WHITE PAPER

YANCEY ENGINEERED SOLUTIONS

Enclosure Maintenance, revised February 2009

Applicable to standard polyester powder coated modular interlocking panels.

Introduction

All at YES we appreciate your confidence in your decision to purchase our product. We trust that the equipment will perform to your expectations throughout the machine's life.

Of course preventative maintenance is a key aspect to maintaining performance. This document provides recommendations for ensuring that your enclosure maintains its objectives from acoustic, weather protection, resistance to corrosion and aesthetic perspectives.

Offloading and start up

In our experience the greatest risk of enclosure damage occurs during off loading or start up where rigging chains etc accidently come into contact with the enclosure or high personnel traffic increases the risk of bumps and scrapes. Be sure to fully inspect and repair the paint surfaces following these high risk events.

IMPORTANT NOTE. If motorized louvers are supplied, chances are they will have been specified to operate in the 'failsafe open' mode of operation. In this case YES reverse the motor position to achieve failsafe closed for shipping purposes to prevent a negative pressure and consequent dust build up within the enclosure during transport. If required the motor will need to be reversed (simple quick operation) as part of start up activities.

Inspection

Early detection and rectification avoids escalated failure and high repair costs.

Rule # 1: Report and Rectify problems as they are noticed. Don't wait until the next PM service or routine inspection.

We strongly recommend that the enclosure is inspected every 6 months and every 3 months in harsh weather, or saliferous conditions. The following sections discuss each of the enclosure performance areas and include inspection points.

Acoustic performance

The enclosure achieves acoustic performance using density and absorption methods. The general structure is constructed from 12/14 gauge galvannealed steel or Aluminum if specified, interlocking panels filled with Rockwool insulation lined with galvanized perforated sheet or covered with sound attenuated foam.

Inspection areas, in no particular order of importance:

1. Integrity of door seals. Check for condition and position of the "bubble seal".
2. Integrity of nitrile rubber sealing strips fixed to the rear of the door (if fitted). Check for adhesive bonding and condition of aluminum mechanical fastener rivets.
3. Door adjustment. Door pressure on the bubble seal is adjustable (within limits) via the catch. Doors should be reasonably flush and best adjustment has been achieved when door closure requires "snap" force to fully close but not so much to adversely affect operation of the slam mushroom head escape button on the inside.
4. Free operation of the exhaust flap. Use graphite grease on flap hinge.
5. Noise from exhaust should be smooth sounding gas flow with a low frequency beat. Report any raspness in the tone.
6. Check mechanical security of perforated sheet throughout the enclosure particularly in the front air discharge which is classified as a "wet area".
7. Inspect front air discharge area through access panel for debris.
8. Inspect rear air inlet for blockage.

Weather Protection / Cooling performance

The enclosure has been designed to meet IP12 as defined in BS EN 60529:1992 and has been successfully tested to that standard.

Note 1. The interlocking panels appear as though they have been caulked following assembly. In fact the high grade non sag 1-c polyurethane sealant (260psi tensile strength - ref ASTM D412), selected for its adhesive and sealant properties, and ability to withstand flexing of the panels is spread throughout the mating faces of the panels. This approach has a number of advantages, 1) Wider sealant area with less likelihood of leakage due to exterior deterioration of caulk. 2) UV deterioration is of less concern, 3) Reduced metal-to-metal contact with reduced risk of corrosion emanating from friction of the mating faces.

Note 2. Panels are powder coated prior to assembly.

Under normal circumstances you should not experience leaks as a result of sealant failure. That being said it is of course wise to periodically visually check the sealant for signs of cracking or damage and repair accordingly.

The Sealant is Sikaflex 221. Primer for use in cleaning the joint / repair area is Sikacleaner 226.

The above products are available from YES.

Inspection areas, in no particular order of importance

1. The enclosure is fitted with spring open (failsafe open), 24 vdc motor close inlet dampers between the air inlet plenum and main generator area. If the machine is on standby duty louvers should be closed. IMPORTANT to prevent overheating- Make sure the louvers fully open when voltage is removed from the louvers.
2. Gravity Flaps are fitted in from of the radiator. IMPORTANT to prevent overheating- Check blades are free to move and close under gravity when the machine is at rest.
3. A canvas flexible duct connects the radiator to the gravity outlet louver, principally to prevent air recirculation of hot air from the radiator to the radiator inlet. IMPORTANT to prevent overheating- Check condition of this duct.
4. Integrity of door seals. Check for condition and position of the “bubble seal”.
5. Integrity of Nitrile rubber sealing strips fixed to the rear of the door (if fitted). Check for adhesive bonding and condition of aluminum mechanical fastener rivets.
6. Door adjustment.
7. Panel sealant, see Note 1 above.
8. Exhaust rain flap free to move and self closes with gravity. IMPORANT. Excessive water entering the exhaust silencer can cause catastrophic engine failure.
9. Inspect front air discharge area through access panel for debris.
10. Inspect rear air inlet for blockage.

