



A Guide to the Selection of Vacuum Cleaners

ICMMA PUBLICATION 009

Issue 1: August 2006

<http://www.icmma.org.uk/pub/009.1.pdf>

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<i>Issue Number</i>	<i>Date of Issue</i>	<i>Reason for Change</i>
001	August 2006	New document

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1 Introduction

This document is intended to cover the Operating Characteristics and Performance of Commercial/Industrial Vacuum Cleaners of the Dry Tub, wet and dry tub, battery operated tub vacs and upright vacs with brush head.

The parameters covered are as follows:

- Length of cable
- Motor Power
- Air Flow
- Capacity
- Vacuum
- Weight
- Size
- Filtration
- Noise level

2 Length of Cable

Measured from base of plug to where the cable enters the appliance.

This cable, for general use should be not less than 7.5 metres long.

3 Motor Power

This shown on the appliance in two designations:

- maximum wattage
- nominal wattage

P_{max} , the maximum wattage is the theoretical maximum load capability of the motor.

P_{iec} , the actual wattage utilised when the vacuum cleaner is in use under normal operating conditions.

It is this actual wattage that is the most useful measure of the power consumed by the motor.

The motor power should not exceed the capability of the available supply (e.g. from a 230 volt, 50Hz, electricity supply the motor power should NOT exceed 3kW).

4 Air Flow

The measure of this is as significant to performance as motor power and vacuum.

Air Flow is dependant upon length and diameter of the vacuum hose and the nature of the accessory fitted to the end of the hose and the overall design of the product.

For comparative performance analyses, the air flow should be measured at the hose fitting connection at the body of the machine i.e. without hose fitted.

5 Air Wattage

Machines will often have air wattage quoted in their performance details.

It is generally recognised as being of use as a comparative measure of performance and efficiency of a particular vacuum cleaner

6 Vacuum

The vacuum measured at the end of the hose, or at the mouth of an accessory on a hose, varies from one hose length/accessory fitment to another and is not useful in comparative analyses.

The vacuum performance of a machine is best measured at the machine hose inlet, with no hose fitted and the inlet closed.

Performance of any machine is a combination of air flow, vacuum and motor power, generally in that order of significance.

7 Capacity

Capacity is always measured in litres.

This is variable dependant upon application:

Dry Vacuum Machines

If a bag is fitted, the capacity is measured by the physical capacity of the bag.

If the machine is stated as having capability for operation in a dry mode without a bag fitted, the capacity of the machine is measured by either the physical volume of the tub up to the bottom of the hose inlet connector OR up to the top of the tub container if the inlet is higher and not integrated into the tub container capacity.

Wet and Dry Vacuum Machines

When used as a dry vacuum cleaner the comments of the section 'Dry Vacuum Machines' above will apply.

When used as a wet vacuum cleaner, the wet pick-up capacity is a measure of the volume of fluid the machine is capable of collecting before the safety-cut-off device is actuated, with the machine standing on a flat surface.

This is NOT the capacity of the container

8 Weight

The statement of weight is associated with the weight of the cable and machine ONLY, i.e. excluding hose and accessories, as these can vary, dependant upon the application and affect the overall weight accordingly.

9 Filtration

Dry Vacuums

The greater the quoted surface area of filtration the longer the operating time without

the need to clean the filter.

This quoted surface area is NOT the dimensional size of the filter but the surface area of filtration material exposed to the air flow.

It should be noted that the use of a dust bag extends the operational life of the filter.

Wet Vacuums

Filtration is not normally required in a standard application where the wet material is non-hazardous.

If an application is considered by a user as 'non-standard' then specialist advice should be sought from the supplier or manufacturer.

Wet/Dry Combination Vacuums

These are vacuum cleaners that can be used in both wet and dry applications without any change of filtration method.

In this instance refer to the manufacturer's instructions to identify correct use of the machine.

NOTE:

For use outside of what might be considered typical use. A wide range of specialist vacuum cleaners are available incorporating all the necessary filtration requirements.

