes on a solid form allowing physical removal. The same effect is sometimes achieved using insoluble materials such as clays.

Although the materials and processes described above are essentially very different the principal aim of their use is to immobilize and facilitate physical lift-up of the spilled liquid. This part of BS 7959 covers methods of test to determine how much liquid may be picked up by a sorbent material. The word sorbency is used to describe this property. The user of these materials may want to compare and verify supplier's claims for sorbency, therefore a common test methodology is given for sorbents of all types. This allows the user to make reliable comparisons between materials of different types. The test method for the determination of swell ratio allows the difference between an adsorbent and the other types of sorbent material to be readily distinguished.

The tests are not restricted to specific named liquids. Users of sorbent materials have a wide variety of liquid applications and are free to specify any liquid

to the suppliers of the material. A material can therefore be tested for a user's specific application. However, it is recognized that there are some circumstances, such as oil spill clean-up, where, owing to known patterns of use, it may be possible to adopt a common test liquid; this could be the subject of a future standard.

1 Scope

This part of BS 7959 describes methods of sampling and determining the sorbency of materials used for the control of liquid spillages.

A variety of materials of different composition and format is used in this application and for the purposes of this standard the following categories are used.

Type I	web type	sheet, pad or roll
Type II	loose material	discrete particles of variable size
Type III	filled products	socks, booms, pillows, cushions
Type IV	agglomerates	masses of strands for pick-up of viscous liquids

The methods are applicable to:

- a) any liquid, aqueous/miscible with water or non-aqueous/immiscible with water;
- b) sorbent materials of any type.

The standard also includes a test which will distinguish between absorbents and adsorbents.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitutes provisions of this British Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references the latest edition of the publication referred to applies.

BS 604, *Specification for graduated glass measuring cylinders*.

3 Terms and definitions

For the purposes of this part of BS 7959 the following terms and definitions apply.

3.1

adsorption

process where the liquid is held on the surface of the material

NOTE This process generally limits the volume of liquid which can be adsorbed to the free volume of the adsorbent, except in the case of high viscosity liquids where the volume of liquid adsorbed is increased by liquid clinging to the surface.