

1. PRODUCT DESCRIPTION

ECS 4410 High Temperature Thermal Protection Coating is a high performance thermal protective coating formulated to reduce radiated heat. ECS 4410 is extremely durable and provides best in class thermal protection performance at temperatures of up to 1600°F (871°C). ECS 4410 may be applied to almost any metal, composite, or semi-rigid plastic substrate. It is an easy to apply one-component formulation. ECS 4410 is solvent based, VOC exempt and environmentally friendly. It provides excellent corrosion resistance. ECS 4410 is designed for use on automotive components such as engine headers, engine manifolds, exhaust pipes, heat shields, exhaust mufflers and catalytic converters. It is also very effective on aircraft engine components.

2. SURFACE PREPARATION

- Surfaces must be free from oils and other containments before applying coating.
- Recommend sandblasting surface to be coated. Use fine 120 grit aluminum oxide, garnet, or equivalent abrasives. Do not use glass or natural sand abrasives because this will reduce coating adhesion to the surface.
- Do not handle blasted parts with bare hands as salts/acids will contaminate the surface and possibly cause a loss of adhesion in those areas that will be exposed to extreme heat or weathering.
- Carefully apply dry air to blow off any dust from the surface before beginning coating.

3. APPLICATION

- As with any new material, always test application and finished properties on a low value test article or panel before working on valuable surfaces.
- Mix coating well before applying to ensure that no solids have settled to the bottom of the container. If in doubt, pour the contents into a new container just prior to application to ensure that no solids have settled.
- **Coating interior surfaces:**
 - **Spray Method (Recommended)**
 - Plug all openings AND threaded holes to prevent coating from entering them.
 - Hang all parts to be coated to enable easy spraying of surfaces. It may be necessary to attach a thin wire on small pieces to prevent swinging while spray coating the part.
 - Use HLVP or similar spray gun fitted with a fine tip (i.e. 0.08). A finer spray mist is better, enabling the product to flow out easier and help control the final film thickness.
 - Spray tip should be positioned approximately 6-8" from the substrate. This is particularly important if the application environment is above normal room temperature. Spraying from too far away will result in some solvents evaporating prior to contact with the surface and therefore resulting in sub-optimal performance.
 - Spray most difficult area first.
 - Target dry film thickness of 0.5 to 1 mil (12 – 25 microns).
 - Very important not to build the coating too thick. **More is not better.** A coating 0.5 to 1 mil will retain heat in the pipe to increase cylinder scavenging and help reduce the radiated heat.
 - Note: Wipe any runs or drops from the exterior. The outside is now ready to spray. Refer to next section for instructions. If any coating has dried on the outside surface, re-blast the exterior (only) to remove it before full application. **ECS 4410 Series Coating does not effectively bond to itself.**
 - **Dip ("Slosh") Method (Acceptable)**
 - If it is not possible to effectively spray the interior components, a "slosh method" is acceptable.
 - Plug one end with a rubber or silicone tapered plug. Pour in a modest amount of coating inside. Plug or cap the other end. Gently tip and roll the component to cover the interior. Remove one plug and drain back into a container.
 - Note: excess coating may be re-used for other interior applications. Recommend avoiding using the excess coating on exterior applications as the coating may have absorbed small grit particles during interior slosh application.
- **Multiple Coats (Interior Only)**
 - One coat of ECS 4410 will be optimal for most applications. In rare cases where multiple coats are desired, an



intra-coat primer/adhesive must be used. In no circumstances should a second coat of ECS 4410 be applied directly to an existing layer of ECS 4410. ECS 520 is recommended as an intra-coat primer in these situations.

- ECS 520 High Temperature Primer may be applied as an intra-coat adhesion agent between multiple coats of ECS 4410 (for interior applications only).
- Coating must be applied thin (approximately 2-3 microns wet film). **More is not better.** Thicker application will reduce performance.
- Per instructions in the previous section, apply ECS 4410 on the inside and allow this to ambient cure until the coating is dry to the touch.
- Coated part may be placed in an oven at 250°F for 30 minutes or longer to further cross-link the first coat.
- Once the part is cool to the touch, apply a 2-3 micron wet film of ECS 520 onto the cured layer of ECS 4410. This needs to lightly wet the surface only.
- Within **2-5 minutes** apply the 2nd ECS 4410 Color Coat **wet-on-wet**.
- **Do not** allow the ECS 520 primer to dry before top coating.
- Allow the coated part to dry to the touch in a warm air environment (room temperature to 110°F/43°C maximum)
- For the best coating properties, allow the part to cure for 5 days.
- If time does not allow for a 5-day ambient cure, then allow the part to remain at 110°F for as long as time allows before elevating the oven temperature to 350°F (177°C) for 30 minutes
- These curing instructions are designed to slowly evaporate the solvents through the uncured film. Heating the coating too quickly will inhibit a proper cure and may also create vapor porosity with the coating that will decrease durability.
- **Exterior coating:**
 - If interior has been coating prior to exterior application, wipe any runs or drops from the exterior. If any coating has dried on the outside surface, re-blast the exterior (only) to remove it before full application. ECS 4410 Series Coating does not effectively bond to itself.
 - Follow instructions for Spray Method in Interior Coating section above.
 - Exterior coating may be applied immediately after interior coating.
 - Note: Multiple coats of ECS 4410 are not recommended for exterior applications. Multiple exterior coats will have negligible impact on performance and will make the exterior coating vulnerable to direct impact.

4. DRYING & CURING TIMES

Solids	65-75%
Drying Time	Dry to the touch in approximately 20-30 minutes at ambient temperatures. Warmer airflow will accelerate dry time.
Curing Time	Full ambient cure properties are obtained approximately 5 days after application (at room temperature). Warmer temperatures will result in a faster cure. Ambient cure will achieve the maximum performance. See instructions above for accelerated oven cure.

5. COVERAGE RATE

- Coverage rate is approximately 1,140 square feet per gallon (28 square meters per liter) at 25 microns thickness and 1,900 square feet per gallon (47 square meters per liter) at 15 microns.

6. STORAGE STABILITY & SHELF LIFE

The shelf life is one year when stored in the original, unopened container. Store containers in a well-ventilated and covered area away from extreme heat and moisture. Contact your eCoat representative if you have any questions about the products or its uses.

7. SAFETY

Refer to the Safety Data Sheet for this product prior to use.

