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| Client: | DEF Products, LLC |
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|----------------|--------------|
| Analytic ID: | E1712021-002 |
| Batch Number: | 312052017 |
| Sample ID: | DEF 40.6% |
| Date Sampled: | 12/5/2017 |
| Date Received: | 12/11/2017 |
| Report Date: | 12/14/2017 |

Certificate of Analysis

Diesel Exhaust Fluid Analytical ISO-22241
 Client ID: 40.6% DEF Batch# 312052017

| Test Parameter/Method | Units | Test Method (ISO) | Acceptable Limit | Results | Chemist | Analysis Date | Pass/Fail |
|-------------------------------|------------------------------|-------------------|------------------|-----------------|---------|---------------|-----------|
| Urea Content | wt% | 22241-2 Annex C | N/A | 41.2 | SPT | 12/14/2017 | N/A |
| Density @ 20degC | g/cm ³ | 3675 | N/A | 1.1140 | CLB | 12/11/2017 | N/A |
| Refractive Index @ 20degC | N _D ²⁰ | 22241-2 Annex C | N/A | 1.3960 | CLB | 12/12/2017 | N/A |
| Alkalinity as NH ₃ | % | 22241-2 Annex D | <0.2 | <0.01 | CLB | 12/11/2017 | Pass |
| Biuret | % | 22241-2 Annex E | <0.3 | <0.1 | CLB | 12/12/2017 | Pass |
| Aldehyde | mg/kg | 22241-2 Annex F | <5 | <1.0 | CLB | 12/13/2017 | Pass |
| Insolubles | mg/kg | 22241-2 Annex G | <20 | 11 | CLB | 12/12/2017 | Pass |
| Phosphate | mg/kg | 22241-2 Annex H | <0.5 | <0.25 | CLB | 12/12/2017 | Pass |
| Calcium by ICP-OES | mg/kg | 22241-2 Annex I | <0.5 | <0.05 | BDK | 12/14/2017 | Pass |
| Iron by ICP-OES | mg/kg | 22241-2 Annex I | <0.5 | <0.05 | BDK | 12/14/2017 | Pass |
| Copper by ICP-OES | mg/kg | 22241-2 Annex I | <0.2 | <0.02 | BDK | 12/14/2017 | Pass |
| Zinc by ICP-OES | mg/kg | 22241-2 Annex I | <0.2 | <0.02 | BDK | 12/14/2017 | Pass |
| Chromium by ICP-OES | mg/kg | 22241-2 Annex I | <0.2 | 0.04 | BDK | 12/14/2017 | Pass |
| Nickel by ICP-OES | mg/kg | 22241-2 Annex I | <0.2 | <0.02 | BDK | 12/14/2017 | Pass |
| Aluminum by ICP-OES | mg/kg | 22241-2 Annex I | <0.5 | <0.05 | BDK | 12/14/2017 | Pass |
| Magnesium by ICP-OES | mg/kg | 22241-2 Annex I | <0.5 | 0.14 | BDK | 12/14/2017 | Pass |
| Sodium by ICP-OES | mg/kg | 22241-2 Annex I | <0.5 | <0.05 | BDK | 12/14/2017 | Pass |
| Potassium by ICP-OES | mg/kg | 22241-2 Annex I | <0.5 | 0.09 | BDK | 12/14/2017 | Pass |
| Identity by FTIR (attached) | Spectra | 22241-2 Annex J | Match | Reference Match | BDK | 12/13/2017 | Pass |

Note: All ISO standards are up to date with the latest revisions.
 Acceptable Limit values are based on the standard 32.5% urea unless otherwise stated.

"The undersigned certifies that the value(s) reported have met the highest analytical quality control standards."



Certification Approval _____

Laboratory Director: Anthony J Scala

Analytic FDA Reg. Number: 02-636-0096

Date: 12/21/2017

Search results for: E1712021-002
Date: Wed Dec 13 11:35:25 2017 (GMT-05:00)
Search algorithm: Search Expert
Regions searched: 2600.00-450.00

