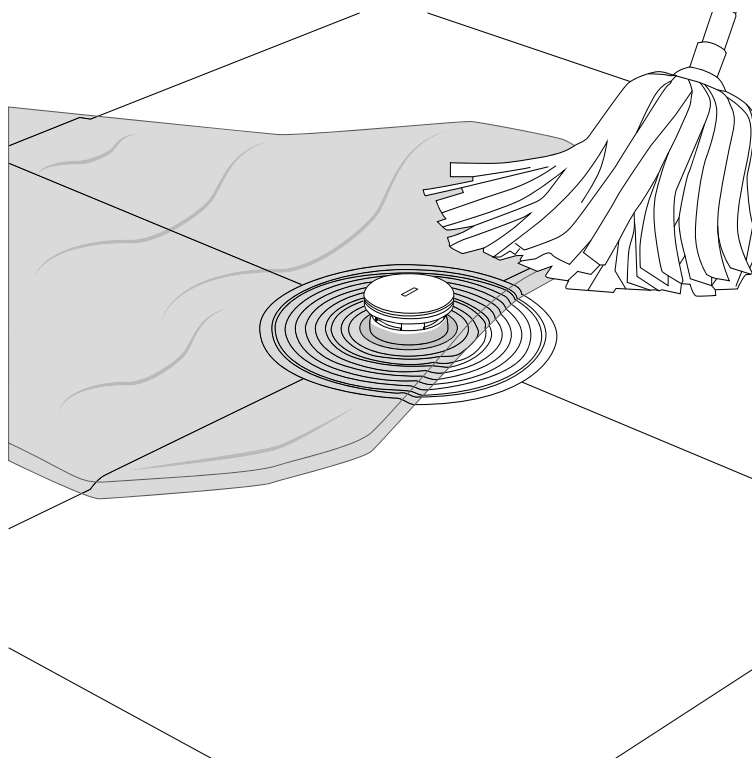


Technical information

Floor installation systems Protection class



Planning aid, taking floor coverings
into account

**Floor installation systems and
installation units**

:hager

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The contents of this document are based on the currently applicable rules and regulations as well as the current test findings of the manufacturer. No generally valid legal obligation is provided.

01 Introduction

This technical information is dedicated to the protection classes of floor installation systems. Protection classes provide information about how far the appropriate floor installation system protects the electrical resources against ingressing water and/or solid matter.

This technical information supports planners in determining the suitable floor installation system for the appropriate construction project.

02 Cleaning types according to floor material

The selection of the floor construction and floor covering determines how the floor should later be cleaned.

This can be used to make a rough estimate of the floor cleaning class.

A distinction is made between the 3 care types:

Dry cleaning

Floors to be dry-cleaned are primarily textile floor coverings, on which the dirt can be removed through suction (without or with little liquid). When using a cleaning solution, this needs to be dosed as weakly as possible, so that there is no moisture and it does not saturate the covering.



Fig 1: Carpet

Moist cleaning

Smooth floor coverings such as linoleum, PVC, laminate, parquet or polished stone floors fulfil the requirements for moist care of the covering. The building cleaning trade defines this type of floor covering as a manner of binding dust with moistened or prepared cleaning textiles.

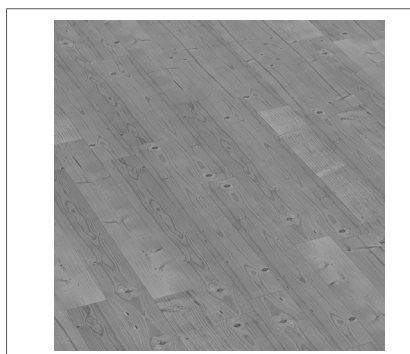


Fig 2: Parquet

Wet cleaning

Wet cleaning is primarily used with stone coverings, tiles, ceramic floors, linoleum and PVC. This type of cleaning removes particularly tough and sticky contamination.

In so doing, as much cleaning liquid is applied in the first cleaning operation with cleaning textiles as is required to soften contamination and release it.

In a second work step, this fluid is collected, together with the dirt, using cleaning textiles.

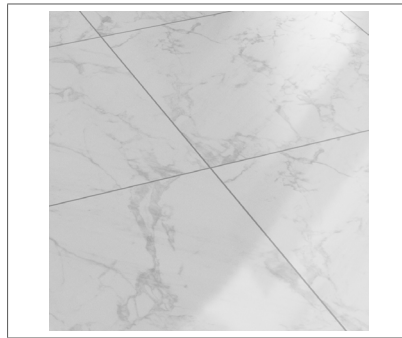


Fig 3: Tiles



Information

In the planning phase, it is wise to agree the floor characteristics in advance with the manufacturer of the floor coverings (e.g. type, cleaning interval, suitable cleaning agent).

