Salt Fog Test Report of Intercept Packaging Material

1. Test Items and Objective

1.1 Source of Test Items

Beijing Anlevo Petrochemicals Technology Co. Ltd requested Assembly and Re-manufacturing Technical Defence Technology Laboratory to carry out neutral salt spray (NSS) test on the Intercept packaging materials and provide its comments against the effective of the anti-corrosion result.

This test was carried out by corrosive and protective laboratory.

1.2 Objective

The provided packaging materials were made into 150 mm x 100 mm packaging bags (all sides are heat-sealed unless one unsealed side). A piece of ϕ 15 mm x 5 mm 45 steel test block was placed in the bag and the bag was heat-sealed (the bar numbering tag was heat-sealed in the bag as well). The test bag samples were hung in the salt-fog chamber to examine the protection period of the packaging material on the test block against corrosion (whereby the test block will not corrode) and comments would be provided accordingly.

2. Testing Equipments and Conditions

2.1 Salt-fog Test Equipment

This test was carried out using the salt-fog test equipment produced by Shanghai Laboratory Equipments Co. Ltd whereby the model is YWX-150L Salt-fog Test Equipment, equipped with an air-compressor with gas exhaust rate $\geq$ 0.3 m^3/min and pressure is 0.5 – 0.8 MPa. The test is indicated in Diagram 1.

2.2 Testing Parameters

a) NaCl solution (NaCl was added to de-ionised water) was prepared according to specified preparation in GB10125-88 'artificial atmosphere corrosion test and neutral salt spray test (NSS Test)' with concentration 50 ± 5 g/L and pH is 6.5 – 7.2.

b) Testing temperature: 35 ± 2^0C.

c) The sedimentation rate of salt vapor in salt-fog test chamber is 1.50 ml/h·80 cm^2.

d) Continuous spray condition.

2.3 Test Samples Numbering Details

Test items are classified to two categories:

(i) First category: 45 steel ϕ 15 mm x 5 mm round test blocks were placed in the packaging bag.

(ii) Second category: 40 mm x 35 mm x 2 mm Q235 steel test panel was placed in the packaging bag. The numberings are indicated in Table 1 and Table 2.

Table 1: Numbering and Details of Test Items (with ϕ 15 mm x 5 mm round test sample inside)

Numbering	Details	
13, 14	Normal CI, 75 μm	with one piece of ϕ 15 mm x 5 mm 45 steel test sample inside
15, 16	CI, 75 μm	with one piece of ϕ 15 mm x 5 mm 45 steel test sample inside
19, 20	SI electrostatic discharge control, 100 μm	with one piece of ϕ 15 mm x 5 mm 45 steel test sample inside
21	RIBS, 100 μm	with two pieces of ϕ 15 mm x 5 mm 45 steel test sample inside
24	RIBS, 100 μm	with one piece of ϕ 15 mm x 5 mm 45 steel test sample inside

Remarks:

i) CI is the short form of Corrosion Intercept.
ii) SI is the short form of Static Intercept.
iii) RIBS-MVTR is the short form of Reactive Intercept Barrier System.

Table 2: Numbering and Details of Test Items (with 40 mm x 35 mm x 2 mm Q235 steel test samples inside)

Serial Number	Details	
30, 31	SI Electrostatic Discharge Control, 100 μm	with one piece of ϕ 15 mm x 5 mm 45 steel test sample inside

3. Test Results

3.1 Test Duration

Neutral Salt Spray (NSS) Test was carried out on 17 May 2006, started at 9.30 am according to GB 10125-88. It was conducted for 24 hours whereby salt vapor was sprayed continuously. During the test period, the chamber was opened every morning at 9.30 am and hence the time of opening and examining was within 15 minutes.

The test was ended on 28 June 2006 at 9.30 am. It was conducted for a total of 42 days and total is 1008 hours.

3.2 Results on Protection against Corrosion of Packaging Materials

The salt fog chamber was opened for examination on 28 June 2006 at 9.30 am. The two test items were taken out from the test chamber. The samples inside the packaging were then taken out and arranged according to the numberings. Photographs were taken directly without cleansing and wiping the samples, as indicated in Diagram 3 and Diagram 4.

The inspection of the above test samples and test panels shows that:

(a) The inspection on 30 May 2006 at 9.00 am (total 312 hours) indicated that there were spots of rust at the edges of the round test samples (serial number is 13, 14) protected by normal CI, 75 μm packaging bag. The rust spots were expanded gradually after this until 1008 hours as indicated in Figure 3. Hence, normal CI 75 μm packaging materials can protect 45 steel against corrosion for 312 hours.

(b) There were no spots of corrosion on other samples and hence those packaging bags can protect 45 steel and Q235 steel against corrosion for more than 1008 hours.

4. Conclusion

The 1008 hours, 35^0C with continuously salt fog spray of Neutral Salt Spray (NSS) Test for packaging bags made of packaging material supplied by Beijing Anlevo Petrochemicals Technology Co. Ltd concluded that:

a) Normal CI, 75 μm packaging material can protect 45 steel test samples for 312 hours.

b) The 45 steel test samples and Q235 steel board protected using CI (75 μm), SI electrostatic discharge control (100 μm), RIBS-MVTR (100 μm) packaging materials were not corroded and looked like a new sample. This was after 1008 hours of Neutral Salt Spray Test was conducted and shows that the protection against corrosion is good.