

ask the expert...

THE A-Z OF BN COATINGS



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John Blasen, Global Market Development Manager, ZYP-Pyrotek Coatings, responds to commonly posed questions from equipment operators. John's emphasis on developing customer solutions is on improving metal quality while reducing maintenance and consumable expenses through proper use and application of boron nitride-based coatings.

Pyrotek is the global distributor of ZYP boron nitride coatings for the molten metal industry. ZYP successfully developed the only state of the art continuous process for the production of its proprietary BN powder, and is also the world leader in boron nitride paints for preventing sticking and wetting in aluminium processing.

Q: What are these coatings?

A: Essentially, to produce a quality BN paint, there are three main considerations that must be carefully balanced and controlled to meet customers' performance goals. These include the BN powder, the binder system and the carrier system.

Several key BN powder properties are very important to the performance function of the coating itself, including crystallinity (how slippery the powder is), purity (low purity costs less and

contains, for example, unreacted boric oxide), and particle size (too fine becomes chalky; too coarse becomes dusty since the binders cannot hold it together).

The binder is the "glue" that bonds it all together. This binder must be strong, be present in sufficient quantity to wet and bind all the BN particles, and thin enough to reveal the beneficial properties of the BN and not mask them.

The carrier system is usually either water-based or solvent-based, each having its own advantages. Most ZYP coatings are water-based. However, because water quality varies and can affect the coating either in a positive or negative manner, ZYP uses highly purified water to aid in ultra long product shelf life.

The other unique component of the ZYP BN coating line is the availability of the blue colourant. This component is non-reactive and will not fade immediately as with alternative organic colourants. Nor will this blue pigment adversely impact even the thinnest of rolled aluminium products. Deleterious effects usually include conditions such as pin-hole leaks.

Q: How do these coatings work?

A: In molten metal transfer systems, such as launders and troughs, these coatings provide a smooth, Teflon® like, non-wetting surface that allows for metal flow, without sticking or adherence. The colourant enables operators to readily see where they have applied the BN coating, particularly on white refractories.

Q: In what applications can they benefit?

A: Applications include launders, troughs, pouring spouts, gates, filter

boxes, fixtures, furnaces, dross presses, runners, basins, stalk tubes, risers, tundishes and funnels.

Q: What are the real production and process advantages in practice?

A: Advantages of using a BN coating include the following items.

- Protects troughs and lining components, requiring only periodic touch-up
- Stops growth of damaging corundum
- Prevents downtime by sealing cracks and crevices
- Stops dross build up
- Minimises rework in rebuilding ceramic refractories
- Reduces maintenance costs
- Water-based and easy to apply
- Excellent suspension characteristics, adherence and durability
- Non-wetting
- Chemically inert
- Effectively releases scull
- Adheres to tools and refractories

Q: Why are there several grades of the Lubricoat instead of just one?

A: The properties of the materials (refractories, metals, etc.) upon which the BN coatings are applied vary greatly. The pH of the surface to be painted, the porosity of the substrate and its chemical make-up, all affect the coating. The alloying ingredients, how aggressive the alloy is, and the temperature at which the metal is held, all affect the components of the binder.

ask the expert... (continued) by John Blasen**THE A–Z OF BN COATINGS**

In addition, factors influenced by the customer's maintenance practices affect the success of the coatings. Additional considerations included the temperature of the substrate at application, the type of application, such as spray, brush or foam applicators, the recoat frequency, and whether dilution is envisaged. Most important, it is vital to understand the customers' current practices and willingness to implement change. Without their full support, the "solution" offered may not be accepted and certainly will not become their practice.

Q: What is the best way to apply BN Coatings?

A: This depends directly on the



BN coatings applied to refractory of molten aluminium delivery system

customer's means of application, how much time is taken and the recoat frequency. In general, the customer will best accept a practice that involves the fewest changes. The product can be applied effectively, for example, by brush, spray, or with foam brushes and rollers. Contact John Blasen at johbla@pyrotek-inc.com for full details on this process, including explanations of how to maximise spray practices in both primary aluminium and foundry applications.

**John Blasen is a Pyrotek specialist in the product technology of boron nitride coatings, with three decades of experience in the global aluminium industry.*