03 Insulation test in accordance with DIN EN 50085

DIN EN 50085 defines the protection types with all the relevant specifications, which are important as protection against the ingress of solid bodies and moisture in floor installation systems.

The protection against moisture, which must be guaranteed, is orientated to the floor covering and its typical care. For this reason, the standard distinguishes between the type of floor care:

- 6.101.1 Electrical installation system for dry floor cleaning
- 6.101.2 Electrical installation system for wet floor cleaning when the service unit is not in use
- 6.101.3 Electrical installation system for wet floor cleaning when the service unit is in use

03.01 Classification of the floor installation systems by standard

6.101.1 Dry cleaning of the floor

This is the process to clean and/or care for the floor, in which methods with little or no fluids are used and the application and distribution of the cleaning and care agents takes place in such quantities that it does not need to pool formation or saturation of the floor coverings.

Examples: Sweeping with a broom or a sweeping machine, vacuuming, brushing, cleaning with a dry cleaning powder, dry foam treatment, wet shampooing of carpets, cleaning spray (chemical cleaning agents in liquid form on solid carriers, e.g. Saturated sawdust, cleaning textiles).



Fig 4: Dry cleaning of textile floor coverings

6.101.2 Wet cleaning of the floor

This is the process of cleaning and/or care for the floor, in which liquid cleaning and care agents are used, meaning that brief pool formation or saturation of the floor coverings cannot be ruled out. The connection unit is not used for this.

Examples: Wet scrubbing, manual or mechanical wiping.



Caution

Product damage through high pressure cleaning.

Excessive pressure can press dirt particles or large quantities of cleaning liquid into the sealing area of the installation units and cause long-term damage to the seals.

- Do not use cleaning vehicles or electrical high-pressure cleaning devices for cleaning.

Floor installation systems suitable for wet cleaning must repel ingressing moisture. This does not mean that they have to be waterproof or protect against continuous saturation.

Floor installation systems, declared according to 6.101.2 and 6.101.3 must have an IP code of at least IPX4 (in the unused state).

6.101.3 Wet cleaning of the floor - Addition

The same condition as for wet care according to 6.101.2 apply. In addition, splash water protection of 10 mm must be guaranteed, if the connection unit is used.

Floor installation systems declared according to 6.101.3 must ensure that no water can ingress (when used).

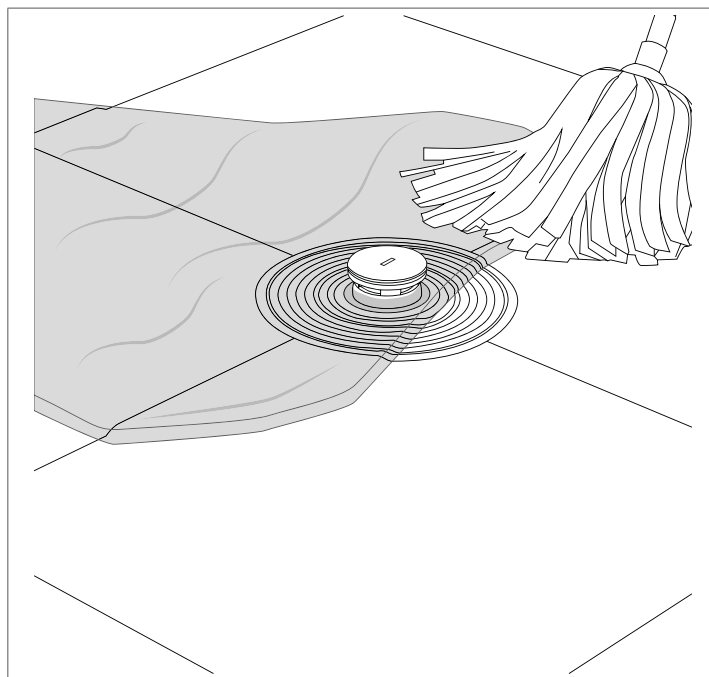


Fig 5: Wet care with 10 mm splash water protection

03.02 Protection classes and tests according to the standard

03.02.01 IP code

The protection class provides information on the ambient conditions and applications for which floor installation systems are suitable. From the classification, it is possible to read off how well the installed electrical resources offer protection against the entry of foreign bodies or liquids.

This classification is also called IP code. IP stands for International Protection, although Ingress Protection is also common. An IP code consists of code numbers, which exactly specify the protection behaviour of products when confronted with solid bodies and liquids affecting them. These code numbers are defined in the standards DIN EN 60529 and ISO 20653.

