



**Exploring the Possibility of Adding
Fire Preventative Capabilities to our
Automotive Corrosion Preventative
Coatings**

BASELINE TEST METHOD FOR DETERMINING THERMAL RUNAWAY SUPPRESSION

INTERNAL BURN TEST METHOD

- Propane torch with gas flow fully open
- Torch set at 1 inch distance from center of substrate
- Blue flame in contact with substrate at all times during test (1200°C)



25 seconds burn through – anything beyond considered improvement

BASELINE RESIN SYSTEM & PACKAGES

TRS-BEV1

RESIN SYSTEM – Qualifying Properties

- Thin film for light weight application
- Adhesion to aluminum, e-coat and galvanized substrates
- Does not propagate flame
- Good chip and corrosion resistance

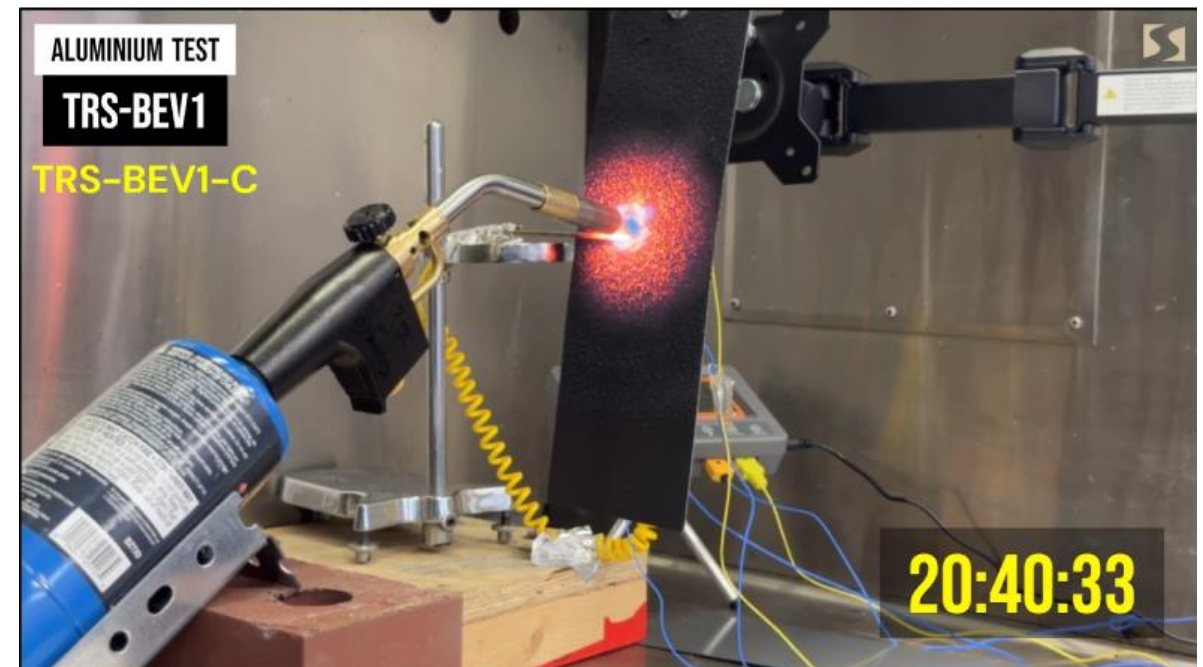
Additive Packages

- Package A – Additive A
 - **TRS-BEV1 - A**
- Package B – Additive B
 - **TRS-BEV1 - B**
- Package C – Additive A+B
 - **TRS-BEV1 - C**

BASELINE BURN TEST PERFORMANCE

TRS-BEV1 VARIATIONS

TRS-BEV1 – A	TRS-BEV1 – B	TRS-BEV1 – C
2 min 38 sec	49 sec	21 min



BASELINE TEST METHOD FOR CORROSION RESISTANCE

ASTM B117 SALT SPRAY

- Untreated cold rolled steel Q-Panels
- All panels given 7 days cure time
- Panel edges protected - corrosion measured on main surface of panel
- Panels observed every 2 days up to 500 hours



BASELINE SALT SPRAY PERFORMANCE

TRS-BEV1 VARIATIONS

STANDARD (no additive)			TRS-BEV1 – A			TRS-BEV1 – B			TRS-BEV1 – C		
500 h	500 h	500 h	18 h	18 h	18 h	116 h	157 h	500 h	116 h	116 h	116 h
											
3 mil	5 mil	10 mil	3 mil	5 mil	10 mil	3 mil	5 mil	10 mil	3 mil	5 mil	10 mil

SCOPE OF WORK

BASELINE OBSERVATIONS

- Different additives in TRS-BEV1 variations offer various salt spray results, with potential improvements in performance at higher film thicknesses.
- Different additives offer various levels of burn through prevention.

GOALS

- Find a balance between corrosion prevention and burn through prevention.
- Incorporate the additive packages into our traditional cavity waxes.

