PPG Powder Coatings

Low-Cure FAQs: Sustainable Low-bake Powder Coatings

What are some of the challenges with low-cure powder coatings?

- Gloss control
- Surface finish (smooth and some textures)
- Package stability/shelf life
- Physical properties – hardness, flexibility, chemical resistance, etc. are more challenging at lower temperatures

What low-cure products or chemistries does PPG already have?

United States and Canada (USCA) available products:

Chemistry	Gloss	Powder coatings smoothness standards (PCI est.)	Lowest Cure	
			Time (min.)	Temperature
Triglycidyl Isocyanurate (TGIC)	50-80	2	15	275°F (135°C)
Epoxy	50-80	2-3	20	250°F (121°C)
Urethane	No low-cure offering			
Hydroxyalkylamide (HAA)	50-80	2-3	15	340°F (171°C)

Can PPG make any chemistry in a low-cure product?

We likely can, although we need the following information to be sure:

- Does the customer have a preferred chemistry?
- What is the gloss requirement?
- What time and temperature do they consider to be low cure?
- Are there any performance criteria to consider?
- Does the appearance have to be a specific PCI smoothness? Or what is the requirement?
- What is the motivation to consider a low-cure formulation?

Why would a customer want a low-cure product?

There are several reasons why a customer would ask for a low-cure product, including:

- Fast-cure for efficiencies
- Oven limitations
- Substrate or part limitations
- Lower energy usage

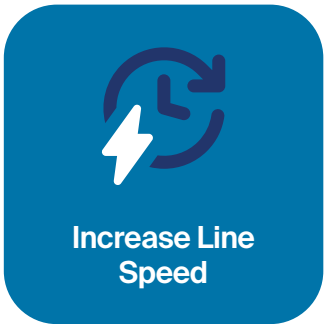
If you understand why a customer may need a low-cure option, we can formulate to that need.

Should we run a datapaq?

Yes, a datapaq is helpful for us to understand the oven profile and if a low-cure product would meet the need of the customer. We need more information than just a datapaq to be the most successful. Understanding why a customer is asking and what the end-goal is are both important for success.

How do I help my customer determine if they need low-cure?

Some common reasons why we see customers move to low-cure products due to under-cured parts or a need to increase line speed. A customer may also want to show sustainability efforts. They may not save a ton of energy (use the modeling tools) but they can demonstrate sustainability efforts by using a low-cure product and lowering oven temperatures.



How do I know what qualifies as low cure? How can I determine if my product is low-cure already?

You should always look at the cure time and temperature on the product's Technical Data Sheet (TDS) to be certain if a product is low cure. PPG's definition of low-cure is anything below 10 minutes at 340 °F (171°C). There may also be an indication of low cure if the name includes "LC" or the brand is ENVIROCRON HeatSense. You will see ENVIROCRON UltraX in Europe.

Definition of low cure at PPG

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What end uses are ideal for low-cure formulations?

This depends on what your customer needs. Most of our products can be formulated in a low-cure technology with no performance differences. A general guideline is that as the cure temperature decreases and you move toward lower cure products, the performance begins to vary. So, for example the hardness and flexibility of a product curing 10 minutes at 300°F (149°C) should be less than the hardness and flexibility that cures 10 minutes at 400 °F (204°C). To be sure, you should check the TDS for your low-cure product.

What is the scope of the low cure project?

The low-cure project includes technology to cure 10 minutes at 300°F (149°C) for all gloss ranges (high gloss, semi-gloss, low gloss, matte) and a range of color options. It also includes improving performance levels to the AAMA 2604 specification despite the lower cure time and temperature.

Who can I contact for more help?

For additional questions, please reach out to Julia Haponski (jhaponski@ppg.com), powder product manager. She can review your questions and customer need and direct you to the appropriate lab personnel.