

WHITE PAPER: IP Rating

Basically, an IP Rating is a measurement of how well a box keeps out dirt and water. This is not for just any box, but for an enclosure intended for safe operation of electrical equipment. The rating of "IP" and two digits is sometimes stated as International, or Ingress, Protection. An IP rating goes beyond the old claim of "waterproof."

If you have seen the inside of a computer or cellphone, you see the tiny and fragile electronic parts. Many are smaller than a grain of rice. You might see a thin, shiny layer coating the parts, a conformal coating. If there is no coating, dirt and water must be kept away from these parts by other means, such as barriers or seals installed during assembly of an electronic device.

The IP numbers show how well a container protects its contents. The first digit after "IP" is protection rating from solids, which includes protecting people from the container's contents and protecting the contents from people and their tools. The second digit is protection rating from liquids, which includes atmospheric moisture and immersion.

Mostly, an IP rating is important only when electrical equipment is put to work in a dirty, wet place or in other harsh conditions. Harsh operating conditions call for assembling (or shopping for) electrical equipment with IP 65 or higher ratings. Due to frequent cleaning, higher level protection may be needed at IP 69 or 69K. These ratings are applied to food processing machinery, car wash systems and road vehicles subject to frequent washdown. Refer to IEC 60529 and ISO 20653 (road vehicle) standards for more information.

Fittings and connections to electrical enclosures can be tested for an IP rating. ANACONDA SEALTITE® conduit and fittings are tested to meet requirements of the IEC (International Electrotechnical Commission), which set standards for protection. If needed, see IEC 60529 (Ed. 2.1), clause 4.1 and the European EN 60529 for information. These standards include testing across a broad range of operating conditions to make sure electrical equipment operates safely and reliably.

Here is a simple description of IP 65, IP 66, IP 67 and IP 68 ratings.

Solids	Description	Liquids	Description
6	Dust tight, Complete protection from solids	5	No harmful effect from water nozzle spray
		6	No harmful effect from powerful water spray from any direction
		7	No harmful effect from liquid immersion to 1 meter depth
		8	No harmful effect from liquid immersion to 3 meters depth



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