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LABORATORY ACCREDITATION BUREAU
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Certificate # L2267 Testing

Comparison of Ten Rust Preventatives on Machined Steel Parts

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Project #: 12-227-1825.bis

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Date: November 8, 2012

Background: The customer wants to compare the corrosion protection of ten different rust preventatives on their small machined steel parts.

Sample Received:

- 12 Machined steel parts coated in oil (Cylindrical approximately 1" in diameter and 1" high)
- 1 Bottle of Universal RP 1 (~250 mL)
- 1 Bottle of Universal RP 2 (~250 mL)
- 1 Bottle of Universal RP 6 (~250 mL)
- 1 Bottle of Perkote 16 (~250 mL)
- 1 Bottle of Perkote 312 (~250 mL)
- 1 Bottle of Universal Oil MSO 165 L (~250 mL)
- 1 Bottle of Universal Oil RP HF 165L (~250 mL)

Method: ASTM D-1748 Humidity (120ºF, ~99% relative humidity)

Materials: Metal test parts
Laboratory grade methanol
VpCI-414

Procedure: The following procedure was used:

1) All parts were cleaned using VpCI-414 to remove the oil and left to dry.
2) All parts were dipped in methanol and dried with a lint-free wipe.
3) Parts were dipped for approximately 10 seconds each in the following rust preventatives:
    a. VpCI-325
    b. VpCI-329 D
    c. Ecoline 3690
    d. Universal RP 1
    e. Universal RP 2
    f. Universal RP 3
    g. Perkote 16
    h. Perkote 312
    i. Universal Oil MSO 165 L
    j. Universal Oil RP HF 165L
    k. No rust preventative (Control #1)
    l. No rust preventative (Control #2)
4) Label all 12 parts and hang to drip overnight.
5) Place all parts in ASTM D-1748 Humidity Cabinet.
6) Monitor parts 2 times a day for corrosion failure.
7) Remove parts after 150 hours and take photos.

Results: The following results were found:

ASTM D-1748 Humidity

Rust Preventative Used	Time to Failure (Hours)
None (Control #1)	4
None (Control #2)	4
Universal RP 1	8
Perkote 16	24
Universal Oil MSO 165 L	32
VpCI-329 D	32
Perkote 312	48
Universal Oil RP HF 165L	56
Universal RP 2	72
Universal RP 6	128
VpCI-325	144
Ecoline 3690	DNF*

*DNF (did not fail) during 150 hours of testing

Interpretations:

The tests indicate three rust preventatives perform significantly better than the rest. Universal RP 6 and VpCI-325 both did not fail until after 128 hours and had minimal rust at the 150 hour test completion. Ecoline 3690 provided exceptional protection and did not fail during the testing period.

Universal RP 1 and Perkote 16 provided the worst protection, as the Universal RP 1 part was comparable to the control parts. The remaining the five rust preventatives (Universal Oil MSO 165 L, VpCI-329 D, Perkote 312, Universal Oil RP HF 165L, and Universal RP 2) all provided mediocre corrosion protection. Further analysis can be accomplished with evaluation of the part photos below.

Photos: Photos of parts taken after 150 hours in humidity cabinet:


Control #1


Control #2


Universal RP 1

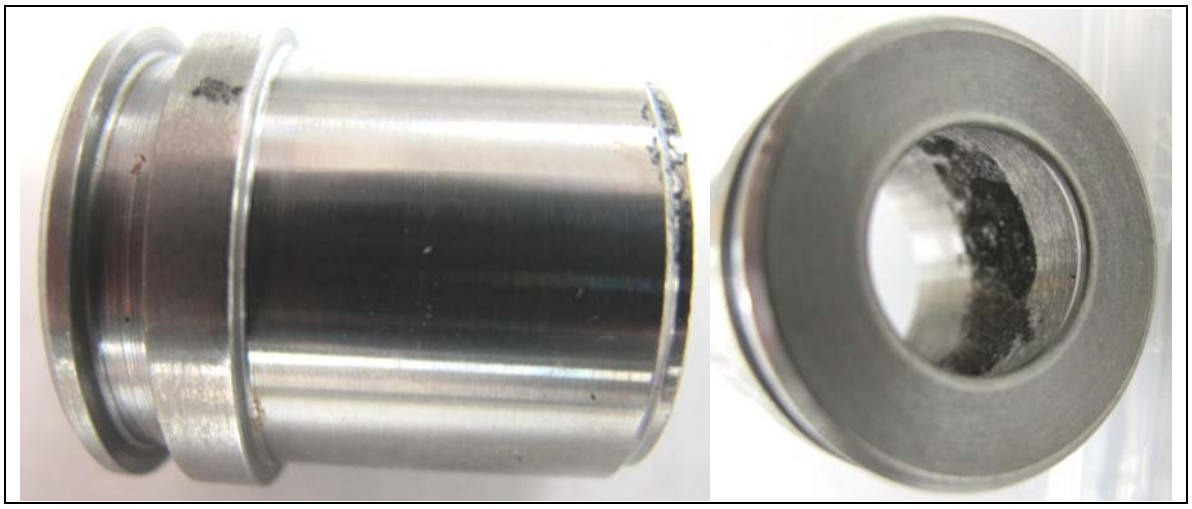
Perkote 16

Universal Oil MSO 165 L

VpCI-329 D

Perkote 312

Universal Oil RP HF 165L



Universal RP 2

Universal RP 6

VpCI-325

EcoLine 3690