Aesthetic and Corrosion Resistance

Your enclosure is manufactured from interlocking panels manufactured from 12 gauge mild steel sheet steel. Some parts of the enclosure are manufactured from 7 gauge mild steel sheet steel. In both cases sheet steel is hot rolled, pickled and oiled to ASTM A-569.

The panels have been polyester powder-coated prior to assembly. Powder coating is considerably more durable that wet paint derivatives.

The enclosure and its coating, prior to shipping, has been thoroughly inspected and has been subject to coating repair.

Gloss aesthetic life expectancy

The Powder coatings will loose 50% of it's gloss between 12 and 24 months of south Florida weathering. Less harsh environments will incur proportionately extended periods of time before this level of gloss becomes apparent. The coating has been properly formulated with exterior stable pigments and do not expect to see a color change.

Gloss restoration. In most cases washing with a mild soap and soft cloth can restore the gloss.

Inspection areas

We strongly recommend that the enclosure is inspected immediately post lifting into position and similarly following completion of installation and following commissioning and necessary corrective action taken.

1. Check for paint chip's scratches etc. Repair as necessary. See repair procedure as follows.
2. Drain holes are provided in doors and in the panels making up the front end air discharge plenum, (FED). The FED is a wet area. Ensure that the drain holes are free of obstruction. The FED panels are lined with acoustic insulation which will not deteriorate as a result of moisture how ever it is important that the panels are free to drain to avoid build up of water. If evidence of water build- up has occurred it is important to remove the insulation and restore surface coating as necessary. We would recommend inspection of the lower area of one FED acoustic panel every 3 years (6 months if in a saliferous environment). This is a simple matter of removing rivets for approximately 1/3rd panel height, peeling back the perforated sheet, lifting an area of Rockwool insulation and inspecting the lower channel.
3. The generator set is fitted with thermostatically controlled engine Jacket Water heaters and alternator anti-condensation heaters. In addition the enclosure is fitted with 2 off thermostatically controlled 4.7 kW space heaters. These devices in colder weathers represent important tools in maintaining a conditioned environment. Inspect for correct operation and settings pertinent to the prevailing conditions.

Powdercoat repair procedure

Areas where no rust is prevalent:

1. Area must be cleaned and free of all oil and dirt. A light solvent may be used to remove oil and dirt.
2. Lightly scuffed using and abrasive material such as scotch-brite, fine grit sandpaper, etc. This will promote adhesion to the substrate.

3. Apply quality solvent-based enamel, the color match is PPG (manufacturer), # Q1590-3664. White Enamel.

Areas where rust is prevalent:

1. All rust must be removed. Area cleaned and free of all oil and dirt.
2. Lightly scuffed to promote adhesion
3. Primer applied to surface. Liquid enamel supplier should recommend primer.
4. Apply quality solvent-based enamel, the color match is PPG (manufacturer), # Q1590-3664. White Enamel.

Smaller paint chips can be repaired by hand application of primer and enamel. Larger areas will require paint spray.

Tank Corrosion Protection

Directions For Aerosol Touch Up Spray Paint
Ideal temperature is 70-80F. No or low humidity

Surface Preparation

If sanding is needed: Use a 180 - 320 grit dry sandpaper to removes rust, scratches, or bad surface damage. Scuff with a scotchbrite pad any area to be repainted to ensure adequate adhesion. Entire paint area should be dull and smooth. Thoroughly clean area to be repaired with dish soap (Joy, Dawn etc.) and water. Then dry completely. The use of prep solvent and a clean lint free towel assures the best clean surface free of wax, grease, and other surface contaminates. For better results do not apply spray in direct sunlight, high humidity, or where silicone waxes and dressings are present.

Make sure to tape off areas with a quality tape and paper where over spray is not desired. Enclosed areas require the entire unit to be masked with plastic sheeting. We recommend a 3/4" 3M auto grade tape to mask with paper. Make a line with tape first, then tape paper to your existing tape line. Doubling up newspaper can work fine but paint bleed through it is a strong possibility. We recommend using white or green masking paper 18" wide or longer. Use 2" tape for masking off smaller areas.

