

Evaluation of Castrol Alpha SP 200 with Cortec Additives

Purpose: Add Cortec additives to blind oil samples from Castrol with VpCI additives ranging from 0-3% and then compare their performance in the ASTM-D-1748 Humidity Cabinet.

Materials: Alpha SP 200 A
Alpha SP 200 B
Alpha SP 200 C
Alpha SP 200 D
Alpha SP 200 E
Alpha SP 200 F
M-320
VpCI-322
M-529
M-238

Method: Standardized Compatibility Test
ASTM-D-1748 Humidity Cabinet

Procedure: *Standardized Compatibility Test*

- 1) The solutions listed in appendix A were created for compatibility testing.
- 2) The solutions were placed in an 80°C oven
- 3) After 16 hours the solutions were removed from the oven and inspected.
- 4) Next the samples were placed in a 0°C refrigerator.
- 5) After 8 hours the samples were removed and inspected.
- 6) This is considered one test cycle and the samples were subjected to three test cycles.
 - a. Elevated temperatures and additive concentrations that will never occur in use are utilized during testing to ensure the solutions are compatible.

ASTM-D-1748 Humidity Cabinet

- 1) 1010 carbon steel panels were coated with the solutions listed in Appendix B
- 2) After 24 hours the panels were suspended in the ASTM-D-1748 Humidity Cabinet and were periodically inspected
- 3) After 1010 hours the panels were removed from the ASTM-D-1748 Humidity Cabinet, inspected, photographed and a report was written.



Results:

Standardized Compatibility Test
M

Sample	Time of Inspection, hours						
	-	8	24	32	48	54	72
A3	FC	FC	FC	FC	FC	FC	FC
B3	FC	FC	FC	FC	FC	FC	FC
C3	FC	FC	FC	FC	FC	FC	FC
D3	FC	FC	FC	FC	FC	FC	FC
E3	FC	FC	FC	FC	FC	FC	FC
F3	FC	FC	FC	FC	FC	FC	FC
G3	FC	FC	FC	FC	FC	FC	FC
H3	FC	FC	FC	FC	FC	FC	FC
I3	FC	FC	FC	FC	FC	FC	FC
J3	FC	FC	FC	FC	FC	FC	FC
K3	FC	FC	FC	FC	FC	FC	FC
L3	FC	FC	FC	FC	FC	FC	FC
M3	FC	FC	FC	FC	FC	FC	FC
N3	FC	FC	FC	FC	FC	FC	FC
O3	FC	FC	FC	FC	FC	FC	FC
P3	FC	FC	FC	FC	FC	FC	FC
Q3	FC	FC	FC	FC	FC	FC	FC
R3	FC	FC	FC	FC	FC	FC	FC
S3	FC	FC	FC	FC	FC	FC	FC
T3	FC	FC	FC	FC	FC	FC	FC
U3	FC	FC	FC	FC	FC	FC	FC
V3	FC	FC	FC	FC	FC	FC	FC
W3	FC	FC	FC	FC	FC	FC	FC
X3	FC	FC	FC	FC	FC	FC	FC
Y3	FC	FC	FC	FC	FC	FC	FC
Z3	FC	FC	FC	FC	FC	FC	FC
AA3	FC	FC	FC	FC	FC	FC	FC
BB3	FC	FC	FC	FC	FC	FC	FC
CC3	FC	FC	FC	FC	FC	FC	FC
DD3	FC	FC	FC	FC	FC	FC	FC
FC = Fully Compatible							

ASTM-D-1748 Humidity Cabinet

Panel	Time to Failure (hours)
A3	33
B3	DNF
C3	DNF
D3	DNF
E3	840
F3	48
G3	DNF
H3	528
I3	DNF
J3	DNF
K3	552
L3	DNF
M3	DNF
N3	864
O3	288*
P3	864
Q3	DNF
R3	816
S3	DNF
T3	864
U3	129
V3	DNF
W3	DNF
X3	DNF
Y3	DNF
Z3	816
AA3	DNF
BB3	DNF
CC3	DNF
DD3	1008
* = panel was compromised during testing	

Conclusion: M-320 and the other Cortec corrosion inhibiting additives provided large levels of improvement to the corrosion protection provided by the Castrol Alpha SP 200 oil in the ASTM-D-1748 Humidity Test.