The first number of the IP code provides information on the protection against the ingress of foreign bodies. It describes the maximum size of the solid foreign bodies that could ingress. The second number relates to the protection against the ingress of liquids. It takes account of the way in which the liquid meets the product.

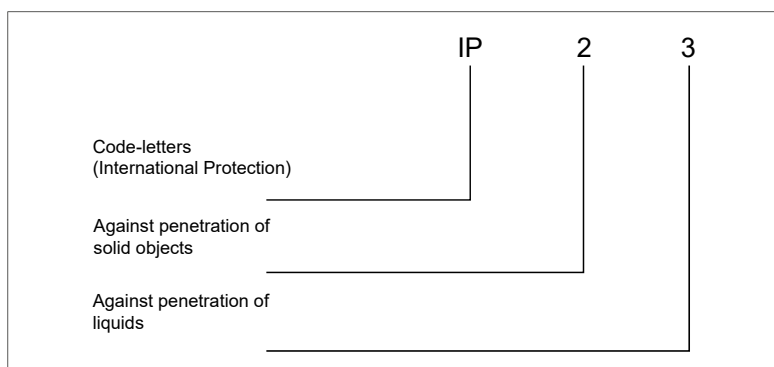


Fig 6: IP code structure

The following tables explain the meaning of possible combinations of these code numbers.

1st code number	Protection against foreign body	2nd code number	Protection against liquids
0	No protection	0	No protection
1	Foreign body with $\varnothing \geq 50$ mm	1	Water drops
2	Foreign body with $\varnothing \geq 12$ mm	2	Water drips falling at an angle of up to 15°
3	Foreign body with $\varnothing \geq 2.5$ mm	3	Water drips falling at an angle of up to 60°
4	Foreign body with $\varnothing \geq 1.0$ mm	4	Spray water from all directions
5	Dust in damaging quantities	5	Water jet from any direction
6	Dust-tight	6	Strong water jet
		7	Temporary immersion
		8	Continuous immersion (1 m water depth)
		9	Water for high-pressure cleaning

Tab 1: ID numbers and their meaning

03.02.02 Testing

The testing of the IPX4 protection rating is carried out according to DIN EN 60529.

The tester uses a swivel pipe (see Fig 7) to apply a defined quantity of water onto the test item over a defined period of time. The tests has been passed if no hazardous quantity of water has ingressed.

A formula defines this quantity. It includes the construction space of the test item and, if necessary, that of the connected system. For floor installation systems, it should also be noted that no water may flow into the socket outlets. Water is permitted to collect beneath the installed floor installation systems or in any installed cable ducts. However, this quantity of water may not be so high that it touches energised parts (e.g. the cable connection of the socket outlet).

If a higher IP protection level is required, then the intended test according to DIN EN 60529 must be carried out.

Example: IPX5 is determined through a test with a normal water jet and IPX6 through a test with a strong water jet.

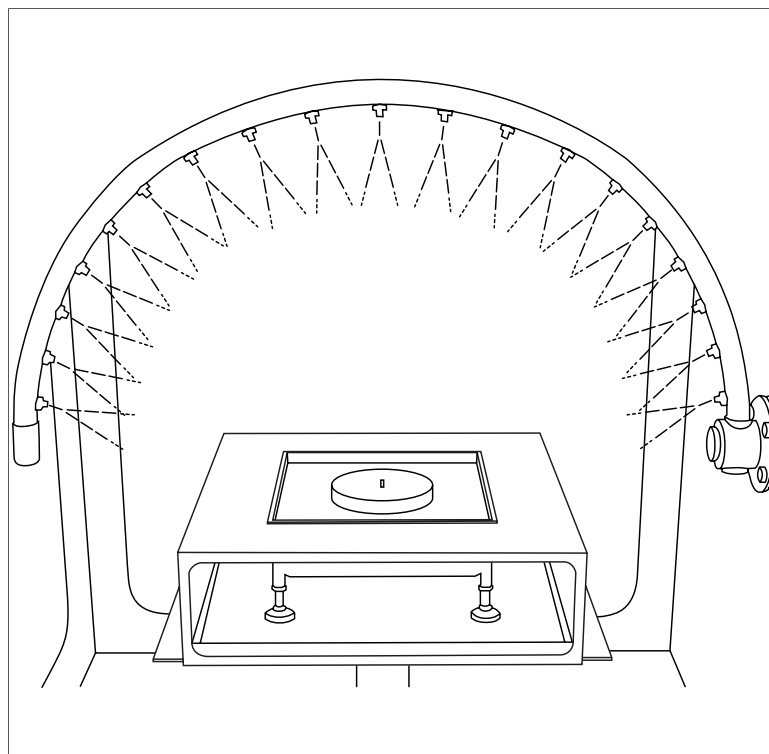


Fig 7: Testing structure in the test laboratory

04 Material compatibility



Caution

Risk of damage through caustic cleaning agents.

