TECHNICAL DATA SHEET
L-Valine [Feed Grade, 96.5%]

COMMERCIAL GUARANTEE

<table>
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<th>Property</th>
<th>Specification</th>
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<td>L-Valine content</td>
<td>96.5% minimum</td>
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<tr>
<td>Moisture, %</td>
<td>1.5 Maximum</td>
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CHEMICAL / PHYSICAL DATA

- **Chemical formula**: C₅H₁₁NO₂
- **Molecular weight**: 117.15
- **Appearance**: Whitish crystalline powder
- **Purity**: 96.5% (on an as is basis); 98.0% (on a dry matter basis)
- **Dry matter**: 98.5% (Minimum)
- **Bulk density, kg/L**: 0.4 to 0.6
- **Total nitrogen**: 11.54% (on an as is basis)

NUTRITIONAL SPECIFICATIONS

- **Crude protein (%/16 g-N):** 72.13% (on an as is basis)
- **Calculated energy**:
  - Swine, DE: 5,830 kcal/kg, 2,644 kcal/lb
  - Swine, ME: 5,480 kcal/kg, 2,486 kcal/lb
  - Swine, NE: 4,235 kcal/kg, 1,921 kcal/lb
  - Poultry, ME: 5,260 kcal/kg, 2,386 kcal/lb

STABILITY

- **Shelf life**: 2 years (25 kg Bags) when unopened

PACKAGING SPECIFICATIONS

- **Valine 25 kg bags:**
  - Pallet weight: 2,204 lbs (1,000 kg)
  - Pallet size: 39” x 47” (1.00 m x 1.20 m)
  - Stack pattern: 5 bags/layer, 8 bags high (40 bags / pallet)
  - Pallet dimensions (stacked): 39” Wide, 47” Deep, 59” High (1.00 m x 1.20 m x 1.50 m)

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1. The Merck Index, 14th Edition (2006), L-Threonine (9909; Pg. 1703)
2. These values are for informational purposes only and do not constitute any commercial guarantee

The information contained herein is correct to the best of our knowledge. The recommendations or suggestions made in this document are made without guarantee or representation as to result.

For animal feed only – not for human consumption