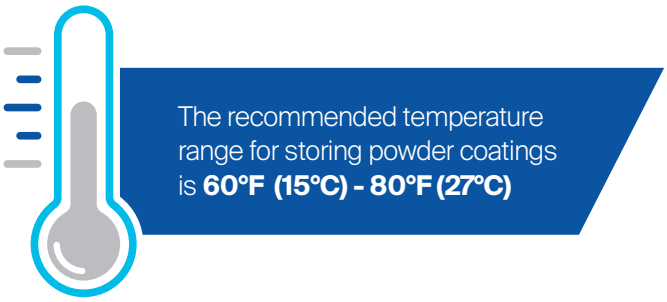
PPG Powder Coatings

What are the optimal storage conditions for powder coatings?

Optimum conditions should be defined on a product-specific basis. Every powder product has an individually defined shelf life rating that is related to its storage temperature. You'll find this information on the product data sheet.



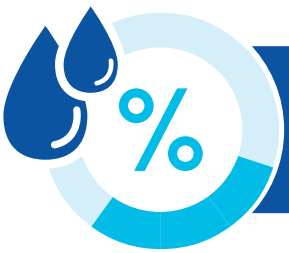
The recommended temperature range for storing powder coatings is **60°F (15°C) - 80°F (27°C)**

If temperatures are below 60°F (15°C)

Typically, low temperature has no harmful effect on powder performance properties. In fact, refrigerated storage of powders is a recommended method for maximizing the physical and chemical shelf life of a powder. However, cold powder acts as a condensation site when exposed to higher temperature, humid air. For this reason it is recommended that bulk containers of powder coating be allowed to equilibrate to application room temperature for at least several hours prior to opening of the container. This precaution is especially important during winter in northern climates when powder may have been transported or stored at very low temperatures, below 32°F (0°C).

If temperatures are above 80°F (27°C)

Powder may form lumps in bulk containers, possibly caking together to form substantial agglomerates that cannot be pumped or easily broken by powder handling equipment. Heat may also be detrimental to the chemical stability of many powder products.



The recommended humidity range for storing powder coatings is **40% - 60%** relative humidity

While there are no safety concerns if the powder is stored at high/low humidity, there are application issues that could arise:

If humidity is too low (0% - 20% RH)

- Accumulated electrostatic charges increase the risk of the mixture explosion.
- Electrostatic charging of particles becomes much less efficient. As a result, first pass transfer efficiency decreases significantly.
- Grounding of conveyor, part hangers, and associated spray booth equipment becomes a more critical factor than usual, since extremely dry air does not facilitate charge migration to ground.
- Sparking may be seen in transport hoses due to frictional charging. In some cases, frictional charging is counter productive to electrostatic charging efficiency at the spray gun electrodes.
- Back-ionization (electrostatic rejection) may occur at lower film thicknesses than usual, particularly when powder is applied over a primer.

If humidity is too high (80% - 100% RH)

- Fluidization in feed hoppers and reclaim hoppers may deteriorate due to moisture absorption on particle surfaces leading to agglomerates.
- Impact fusion buildup and plugging of injector block feed pumps are aggravated by the presence of water.
- Electrostatic charges may decay more rapidly from particles, resulting in reduced transfer efficiency. In severe cases, loss of dry particle adhesion may occur when particulate coated parts are mechanically conveyed subsequent to spray application but before melting in the bake oven can be achieved.
- In some cases, film properties may suffer due to the presence of water on particle surfaces. There may be a reduction in gloss, perhaps associated with noticeable out-gassing, pinholing, or "solvent" popping, film defects created by the pressure of water vapor driven from the powder during the cure process.
- In severe cases, high water levels may affect film adhesion to the substrate or promote flash rusting of substrates prone to oxidation.

PPG Industrial Coatings • One PPG Place, Pittsburgh, PA 15272 • 1.888.774.2001 • ppg.com/industrialcoatings