Contact with cleaning agents containing acids / chlorides (e.g. cement residue remover) leads to product damage.

- During basic cleaning with these cleaning agents, remove the lid during cleaning.
- Ensure that, when cleaning without a lid, no moisture enters into the frame and housing.
- If the lid is not removed, then protect all the components, including the interior, against caustic cleaning agents (e.g. through widespread masking).
- If components come into contact with caustic cleaning agents, then clean them and their seals with clear water.

Not only consultation with the floor layer is important with regard to the intended cleaning of the floor. The material compatibilities of the floor installation with the cleaning agents used must be taken into account.

The use of the wrong cleaning agent can cause serious product damage. For example, cleaning agents containing acids or chlorides can lead to corrosion on the product and the two must not come into contact under any circumstances.

Before using cleaning agents, check their compatibility with their appropriate product material (see Tab 3).

05 Product selection

How can I, as a planner, find the right installation unit for my floor installation system in the context of my construction project?

When specifying the IP protection level, the selection options are focussed on those products which are suitable for the appropriate construction project, the planned floor covering and the intended cleaning.

For example, the products VANRx, EKQx, EKRx, EKSQx and EKSRx have at least an IP classification of IP44 and can therefore be used without reservation for wet cleaning (see Tab 2).



Maintenance information

To maintain the classification:

- Install properly.
- Only clean with gentle agents according to the instructions.
- Regularly check, grease and, if necessary, replace the seals (maintenance).

Product overview	Classification according to EN 50085-1									Classification according to EN 50085-2-2		
	IP20 in use	IP20	IP30 not in use	IP30 access units	IP30	IP60 not in use	IP44 not in use	IP54 not in use	IP66 not in use	Dry cleaning of the floor	Wet cleaning of the floor	Wet cleaning of the floor - Addition
BKFD					•					•		
BKWD					•					•		
KDE	•		•	•						•		
KDQ	•		•	•						•		
BDE	•		•	•						•		
BDQ	•		•	•						•		
VANR	•								•	•	•	•
VQ/VDQ	•		•	•						•		
VR/VDR	•		•	•						•		
VE/VDE	•		•	•						•		
UDKQ06xx	•		•	•						•		
AKA					•					•		
SLA					•					•		
SL 18075					•					•		
BKB		•								•		
BKG		•								•		
EKQ / MKQ	•		• ₁					• ₄		•	• ₄	• ₃
EKR / MKR	•		• ₁					• ₄		•	• ₄	• ₃
EKSQ	•		• ₁					• ₄		•	• ₄	• ₃
EKSR	•		• ₁					• ₄		•	• ₄	• ₃
UDKQ02E	•		•							•		
UDKQxxE	•		•							•		
BSR02D01 BSR02MKxx LAR02MKxx	•					•				•		
BSR02D02 BSR02MTxx LAR02MTxx	•								•	•	•	•
BSR02D03 BSR02KKxx LAR02KKxx	•		•							•		
LAR02KBxx				•						•		

Tab 2: Classification according to EN 50085-1 and EN 50085-2-2

- ₁: With cable outlet
- ₂: With cable outlet or blanking lid
- ₃: With cone outlet
- ₄: With cone outlet or blanking lid

06 Appendix

Material compatibilities

Legend:

- N/A: No data
- A: Very good
- B: Average
- C: Less resistant
- D: Not resistant

Remarks:

Data is only provided as orientation and is not guaranteed

Material	Plastic			Metal	
	PC/ABS	PVC	PA	AL stainless steel	Brass
Exhausts, alkali	N/A	A			
Exhausts, containing hydrogen fluoride	C	A			
Exhausts, containing carbon dioxide	A	A			
Exhausts, containing nitrose	N/A	A			
Exhausts, containing hydrochloric acid	N/A	A			
Exhausts, containing sulphur dioxide	N/A	A			
Exhausts, containing sulphuric acid	N/A	A			
Exhausts, containing sulphur trioxide	N/A	A			
Acetone	D	D			
Acetylene	A	B			
Battery acid	A	A			
Alcohol	A	A			
Aluminium (hydroxide) acetate	A	A			
Aluminium chloride	C	N/A			
Ammonium chloride	A	A			
Apple juice	A	N/A			
Orange juice	A	N/A			
Orange oil	C	N/A			
Benzine	C	B			
Beeswax	A	N/A			
Beer	A	A			
Epsom salts->See: Magnesium sulphate	A	A			
Bitumen	B	N/A			

