

# 6. NOTES

## 6.0. General Dyn-O-Flo HD Notes

Dyn-O-Flo HD is a 100% concentrate inhibited propylene glycol and is recommended for use in applications where low acute oral toxicity is important or where incidental contact with drinking water is possible. Extra strength corrosion inhibitors in the HD fluid are formulated for high temperature use, resulting in reduced maintenance and longer inhibitor life in most applications. Freeze tolerances are based on a set of acceptable limits.

### 6.0.0. Use Directions

- Do not use full strength.
- Recommended concentration is 40 – 60%.
- Dilute with good quality soft water. If the tap water has more than 25 ppm of chloride or sulfate ions, or more than 50 ppm of calcium or magnesium, use mountain spring water.
- Do not use zinc or galvanized components in contact with the fluid.
- System preparation: Flush thoroughly with water (use 1 – 2% TSP) and circulate without adding heat, before introducing the operating fluid.
- Fluid Introduction: Please see the Helio-Pak systems Manuals for filling, venting and priming.
- Maintenance: The fluid should be checked periodically for pH, which should not drop below 8, and reserve alkalinity, which should stay greater than zero at all times.
- Flush thoroughly before replacing with new mix.
- The Dyn-O-Flo HD has an operating temperature range of -50 – 325 °F.

### 6.0.1. Specifications

- *Specific Gravity:* 1.053 – 1.063
- *Propylene Glycol:* 94%
- *Inhibitor Concentration by Weight:* 6%, inhibitors and water
- *Dye:* Bright yellow
- *Suspended Solids:* substantially free
- *Reserve Alkalinity:* 15 mL

### 6.0.2. Values at 50% Concentration

The listed values are typical of a 50% by volume aqueous solution at 120° F and should not be regarded as specifications.

- *pH:* 9.5 – 10.5
- *Specific Heat:* 0.842 BTU / lb °F
- *Freezing Point:* -30 °F
- *Burst Protection:* < -60 °F
- *Viscosity:* 2.36 Cps

### 6.0.3. First Aid

While essentially non-irritating, absorbing or toxic, Dyn-O-Flo HD heat transfer fluid should be kept away from children and be treated with care. In case of physical contact, follow these directions:

- *Eyes:* Flush with plenty of water
  - *Skin:* Wash off with flowing water
  - *Ingestion:* Induce vomiting and consult a physician
  - *Inhalation:* Remove to fresh air, consult physician.
- Notice to Physician: No specific antidote. Supportive care based on judgment of physician.

### 6.0.4. Handling

- *Exposure Guidelines:* Propylene glycol: AIHA WEEL is 50 ppm total, 10 mg / m<sup>3</sup> aerosol only.
- *Ventilation:* Good general ventilation should be sufficient for most conditions.
- *Respiratory Protection:* No respiratory protection should be needed.
- *Skin Protection:* For brief contact, no precautions other than cleaning of body and covering. Use impervious gloves when prolonged or frequently repeated contact occurs.
- *Eye Protection:* Use safety glasses.

- *Spills:* Cover with absorbent material, soak up and seep into bag.
- *Disposal:* Discharge into sanitary sewers only with the explicit pre-approval of the local waste water facility. Any disposal practice must be in compliance with federal, state, provincial and local laws and regulations. Check with the appropriate agencies.

### 6.0.5. Maintenance

The glycol / water mix should be tested periodically for freeze protection and pH. Empty the system and flush thoroughly before replacing with a fresh mix when the pH drops below 8, or reserve alkalinity approaches zero.

### 6.0.6. System Fluid Information

Always use copper tubing for collector supply and return connections. Black iron pipe can also be used, with proper dielectrics. Never use galvanized pipe or plastic based products, such as PEX.

Use only Dyn-O-Flo HD or similar heat transfer fluid with good quality water mixture: min 40% HD mixture, max 60% HD mixture. Substitution of any other heat-transfer fluid may cause irreparable damage and create a health and safety hazard. Do not use distilled water. Good quality water: chlorides and sulfates must be less than 25 ppm; calcium and magnesium must be less than 50 ppm (as calcium carbonate, with hardness less than 100 ppm). If unsure, use bottled mountain spring water.

Rinse system with 1 – 2% mixture of trisodium phosphate and water. Remove the expansion tank for testing only, and pressure test system with water before filling.

Maintain minimum operating pressure of 30 psig when system is cold to avoid pump cavitation. If using an air vent during filling, ensure it is closed during system operation.

### 6.0.7. Safety Precautions

Follow all local codes and regulations. Work should only be performed on the HPAK and system when it is disconnected from the power supply.

When creating and repairing roof penetrations, ensure final seal disallows any unwanted animal or creature intrusion, and the integrity of the structure is not compromised. Penetrations through fire-rated assemblies must not reduce fire resistance capacity below code. Ensure building materials adjacent to solar components are not exposed to elevated temperatures.

### 6.0.8. Components

Always install a tempering valve, or rated anti-scald valve, after the solar storage tank. Route the pressure relief port on the HPAK to avoid accidental scalding in case of release.

Place the HPAK and tank in a non-freezing environment.

Solder suitable for 400°F and 150 psig must be used: 96/4 Tin / Silver is recommended.

### 6.0.9. Description Of Product and Operation

The HPAK is a fully automatic solar energy heat transfer appliance. The controller senses the collector and storage temperatures and powers both circulation pumps when the collector has achieved enough temperature over the solar storage tank. See the Delta-T and Delta-T Pro manuals for full descriptions of operation and functions.

### 6.0.10. Commissioning

After the system is filled, it is normal for the initial pressure to drop as air comes out of solution. Repressurize the system to ensure at least 30 psig when cold.