# InfernoWare® Shield Black Sapphire PSE-82

Technical Data Sheet

**Color Description**

Black Sapphire is a spray alternative to traditional gun, knife, and sword bluing and is also an equivalent to traditional 19th century gun bluing with a semi-gloss finish.

**InfernoWare® Shield Product Description**

InfernoWare® Shield is a high-performance abrasion and heat resistant coating that provides a tough barrier of protection. It's a uniquely-formulated durable spray coating that features single-part application, air cure, and no special application equipment. Once cured, the coating provides a tough barrier usually only found in more complicated and expensive coating systems. This product is PFAS free.

**Product Features**

- Hybrid ceramic coating
- High thermal resistance
- Excellent abrasion resistance
- Single-part spray application; no catalyst or special equipment
- Room temperature air cure formula
- Can easily be applied to steel, aluminum, plastics, and many other substrate materials
- Low VOC formula
- This product is PFAS free

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|---|---|
| Recommended Spray Application Temperature | 60-80 °F (15-27 °C) |
| Recommended Spray Application Relative Humidity | 30-80% |
| Cure Condition | Room Temp Air Cure (Do Not Heat Cure) |
| Cure Time[1] | 30-50 min tack free, 2-3 hrs to recoat |
| Recommended Thickness (mil) | 1 |
| Strainer Size (micron) | 100 |
| Gloss Level / Units (GU) | Semi-gloss/40.5 |
| Specific Gravity | 1.209 |
| Viscosity, Zahn #2 Cup (s) | 27 |
| % Solid Content | 52.6 |
| Theoretical Coverage Based on 1 Mil Thickness ($ft^2$/gallon) | 844 |
| Cured Coating Stability Maximum Temperature (F/C) | >480 °F (250 °C) |
| Multi-Finger Scratch (15N) | Excellent |
| Mohs Test (Using Silver) | >2.5 |
| Cross Hatch Adhesion ASTM D3359 | 5B |
| Pencil Hardness Scratch ASTM D3363 | 9H |
| Taber ASTM D4060 (Cs17 wheels, 1000g) (cycles/mil) | 481 |
| Solvent Resistance using Birchwood Gun Cleaner/ Acetone ASTM D5042-19 | No effect/ No effect |
| Impact Performance Direct/Indirect (inch*lbs.) ASTM D3794 | TBD |
| Corrosion resistance (ASTM B117. Scratch line method) (Hrs.) | >240 |
| Note Definitions | Note 1: Cooler temperatures or higher humidity may prolong curing and tack free time. |

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## Test Parameters for Technical Data

**15N:** Multi-Finger Scratch. A 1.0mm hemispherical metal scratch tip is motor-driven across the coated surface. Various weights are mounted on each arm finger to apply a standard force on the test material. All coatings showed no scratches with a 10 Newton force (previous car paint standard), so we reported the scratch resistance using a 15 Newton force (new car paint standard): excellent is no scratch, very good is very light scratch, and good is light scratch.

**Silver scratch test:** This quality control test uses a rounded scratch tip made of 99.999% silver, motor-driven across the coated surface with a 500g weight applied. Silver has a Mohs of 2.5, therefore a result of >2.5 means no scratch and <2.5 means coating was scratched.

**Crosshatch:** ASTM D3359. ASTM D3359 is a standard method for measuring adhesion using a tape test. This test evaluates the adhesion of film coatings to metallic substrates by applying and removing pressure-sensitive tape over cuts made in the film. Also known as the Cross Hatch test, Method B involves creating a perpendicular lattice pattern with six cuts in each direction through the film. A calibrated pressure-sensitive tape is then applied over the lattice and removed. The adhesion is assessed by comparing the results with descriptions and illustrations, and it is rated on a scale from 0 to 5.

**Taber:** ASTM D4060. Taber tests involve placing a flat specimen on a turntable platform that rotates at a fixed speed of 60rpm. Two Taber abrasive wheels (CS17), each applied with a specific pressure using a 1000g weight, are lowered onto the specimen surface. The characteristic rub-wear action is created by the contact between the test specimen and the rotating abrasive wheels. As the turntable rotates, the wheels move in opposite directions around a horizontal axis, tangentially displaced from the specimen's axis. One wheel rubs the specimen outward toward the edge, while the other rubs inward toward the center, with a vacuum system removing loose debris during the test. The wheels complete a full circle on the specimen surface, revealing abrasion resistance at all angles relative to the material's weave or grain. We report the Wear Cycles Per Mil (0.001 inch), which indicates the number of abrasion cycles required to wear through a coating of a known thickness.

**Solvent:** ASTM D5042. A cotton swab or rag is soaked in a harsh solvent and vigorously rubbed several times against the coated surface. The coating and swab are then inspected. A rating of No effect indicates no color change to the sample, and slight discoloration indicates some minor color change or removal from sample.