Boric acid	A	A		
Brandies->See: Spirits	A	A		
Brake fluid	D	A		
Bromine	D	B		
Butter	A	N/A		
Butyric acid	D	B		
Calcium hypochlorite	C	B		
Calcium sulphate	A	A		
Chlorine	B	A		
Chloral hydrate	C	D		
Curry	B	N/A		
Dibenzyl sebacate	C	N/A		
Dibutyl phthalate	N/A	N/A		
Dibutyl sebacate	C	D		
Glacial acetic acid->See: Acetic acid	A	A		
Elaol->See: Dibutyl phthalate	D	D		
Developer liquids	A	A		
Natural gas, primarily methane	A	N/A		
Groundnut oil	B	N/A		
Crude oil	C	N/A		
Vinegar	A	A		
Acetic acid	D	A		
Acetic ester	D	D		
Fat, vegetable	B	N/A		
Fat, animal	B	N/A		
Fat, cooking oils	B	N/A		

Anti-freeze	A	N/A		
Fruit juices	A	A		
Fructose	A	N/A		
Plastic	A	A		
Glycerine	C	A		
Urea	A	B		
Heating oil	C	A		
Helium	A	N/A		
Henkel-P3 solution	B	N/A		
Wood oil	B	N/A		
Wood tar oil->See: Creosote, honey	C	C		
Tincture of iodine	C	D		
Cocoa	A	N/A		
Cocoa butter	A	N/A		
Natural rubber dispersion	B	N/A		

Fuel	D	N/A		
Kerosene	D	A		
Pine needle oil	C	N/A		
Lavender oil	C	N/A		
Cod liver oil	A	A		
Glue (bone glue)	A	A		
Linseed oil	A	A		
Lemon grass oil	C	N/A		
Lysol	C	N/A		
Margarine	A	N/A		
Jam	A	A		
Machine oil	B	N/A		
Seawater->See: Salt water	A	A		
Milk	A	A		
Lactic acid	A	B		
Lactose	A	A		
Mineral oil	A	A		
Mineral water	A	A		
Nail polish remover	D	N/A		
Naphthalene	C	D		
Naphthalene (in alcohol)	C	N/A		
Wetting agent	B	A		
Nicotine	C	A		
Niacin	B	A		
Nitrobenzene	D	D		
Nitrobenzoic acid	C	A		
Cellulose thinner	D	N/A		
Oils and greases, vegetable	B	A		
Oils, essential	C	N/A		
Olein	A	A		
Palm oil	B	A		
Paraffins	A	A		
Paraffin emulsion	B	A		
Paraffin wax	B	N/A		
Perfumes	C	A	B	
Pectin	A	A	C	
Petroleum	C	A	A	
Phenol	D	D	C	
Phosphates	N/A	N/A	C	
Phosphoric acid	A	A	B	
Polyran M25N lubricating oil	N/A	N/A	D	

Propyl alcohol	A	B	D
Mercury	A	A	A
Suet	A	N/A	A
Suet emulsion	B	A	D
Castor oil	A	A	A
Crude oil	C	A	A
Rose oil	C	N/A	A
Dettol	C	N/A	A
Salicylaldehyde	B	C	A
Salicylic acid	A	B	A
Ammonia	A	A	A
Household ammonia	A	A	A
Nitric acid	D	C	A
Hydrochloric acid	D	B	A
Salt water, seawater	A	A	A
Lubricating oils	A	A	A
Soft soap	B	A	A
Sulphuric acid	C	A	A
Soap solution	B	A	A
Mustard	A	N/A	D
Silicon greases	A	N/A	A
Silicon oil	A	A	C
Spirits	A	A	B
Ethanol	A	A	A
Detergent	B	N/A	D
Turpentine substitute	C	N/A	D
Spirit of turpentine	D	B	B
White spirit	B	A	B
Transformer oil	C	A	A
Urine	A	A	A
Vaseline	A	C	D
Vaseline oil	A	A	A
Waxes	A	N/A	D
Walnut oil	B	N/A	A
Cleaning agent	A	A	N/A
Water H2O	A	A	A
Water, distilled	A	A	D
Hydrogen	A	A	D
Hydrogen peroxide	A	A	A
Softener	C	N/A	A
Wines	A	A	A
Spirits of wine	A	A	A

Tab 3: Material compatibilities



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