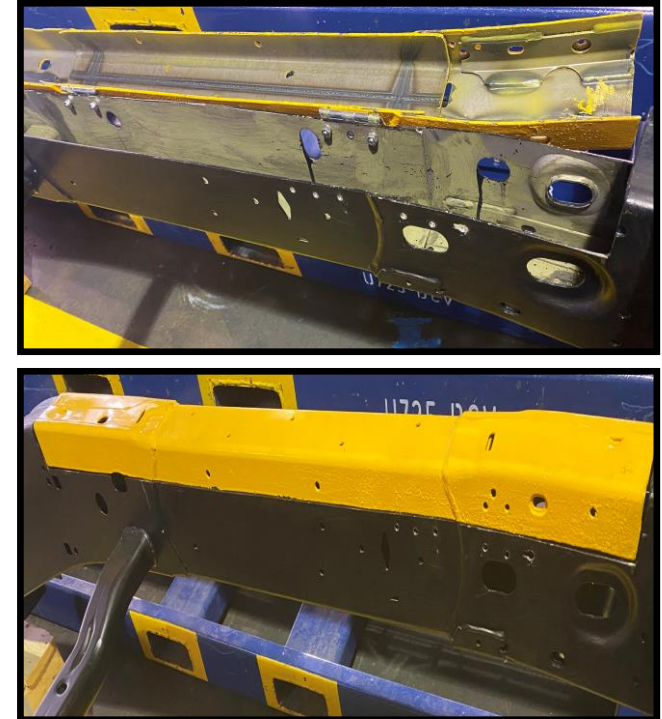
Does the incorporation of fire preventative packages into our traditional cavity wax systems offer a better balance between burn through prevention and corrosion prevention?

CAVITY WAX CORROSION PREVENTATIVE TECHNOLOGIES

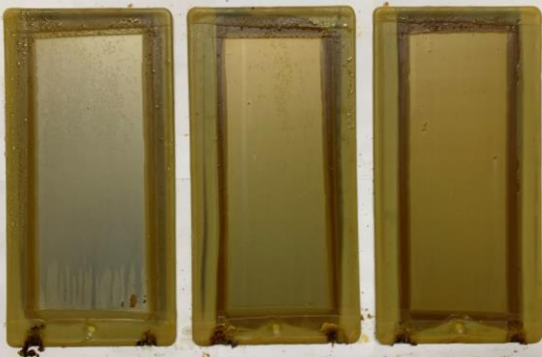
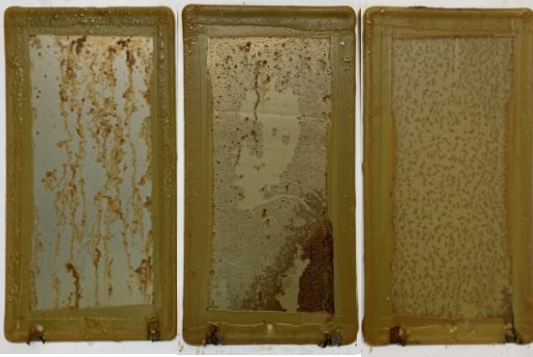
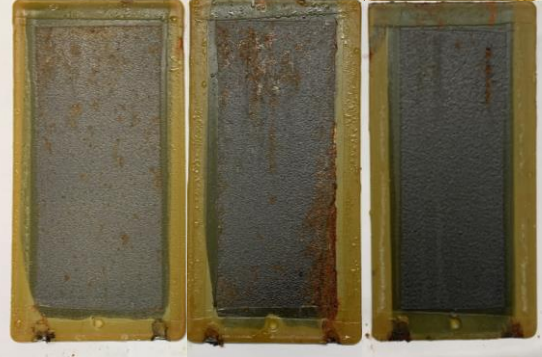
CAVITY PRO SERIES

- CAVITY PRO 200 – Solvent-Free Wax Air Cure
- CAVITY PRO 400 – Water-Based Wax

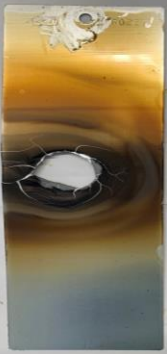
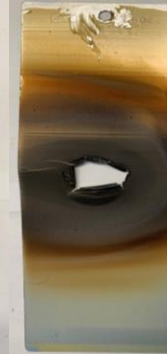
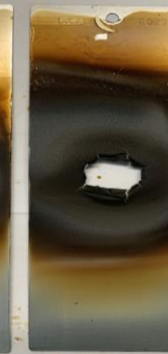
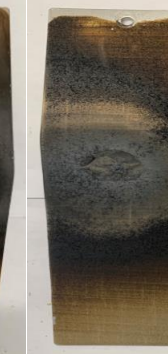
*Coatings labelled in testing as A, B, & C denote previous additive packages



