

Certificate of Analysis

Customer

Customer Order Number 3027
 Ship Date 1/29/2013
 Vehicle Number
 Estimated Quantity
 Delivery No.

Product Name **Propylene Glycol USP Grade**

Test Details

| Parameter | Results | Unit | Specifications | |
|-----------------------------|-----------|-------|----------------|--------|
| | | | Min | Max |
| Lot | 130140172 | | | |
| Manufacturing Date | 20130124 | | | |
| Purity, Assay | 99.92 | Wt % | 99.5 | |
| Acidity, as Acetic Acid | 0.001 | Wt % | | 0.005 |
| Water | 0.02 | Wt % | | 0.2 |
| Color | 3 | Pt-Co | | 10 |
| Sulfate | PASS | ppm | | 60 |
| Heavy Metals as Pb | PASS | ppm | | 5 |
| Residual Solvents | PASS | | | |
| Chlorides | < 0.1 | mg/kg | | 1 |
| Iron | < 0.02 | mg/kg | | 0.5 |
| Infrared Spectrum | PASS | | PASS | |
| Specific Gravity @25 | 1.0357 | Deg C | 1.0350 | 1.0370 |
| Residue on Ignition | < 70 | ppm | | 70 |
| Distillation IBP @ 760 mmHg | 186.8 | °C | 185 | |
| Distillation DP @ 760 mmHg | 188 | °C | | 189 |
| Refractive Index @20 C | 1.4323 | Deg C | 1.431 | 1.433 |
| Oxidizing Substances | PASS | | PASS | |
| Reducing Substances | PASS | | PASS | |
| Lead | | mg/kg | | 1 |
| Limit on DEG | PASS | wt% | | 0.10 |
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Notes: (1) Agent Specification Limits -- as results reported

Product meets or exceeds all requirements of the United States Pharmacopoeia (USP), European Pharmacopoeia (EP) and the Food Chemicals Codex (FCC)

Lot Number and Traceability

Traceability may be maintained through the lot number indicated in this document.

The shelf life of propylene glycol USP when stored and handled under appropriate conditions is at least one year from manufacturing date. Subsequent handling and/or repackaging by intermediates may affect shelf life. In general, the user should determine the suitability of any chemical, no matter what the shelf life or length of time of storage. Each user should establish the suitability of any product for his intended use.

Print Date: 1-29-13