Primer

Spray the primer on a test paper first. Primer will fill 320 dry sand scratches. You should final sand the area with 320 before priming. Apply touch up spray paint primer over bare metal. When spraying, always hold the can upright 10-12 inches from the surface. The first coat should be a dust coat followed by a 10

- 15 minute flash time. The next 1-2 building coats are medium wet coats with 10-15 minutes flash time. If additional sanding is required, wait 24 hours prior to sanding. If any sanding is done, then cleaning again is necessary. Use latex or vinyl gloves after this point. Do not touch clean prepped area with bare hands. There is no need two wipe the primer with prep solvent. Use a tack rag to clean the area. The area needs to be clean and completely dust free.

Topcoat

Mask area not to be painted. Thoroughly shake the topcoat color before applying. Spray a test panel with topcoat first to compare color match and coverage. When spraying, always hold the can upright 10-12 inches from the surface. Apply as many medium coats necessary to cover the area leaving 10-15 min. minimum between medium coats. Shake the can periodically between coats. A run in the paint may need to be completely removed by sanding. The amount of coats will always vary you will need to use your own judgment. Do not avoid flash times or apply heavy coats. Doing so may cause runs, solvent pop, or even blistering. The topcoat should feel dry to the touch in 1-2 hours, but will completely cure over seven

Directions For Touch Up Paint Bottles
Ideal temperature is 70-80F. No or low humidity

Surface Preparation

If sanding is needed: Use 180 grit sandpaper to removes rust or bad surface damage. Then use 320 to remove 180 grit scratches. Scuff with a scotchbrite pad any area to be repainted to ensure adequate adhesion. Thoroughly clean area to be repaired with dish soap (Joy, Dawn etc.) and water. Then dry completely. The use of prep solvent and a clean lint free towel assures the best clean surface free of wax, grease, and other oil based surface contaminates. For better results do not apply in direct sunlight.

Primer

Apply touch up primer over bare metal 2-3 coats allowing 10-15 minutes in between coats. If any sanding is done then cleaning again is necessary. Use latex or vinyl gloves after this point. Do not touch clean prepped area with bare hands. There is no need two wipe the primer with prep solvent. Use a tack rag to clean the area. The area needs to be clean and completely dust free.

Paint Touch Up Application

Thoroughly shake the topcoat color before applying. Apply as many coats necessary to cover the area

leaving 10-15 min. minimum between light coats. Do not wet sand or use prep solvent in between coats of primer and topcoat. Brush paint on with smooth strokes. Use very slight pressure when touching the brush to the substrate. The topcoat should feel dry to the touch in 1-2 hours, but will completely cure over seven

Original base/tank paint specification

HIGH PERFORMANCE LIQUID COATING SYSTEM

(1) SURFACE PREPARATION
Service expectancy of a coating is primarily dependent upon good surface preparation. All surfaces must be cured, clean, sound, and free of all mill scale, rust, oil, dirt, dust, grease, and any other contamination, including salt deposits, which would interfere with new coating adhesion. Surface may not be wet. Bare surfaces must be properly prepared prior to coating application.

A) Ferrous Metal Surfaces
A cleaner/phosphatizer & rinse (Milwaukee tap, DI or RO rinse preferred) should be used to clean the substrate.

B) New Galvanized Surfaces
DA Sanding per SSPC-3, an alkaline cleaner/phosphatizer, & rinse (Milwaukee tap, DI or RO rinse preferred) should be used to clean & etch substrate.

C) New Aluminum & Stainless Steel Surfaces
DA Sanding per SSPC-3, a cleaner/phosphatizer, & rinse (Milwaukee tap, DI or RO rinse needed, exceptions can be made only if TDS is below 150), should be used to clean and etch the substrate.

(2) Diamond Vogel
Stratum Urethane Primer - Corrosion-Resistant
Product PRIMER
Series PG/VLX (Part A)
Part No. IG-0267 (Part B)
One (1) Coat Application – 1 to 2 mils DFT

(3) TOP COAT
Diamond Vogel
NexGen - High Performance 2-Component Polyester Alkyd Urethane
Product Series IB/VLX (Part A)

Part No. IG-0267 (Part B)
One (1) Coat Application – 1 to 2 mils DFT

TOTAL DRY FILM THICKNESS (DFT) = 2 to 4 mils

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