(Refer to ICMMA Publication 006 www.icmma.org.uk)

10 Container Size

Typically, this is the volume of that element of the vacuum cleaner construction that houses the dust collection element of the machine.

It should NOT be considered the dust capacity of the vacuum cleaner (see capacity section earlier).

11 Voltage

Before use, it should be confirmed that the rated voltage stated on the vacuum cleaner is compatible to the supply voltage of the power source.

12 Static Electricity

Certain vacuum cleaners have an anti-static feature quoted. These machines are recommended where a build up of static electricity may be expected such as when collecting very fine dust or cleaning certain textile surfaces, static electricity build up is also likely when the atmosphere is particularly dry.

13 Noise Level

Normally quoted in the unit dB(A).

Most standard vacuum cleaners operate in a range of 60-80 dB(A) or less, but such

machines, particularly when operating at less than 60 dB(A) may not have the same performance characteristics of standard vacuum cleaners due to reductions in air flow.

14 Power Tool Take Off Machine

When connected to a power supply, the combined power rating of the vacuum motor, power tool or accessory should not exceed the power supply capability.

For example: When connected to a standard 220-240v, 13 amp supply, the motor rating (watts) COMBINED with the power tool/or accessory rating (watts) should not exceed 3000 watts (3kW).

15 User Guidance Notes

All machines should comply with BS EN 60335-2-69.

This should be quoted in the manufacturers instructions.

What type of medium is being collected

Is it:

- wet
- dry
- hazardous
- combustible

This should determine the type of vacuum cleaner to be purchased.

Hazardous materials are listed in Health and Safety Publication EH40, but reference should always be made to your own Health and Safety Officer or the risk assessment associated with the locality.

Combustible Material – If in any doubt, a risk assessment with suitably qualified personnel should be undertaken as to the potential for combustion of material to be collected by the vacuum cleaner.

Specialist vacuum cleaners are available for use with both hazardous and combustible material, please refer to the ICMMA website www.icmma.org.uk, to identify suppliers of these machines.

Quantity of dirt to be collected

Consider the average volume of dirt generated per cleaning cycle to determine both the size and capacity of the equipment required.

A medium sized office, in normal use, will be suited to a vacuum cleaner with a capacity (see definition in earlier copy) of between 6 and 10 litres.

A woodworking workshop may well require a vacuum cleaner with a capacity of 50 to 100 litres (consider a risk assessment for type of vacuum cleaner to be used in this environment).

Weight of Vacuum Cleaner

The need to transport the vacuum cleaner from one location to another should be

considered in the selection of the correct machine, especially where transportation is by hand and between different floor levels.

The weight to be considered here is the weight of the vacuum cleaner when full (manufacturers specification is weight empty and without hose and accessories) and local manual handling limitations must be taken into account.

Where daytime cleaning across floors is the modus operandi, the weight of a battery powered vacuum may become critical in determining the number and location of vacuum cleaner machines required.

Where cleaning is undertaken with a back-pack vacuum cleaner then both weight of the machine and operator working time must be considered to take account of fatigue factors.

Storage

In selecting the machine to fit the application, take note of the on-site storage facilities available.

Ideally, the correct vacuum cleaner to match the cleaning task should be selected and suitable storage provided to suit the machine, not the other way around.

Application

One vacuum cleaner is rarely suitable for a multitude and variety of applications.

Before selection of a vacuum cleaner consider the following:

- Working Environment
- Number and location of power points
- Voltage load
- Floor area
- Location of waste disposal point - permissible noise levels
- Likelihood of special applications (clean rooms, hospitals etc)
- Type of flooring
- Stairway negotiation
- Required mobility over floor
- Presence of obstructions

The above list is not exhaustive but is indicative of the considerations to be evaluated before identifying the vacuum cleaner to be used.

Selection

By reference to the web site www.icmma.org.uk, a wide variety of vacuum cleaner suppliers will be identified, with products that will meet ALL requirements.