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GASKET TESTING REGIMEN FOR TRANSPORTATION INTERMEDIATE BULK CONTAINERS

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ABSTRACT

Comprehensive testing using various different gasket types and materials was performed in order to determine the best overall performance in gasket suitability and leakage reliability on an IBC (Intermediate Bulk Container), provided by a tank manufacturer. Prior to testing, the tank was filled with water just below the elevation of the manway, and the remaining space was charged with air. Testing was performed in two phases. Phase 1 was conducted as a simple pressure test with the container in a static state. For Phase 2, a test procedure was developed to include temperature and pressure variations, soak and dwell times, torque value calculations, leakage rates, sustainability, and a simulation of artificial vibration effects on bolted flange connections. Utilizing the Phase 2 procedure gives the ability to compare the various gasket materials under real world conditions, which will reveal the optimum gasket that provides the safest and most reliable connections for the transportation industry. Four corrosion resistant polytetrafluoroethylene (PTFE) based gasket materials were selected to be tested on the IBC. The gasket materials included virgin PTFE, glass-filled PTFE, tanged 316 stainless steel reinforced expanded PTFE (ePTFE), and corrugated 316 stainless steel reinforced expanded PTFE. All testing was performed indoors in a controlled environment. Testing on each gasket type was performed using the same equipment, while following the same test procedures.

INTRODUCTION

Testing and evaluation was performed on the connections of an IBC supplied by a tank manufacturer. The tank arrived fitted with standard skived PTFE gaskets. The IBC has a storage capacity of 805 liters (212 gal.) and a maximum allowable working pressure of 4 BAR (60 psi). The tank is

equipped with 8 total connections (Figures 1 and 2) and a safety relief valve.



Figure 1: Front View of Tank Connections



Figure 2: Side View of Tank Connections