Non-stick coating manufactured with Coldab®

Challenge

To combine non-stick properties with good wear-resistance in a coating application for the food industry.

Solution

A composite of silicone and Amorphous Diamond (AD) was deposited using Coldab® laser deposition technology.

Background

Non-stick coatings are typically based on polymers which are not very resistant to wear. The wear resistance is required to make the coating compatible with many cycles of operation and cleaning. It is desirable to mix the polymer with a harder material to form a composite, combining advantageous properties of the two materials. It is virtually impossible to make such graded composites with accurate control using conventional coating techniques.

Results

A number of material combinations were investigated and a composite of silicone and AD was finally chosen. Other alternatives could have been fluoropolymers, alumina, titania or an appropriate combination of all these materials.

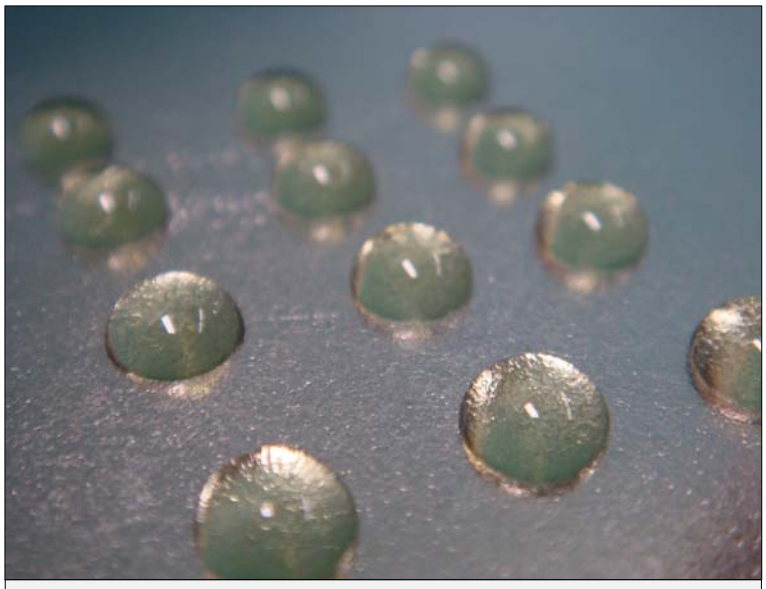

Figure 1. Non-stick, wear-resistant coating on stainless steel. The form of the droplets is an indication of the high contact angle.

Picodeon
Surface Freedom™

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The treatment reduced accumulation of material on the coating from 108 mg/test area to 0.0 mg/test area. Hardened steel ball did not wear the coating in pin-on-disk test (6 mm ball, 100 g, 100 rounds, wear track 5 mm in diameter.

Coldab® advantages

1. Ability to reproducibly deposit composites and/or graded structures of materials from very different material groups, e.g. to improve wear resistance
2. Deposition of heat-sensitive materials
3. Deposition on heat-sensitive substrates
4. Superior adhesion
5. Ability to implement the process on an industrial scale

Fields of use

Non-stick coatings are used in the food and process industry, for household goods, in medical applications and for displays for handheld devices such as mobile phones.

Picodeon's patented Coldab® laser deposition technology offers the unique benefit of being able to deposit virtually any type of layer on any type of material. We can now do what was impossible before. Layers include diverse functional thin films and coatings with strong adhesion to heat-sensitive materials like plastic and paper. In addition, Coldab® promotes cost-effective and environmentally friendly production through shorter cycle time, energy-saving, low vacuum and expanding surface production from pinhead size to large sheets.

When it comes to surfaces, you now have the freedom to do what you want. Contact us to see how we can help you with your particular coating application.

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