

Safety of electrical motor-operated industrial and commercial cleaning appliances —

Part 2: Particular requirements —

**Section 2.2 Specification for vacuum
cleaners, wet and/or dry**

UDC 614.825:621.313:648.5.022.3

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Light Electrical Engineering Standards Committee (LEL/-) to Technical Committee LEL/161, upon which the following bodies were represented:

Association of Control Manufacturers — TACMA (BEAMA Ltd.)	Electric Cable Makers' Confederation
Association of Manufacturers of Domestic Electrical Appliances	Electrical Association for Women
British Electrotechnical Approvals Board	Electrical Installation Equipment Manufacturers Association (BEAMA Ltd.)
British Gas Corporation	Electricity Supply Industry in England and Wales
British Lawn Mower Manufacturers' Federation	Fire Protection Association
British Retailers' Association	Home Office
Catering Equipment Manufacturers' Association	Institution of Electrical Engineers
Consumer Standards Advisory Committee of BSI	Lighting Industry Federation Ltd.
Consumers' Association	Ministry of Defence
Department of Energy (Electricity Division)	Portable Electric Tool Manufacturers' Association
Department of Trade and Industry (Consumer Safety Unit, CS Division)	Rotating Electrical Machines Association (BEAMA Ltd.)
ERA Technology Ltd.	Small Electrical Appliances Marketing Association
Economic Development Council	South of Scotland Electricity Board

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

Asbestos Removal Contractors' Association	Industrial Cleaning Machine Manufacturers' Association (BEAMA Ltd.)
Association of High Pressure Water Jetting Contractors	Scottish Health Services
Department of Health and Social Security	
Health and Safety Executive	

This British Standard, having been prepared under the direction of the Light Electrical Engineering Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 October 1986

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First published November 1976
First revision October 1986

The following BSI references relate to the work on this standard:
Committee reference LEL/161
Draft for comment 85/21927 DC

ISBN 0 580 15237 5

Amendments issued since publication

Amd. No.	Date of issue	Comments
6451	December 1990	Indicated by a sideline in the margin

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Foreword

This Section of BS 5415-2 has been prepared under the direction of the Light Electrical Engineering Standards Committee. It is a revision of BS 5415-2.2:1976, which is withdrawn.

BS 5415-2.2 is one of a number of Sections that specify requirements for particular industrial and commercial floor cleaning appliances. It should be read in conjunction with BS 5415-1, which it confirms, departs from, adds to or modifies.

To facilitate reference to BS 5415-1 this Section has the same clause, subclause and figure numbering and the same appendix lettering as that Part. Additional subclauses particular to this Section are numbered with the main clause number, followed by .101, .102, etc. Additional appendices are lettered AA and BB.

Attention is drawn to Supplement No. 1 (1986) to this Section of BS 5415. This Supplement specifies the additional requirements for type H industrial vacuum cleaners suitable for the collection of non-explodable ducts hazardous to health. It should be read in conjunction with both BS 5415-1 and BS 5415-2.2.

The foreword of BS 5415-1 should be read in regard to the following: Part 1's suitability for use in work activities to which the provisions of Health and Safety at Work etc. Acts apply; compliance with Electrical Equipment (Safety) Regulations; and enablement of the granting of certification for innovative products.

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.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, 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.

NOTE It is essential that this Section of BS 5415-2 be read in conjunction with BS 5415-1:1985.

1 Scope

1.1 This Section of BS 5415-2 specifies requirements for the safety of electrical motor-operated vacuum cleaners for industrial or commercial use, and includes appliances specifically designed for wet suction, dry suction or wet/dry suction, with or without attachments.

This Section does not take into account the special hazards that exist in nurseries and other places where there are young children or aged or infirm persons without supervision; in such cases additional requirements may be necessary.

This Section does not apply to:

- a) appliances designed exclusively for household use;
- b) appliances intended to be used in tropical countries;
- c) appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas).

1.2 This Section is concerned with safety and takes into account the influence on safety of components that are necessary to achieve the required degree of radio and television interference suppression.

NOTE 1 The special requirements for vacuum cleaners for dusts hazardous to health are specified in Supplement No. 1 to this Section.

NOTE 2 Appendix AA covers aspects of performance and design for vacuum cleaners for use in hospitals and hospital or healthcare related institutions. The items covered are outside the scope of this Section but they may be specified by hospital authorities in contracts.

NOTE 3 Industrial/commercial uses are to be found, for example, in shops, offices, hotels, schools, hospitals and factories.

NOTE 4 Attachments include electrical power driven brushes and power discharge pumps.

NOTE 5 The titles of the publications referred to in this Section of BS 5415-2 are listed on the inside back cover.

2 Definitions

For the purposes of this Section of BS 5415-2 the definitions given in BS 5415-1:1985 apply with the following modification and addition.

To 2.2.30, this definition being replaced by the following.

2.2.30

normal load

the load obtained when the appliance is operated continuously with the air inlet adjusted to give an input, P_m , is calculated from the equation:

$$P_m = 0.5 (P_f + P_i)$$

where

P_f is the input (in W) when the appliance has been on circuit for 3 min with the air inlet wide open, any valve or similar device used to ensure a flow of air to cool the motor in the event of a blockage of the main air inlet being allowed to operate in the normal way.

P_i is the input (in W) when the appliance has been on circuit for 20 s, with the air inlet sealed immediately following the period with the air inlet open, any valve or similar device used to ensure a flow of air to cool the motor in the event of a blockage of a main air inlet being rendered ineffective.

P_f and P_i are measured when the supply voltage is adjusted to the rated voltage, or to the voltage equal to the mean value of the voltage range if the difference between the limits of the rated voltage range does not exceed 10 % of the mean value of the range. If the difference between the limits of the rated voltage range exceeds 10 % of the mean value of the range, the tests are carried out with the supply voltage adjusted to the upper limit of that range

the measurements are made with the appliance fitted with a clean dust bag and filter and with the water container, if any, empty. If the appliance is intended for use only with a hose, detachable nozzles are removed and the hose is laid out straight. If the appliance is provided with a hose as an optional fitting, it is operated without the hose rotating brushes and similar cleaning devices, if any, are in operation but are not in contact with the floor or any other surface or with the means used to seal the air inlet

the adjustment of the air inlet is not altered when it is specified that the appliance is to be operated on normal load, irrespective of the supply voltage specified in the test. Where optional filtration systems are supplied with the vacuum cleaner, the filtration system giving the least air resistance (maximum flow) is fitted

the normal load for motors used solely for driving a rotating brush or similar cleaning device is determined after the measurement and calculation of P_f and P_i . The air inlet is adjusted to give P_f , the rotating brushes or similar cleaning device not being in contact with the floor or any other surface

NOTE 1 The motors for both brushes and air flow operate together.

NOTE 2 The carpet is as specified in Appendix AA of BS 5415-2.1:1986.

NOTE 3 The motor responsible for the air flow operates under the same conditions as the appliance in the definition for P_f , i.e. no air flow restrictions.

NOTE 4 The brush is adjusted for carpet pile height to the carpet setting recommended by the manufacturer.