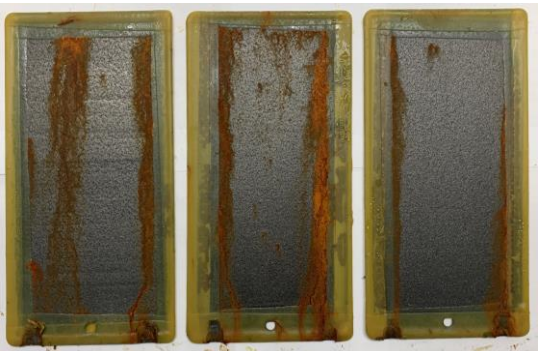
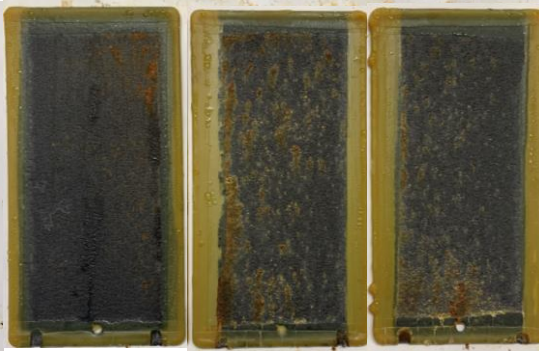
SALT SPRAY PERFORMANCE

STANDARD (no additive)			CAVITY PRO 200 - A			CAVITY PRO 200 - B			CAVITY PRO 200 - C		
500 h	500 h	500 h	500 h	500 h	500 h	116 h	157 h	343 h	157 h	295 h	500 h
											
3 mil	8 mil	12 mil	3 mil	8 mil	12 mil	3 mil	8 mil	12 mil	3 mil	8 mil	12 mil

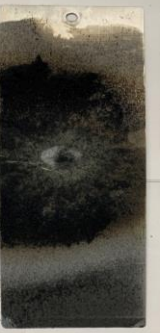
BURN TEST PERFORMANCE

STANDARD (no additive)			CAVITY PRO 200 - A			CAVITY PRO 200 - B			CAVITY PRO 200 - C		
32 sec	34 sec	37 sec	2m 27s	15 min	15 min	30 sec	37 sec	55 sec	15 min	15 min	15 min
											
3 mil	5 mil	10 mil	3 mil	5 mil	10 mil	3 mil	5 mil	10 mil	3 mil	5 mil	10 mil

SALT SPRAY PERFORMANCE

STANDARD (no additive)			CAVITY PRO 400 - A			CAVITY PRO 400 - B			CAVITY PRO 400 - C		
500 h	500 h	500 h	500 h	500 h	500 h	67 h	67 h	67 h	43 h	89 h	89 h
											
3 mil	5 mil	10 mil	3 mil	5 mil	10 mil	3 mil	5 mil	10 mil	3 mil	5 mil	10 mil

BURN TEST PERFORMANCE

STANDARD (no additive)			CAVITY PRO 400 - A			CAVITY PRO 400 - B			CAVITY PRO 400 – C		
31 sec	32 sec	38 sec	15 min	15 min	15 min	15 min	15 min	15 min	15 min	15 min	15 min
											
3 mil	5 mil	10 mil	3 mil	5 mil	10 mil	3 mil	5 mil	10 mil	3 mil	5 mil	10 mil

**metal skin did not break through
until torch was removed*

CONCLUSION

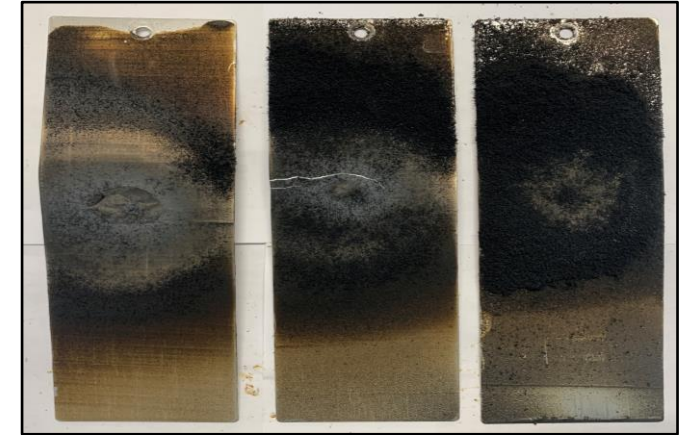


- **Cavity Pro 200 – A** offers corrosion resistance comparable to its standard.
- Presents significantly better results versus all TRS BEV1 variations.

✓ Higher film thicknesses provide better resistance to burn through and corrosion.

✓ Coating systems react differently to each additive package.

✓ Formulations can be altered depending on the application, providing potential in addressing specific demands.



- **Cavity Pro 200 – C** demonstrated best performance in burn through prevention at all film thicknesses.
- Surpasses all TRS BEV1 variations in corrosion prevention but reduced performance versus formula A.