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Estimated Cost of Project: 35 hours

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Sample	Sample A Oil	Sample B Oil	Sample C Oil	Sample D Oil	Sample E Oil	Sample F Oil	M-238	M-320	M-529	VpCI- 322
A3	100	----	----	----	----	----	----	----	----	----
B3	90	----	----	----	----	----	10	----	----	----
C3	90	----	----	----	----	----	----	10	----	----
D3	85	----	----	----	----	----	----	----	15	----
E3	80	----	----	----	----	----	----	----	----	20
F3	----	100	----	----	----	----	----	----	----	----
G3	----	90	----	----	----	----	10	----	----	----
H3	----	90	----	----	----	----	----	10	----	----
I3	----	85	----	----	----	----	----	----	15	----
J3	----	80	----	----	----	----	----	----	----	20
K3	----	----	100	----	----	----	----	----	----	----
L3	----	----	90	----	----	----	10	----	----	----
M3	----	----	90	----	----	----	----	10	----	----
N3	----	----	85	----	----	----	----	----	15	----
O3	----	----	80	----	----	----	----	----	----	20
P3	----	----	----	100	----	----	----	----	----	----
Q3	----	----	----	90	----	----	10	----	----	----
R3	----	----	----	90	----	----	----	10	----	----
S3	----	----	----	85	----	----	----	----	15	----
T3	----	----	----	80	----	----	----	----	----	20
U3	----	----	----	----	100	----	----	----	----	----
V3	----	----	----	----	90	----	10	----	----	----
W3	----	----	----	----	90	----	----	10	----	----
X3	----	----	----	----	85	----	----	----	15	----
Y3	----	----	----	----	80	----	----	----	----	20
Z3	----	----	----	----	----	100	----	----	----	----
AA3	----	----	----	----	----	90	10	----	----	----
BB3	----	----	----	----	----	90	----	10	----	----
CC3	----	----	----	----	----	85	----	----	15	----
DD3	----	----	----	----	----	80	----	----	----	20

Appendix A: Samples tested for the Standardized Compatibility Test, amounts are percentage by weight

Appendix B: Samples tested for the ASTM D-1748 Humidity Test, amounts are percentage by weight

Panel	Sample A Oil	Sample B Oil	Sample C Oil	Sample D Oil	Sample E Oil	Sample F Oil	M-238	M-320	M-529	VpCI-322
A3	100	----	----	----	----	----	----	----	----	----
B3	97	----	----	----	----	----	3	----	----	----
C3	97	----	----	----	----	----	----	3	----	----
D	95	----	----	----	----	----	----	----	5	----
E3	93.33	----	----	----	----	----	----	----	----	6.67
F3	----	100	----	----	----	----	----	----	----	----
G3	----	97	----	----	----	----	3	----	----	----
H3	----	97	----	----	----	----	----	3	----	----
I3	----	95	----	----	----	----	----	----	5	----
J3	----	93.33	----	----	----	----	----	----	----	6.67
K3	----	----	100	----	----	----	----	----	----	----
L3	----	----	97	----	----	----	3	----	----	----
M3	----	----	97	----	----	----	----	3	----	----
N3	----	----	95	----	----	----	----	----	5	----
O3	----	----	93.33	----	----	----	----	----	----	6.67
P3	----	----	----	100	----	----	----	----	----	----
Q3	----	----	----	97	----	----	3	----	----	----
R3	----	----	----	97	----	----	----	3	----	----
S3	----	----	----	95	----	----	----	----	5	----
T3	----	----	----	93.33	----	----	----	----	----	6.67
U3	----	----	----	----	100	----	----	----	----	----
V3	----	----	----	----	97	----	3	----	----	----
W3	----	----	----	----	97	----	----	3	----	----
X3	----	----	----	----	95	----	----	----	5	----
Y3	----	----	----	----	93.33	----	----	----	----	6.67
Z3	----	----	----	----	----	100	----	----	----	----
AA3	----	----	----	----	----	97	3	----	----	----
BB3	----	----	----	----	----	97	----	3	----	----
CC3	----	----	----	----	----	95	----	----	5	----
DD3	----	----	----	----	----	93.33	----	----	----	6.67





























