

## IP-Ratings

IP-Ratings is a set of standards for how resistant an object is, based on two parameters marked respectively as **IP X-** and **IP -X**.

An object, for example a membrane can, may be marked as IP65

The first digit indicates how well the can protects the contents **against intrusion of contaminants**, but also about the risk of getting in touch with the can's content.

First digit	Short description	Requirements for implementation
0	Unprotected	No special protection
1	Protected against solid objects with a diameter of 50 mm or above.  Protected against touch of dangerous parts with the <b>backside of a hand</b> .	A ball with a diameter of <b>50 mm</b> is not allowed to penetrate the material.  The ball must remain in enough distance from dangerous parts
2	Protected against solid objects with a diameter of 12.5 mm or above.  Protected against touch of dangerous parts with <b>one finger</b> .	A ball with a diameter of <b>12.5 mm</b> is not allowed to penetrate the material.  An accessibility probe with a <b>diameter</b> of <b>12 mm</b> and a <b>length</b> of <b>80 mm</b> must remain in enough distance from dangerous parts
3	Protected against solid objects with a diameter of <b>2.5 mm</b> or above.  Protected against touch of dangerous parts with a <b>tool</b> .	A testing probe with a diameter of <b>2.5 mm</b> is not allowed to penetrate the material.  The testing stick must remain in <b>enough distance</b> from dangerous parts.
4	Protected against solid objects with a diameter of 1.0 mm or above.  Protected against touch of dangerous parts with <b>threads</b> or similar tools.	A stiff testing probe with a <b>diameter</b> of <b>1.0 mm</b> is not allowed to penetrate the material.  The testing probe must remain in enough distance of dangerous parts En stiv prøvepind med en diameter på <b>1,0 mm</b> må ikke kunne trænge ind i materialet.
5	<b>Dust-resistant.</b>	Intrusion of dust isn't completely stopped, but dust is <b>not allowed</b> to enter in a volume that will affect the material's function or safety.
6	<b>Dust-proof.</b>	Dust is <b>not</b> allowed to penetrate the material.

The second digit indicates how well the object resists **intrusion of water**.

<b>Second digit</b>	<b>Short description</b>	<b>Requirements for implementation</b>
0	<b>Unprotected.</b>	<b>No</b> special protection.
1	Protected against <b>water drops</b> .	<b>Vertically falling water drops</b> are not allowed to have any damaging effects.
2	Protected against water drops with a <b>maximum tilt</b> of 15°.	<b>Vertically falling water drops</b> are not allowed to have any damaging effects, when the capsule is tilted with a <b>15° angle</b> .
3	Protected against <b>rain</b> .	Water falling like rain with up to a <b>60° angle</b> is not allowed to have any damaging effects.
4	Protected against <b>overspray</b> .	<b>Water spraying</b> against the capsule from <b>any direction</b> , is not allowed to have any damaging effects.
5	Protected against <b>jets of water</b> .	<b>Water from a sprinkling pipe</b> directed towards the capsule from <b>any direction</b> is not allowed to have any damaging effects.
6	Protected against <b>powerful jets of water</b> .	<b>Powerful jets of water</b> directed towards the capsule from <b>any direction</b> are not allowed to have any damaging effects.
7	Protected against the consequences of being <b>lowered into water</b> .	It is not allowed for water to penetrate the capsule in damaging levels, when the capsule is <b>lowered into water</b> under <b>defined conditions</b> according to <b>pressure and time</b> .
8	Protected against the consequences of being <b>lowered into water</b> for an <b>extended period</b> .	It is not allowed for the water to penetrate in damaging levels, while the capsule is <b>lowered into water</b> for an <b>extended period</b> .

Sometimes the IP-Ratings may have a **letter at the end**. The letter indicates protection of touching, but it is only used **if the level** of touch-protection is **higher than designated** by the first digit, or if there is a need for designating the degree of touch-protection, while the degree of protection against intrusion of contaminants is of no matter.

Letter	Short description	Requirements for implementation
A	Protected against touch of dangerous parts with the <b>backside of a hand</b> .	A ball with a <b>diameter</b> of <b>50 mm</b> must remain in <b>enough distance</b> of the dangerous parts.
B	Protected against touch of dangerous parts with a <b>finger</b> .	An accessibility probe with a <b>diameter</b> of <b>12 mm</b> and a <b>length</b> of <b>80 mm</b> must remain in <b>enough distance</b> of the dangerous parts.
C	Protected against touch of dangerous parts with a <b>tool</b> .	A testing probe with a <b>diameter</b> of <b>2.5 mm</b> and a length of <b>100 mm</b> must remain in <b>enough distance</b> of the dangerous parts.
D	Protected against touch of dangerous parts with <b>threads</b> or similar tools.	A stiff testing probe with a <b>diameter</b> of <b>1.0 mm</b> and a <b>length</b> of <b>100 mm</b> must remain in <b>enough distance</b> of the dangerous parts.

## The most commonly used IP-Ratings are:

### IP21

Used for materials that are used indoors and **are not** exposed to water.

### IP44

Used for materials that are used outdoors and **are in risk** of being exposed to water.

### IP65

Used for materials which are used outdoors and **are in a high risk** of being exposed to water.