



Aviation



Mining & Construction



Steel



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Flash Carbide Coatings with Amperit 658

— Process Efficiency, Performance...and More

Flash Carbide Introduction

Flash Carbide is a type of thermal spray coating that uses High Velocity Air Fuel (HVOF) spray technology. With an advanced spray gun design and lower application temperature, this technology allows the use of finer cuts of spray materials to create thin, dense carbide coatings with low as-sprayed surface roughness. These coatings are emerging as a promising alternative to Hard Chrome Plating (HCP) due to their sustainability, enhanced properties, and comparable process costs. The success of the coating depends on the following factors:

- The as-sprayed surface roughness is minimized to reduce the effort required for surface finishing.
- The coating thickness matches the dimensional tolerances of the treated components, with minimal deviation.
- The coatings are dense enough to achieve the desired corrosion resistance.
- The coatings have a good combination of hardness, bond strength, and residual stress to achieve the desired mechanical properties.

Höganäs' Solution

Amperit 658 is a WC 10Co 4Cr powder expertly engineered and manufactured using a unique process for superior HVOF Flash Carbide coatings. Compared with other materials available on the market, Amperit 658 has the following advantages:

- **Increased process efficiency**

Amperit 658 achieves 15%-60% higher deposition efficiency, enabling faster throughput and lower application costs.

- **Reduced need for surface finishing**

Coatings from Amperit 658 exhibit 10-40% lower as-sprayed surface roughness, resulting in reduced cost and time for post-application processing.

- **Better corrosion resistance**

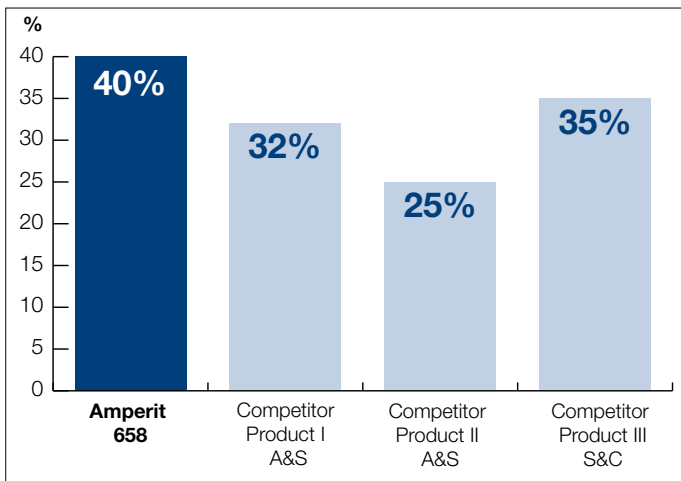
Amperit 658 has a higher apparent density, producing denser coatings with lower porosity and permeability. Coatings as thin as 50 µm have successfully passed 1,000 hours in a neutral salt spray test and have shown zero leakage in gas permeability tests.

- **Strong mechanical properties**

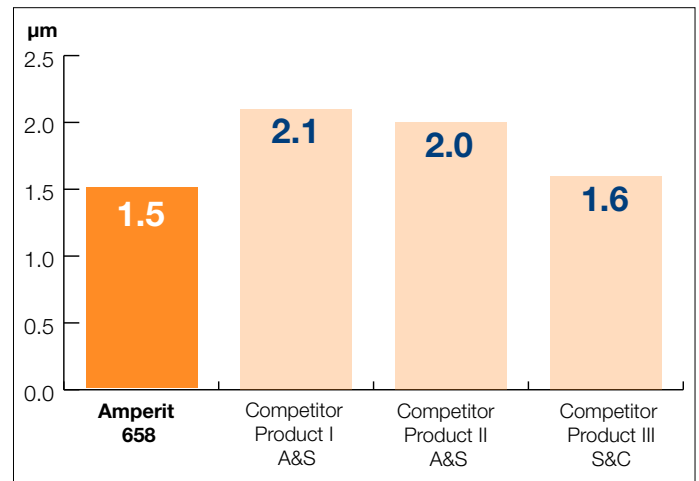
Amperit 658 coatings demonstrate high hardness and splat cohesion, excellent adhesion to the substrate, and optimal residual stress levels.

- **Stable coating process**

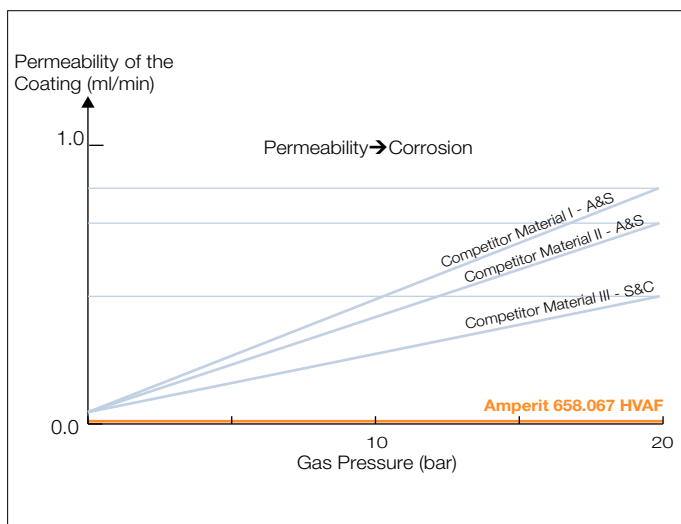
Amperit 658 has good flowability and consistent quality, ensuring stable and reliable spray processes while delivering evenly distributed coatings with high precision.



HVOF: Comparison of Deposition Efficiency



HVOF: Comparison of Coating Surface Roughness (Ra)



Amperit 658 can also be sprayed with conventional HVOF systems to create pore-free coatings. Surface roughness is in the range of Ra 1.5 µm, the same low level as that of HVOF coatings. Results in gas permeability tests and deposition efficiency are also close to the levels of HVOF coatings. The coatings exhibit slightly lower compressive stress due to the reduced peening effect caused by lower particle velocities. This could result in decreased coating hardness, depending on the spray conditions. Overall, Amperit 658 HVOF coatings offer good corrosion resistance, high deposition efficiency, a smooth surface in as-sprayed conditions, and good wear properties. They are an excellent choice for applications where fit-for-use performance at a lower cost is the ultimate goal.

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