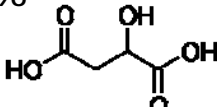


## DL-MALIC ACID - FOOD GRADE

|                     |   |
|---------------------|---|
| Chemical Formula    | : C <sub>4</sub> H <sub>6</sub> O <sub>5</sub>                                      |
| Molecular weight    | : 134.09  |
| CAS Registry Number | : 6915-15-7   |
| E. Number           | : 296   |
| Molecular Structure | :  |

**Appearance:** White Crystalline Granular / Fine Granular / Powder

**Description:** DL-Malic Acid is an important organic compound having a sharp, clean, tart, acidic taste. It is free flowing, stable and hygroscopic.

**Reach Registration Number:**

01-2119552463-40-0000

License under Food Safety and Standards Act, 2006 Number: 10012042000166

**Grades of Granularity:**

**Granular:**

100% passing through USS 10 mesh

10% max. passing through USS 50 mesh

**Fine Granular:**

99% Min. passing through USS 25 mesh

5% Max. Passing through USS 100 mesh

**Powder:**

75% Min. passing through USS 50 mesh

### SPECIFICATIONS (Conform to FCC 10):

| Characteristics                    | Unit                           | Guaranteed |                   | Typical           |
|------------------------------------|--------------------------------|------------|-------------------|-------------------|
|                                    |                                | Min        | Max               |                   |
| Assay on dry basis (Titrimetry)    | Wt. %                          | Min        | 99.5              | 99.8              |
| Maleic acid                        | Wt. %                          | Max        | 0.05              | 0.03              |
| Fumaric acid                       | Wt. %                          | Max        | 1.0               | 0.6               |
| Residue on Ignition (sulfated Ash) | Wt. %                          | Max        | 0.05              | 0.02              |
| Optical (Specific) Rotation        | [α] <sub>D</sub> <sup>25</sup> | Between    | - 0.10 and + 0.10 | - 0.10 and + 0.10 |
| Lead (as pb)                       | PPM                            | Max        | 2                 | <2                |
| Water Insoluble Matter             | Wt. %                          | Max        | 0.1               | 0.02              |

### ADDITIONAL SPECIFICATIONS (TYPE):

| Characteristics              | Unit  | Guaranteed |     | Typical |
|------------------------------|-------|------------|-----|---------|
|                              |       | Max        | Min |         |
| Moisture (by Loss on Drying) | Wt. % | Max        | 0.3 | 0.2     |
| Heavy metals (pb)            | PPM   | Max        | 5   | <5      |
| Arsenic (as As)              | PPM   | Max        | 1   | <1      |
| Mercury (as Hg)              | PPM   | Max        | 1   | <1      |
| Cadmium (as Cd)              | PPM   | Max        | 1.5 | <1      |

*Note: On request.*

### TYPICAL PACKAGING:

|   |   |
|---|---|
| <p>1. PE lined, PE laminated HDPE bag - 25 Kg</p> <p>2. PP laminated 4 ply Paper Bag - 25 Kg</p> <p>3. Fibre drum with PE liner - 30 Kg</p> <p>4. 800, 1000 &amp; 1300 Kg Bulk bag with inner liner</p> <p>5. 1 Kg pouches in 25 Kg HDPE bag</p>  | <p><b>Full Container Load (FCL):</b></p> <p><b>Palletised and Stretch Wrapped</b></p> <p><b>2. Packed in 25 Kg Paper Bags</b></p> <p>36 X 25 Kg Paper Bags / Pallet = 0.9 MT</p> <p>32 X 25 Kg Paper Bags / Pallet = 0.8 MT</p> <p>0.9 MT X 10 Pallets &amp; 0.8 MT x 10 Pallets = 17 MT /FCL</p> <p><b>3. Packed in Fibre Drums</b></p> <p>18 X 30 Kg fibre drums / Pallet</p> <p>= 0.54 MT X 20 Pallets = 10.8 MT / FCL</p> <p><b>4. Packed in Bulk Bags</b></p> <p>20 X 800 Kg bulk bag on pallets = 16 MT / FCL</p> <p>20 X 1000 Kg bulk bag on pallets = 20 MT / FCL</p> <p>20 X 1300 Kg bulk bag on pallets = 26 MT / FCL</p> |
| <p><b>Full Container Load (FCL):</b></p> <p><b>Palletised and Stretch Wrapped</b></p> <p><b>1. Packed in 25 Kg HDPE Bags</b></p> <p>40 X 25 Kg Bags / Pallet = 1.0 MT</p> <p>36 X 25 Kg Bags / Pallet = 0.9 MT</p> <p>a) 0.9 MT X 20 Pallets = 18 MT / FCL</p> <p>b) 1.0 MT X 10 Pallets and</p> <p>0.9 MT x 10 Pallets = 19 MT / FCL</p> |   |

## Legislation:

Thirumalai Chemicals' DL-Malic Acid meets the Food Chemical Codex specifications. German Food additive purity regulation, allows DL-Malic Acid to be added to all food products, without any quantitative limit.

In UK DL-Malic Acid is approved for use by the following:

1. The food standards (Preserves) order - 1953
2. The Soft drinks regulation 1964, amended 1995
3. Miscellaneous additive in Food regulation 1980 No.1834 for general use for an acidulant.

United States, Food and Drug Administration has approved the use of DL-Malic Acid as a general-purpose food additive, except in Baby Foods. It is included in the FDA list as a Generally Recognized as Safe (GRAS) substance.

In India, DL-Malic acid has been approved for use in carbonated beverages and as an acidulant in miscellaneous foods by - Food Safety and Standards Act -2006

## Uses:

- DL-Malic Acid, the natural acid constituent of apple, finds wide application in the food industry. Due to its compatibility with all types of flavour, the flavour enhancing property, the sharp, lingering acid taste and the high water solubility nature, it is ideally suited for the preparation of Juices, Soft drinks, Cider and Wines. Its' non-hygroscopic, free flowing nature, makes it the preferred acid for dry squash juice mixes.
- When used in sugar confectionery, the low melting point of DL-Malic Acid gives greater clarity to the finished product. In cheese preparation, it increases the product yield.
- In diet products, it suppresses the bitter after taste of artificial sweeteners and reduces the amount needed, without affecting the sweetness.
- In fruit and vegetable canning, DL-Malic Acid is used for pH adjustment.
- In the edible oil processing/refining it is used to remove and control traces of metal impurities and as a synergist in admixture with antioxidants, to control rancidity.
- DL-Malic Acid is also used in Pharmaceuticals, Cosmetics, Metal cleaning and Textile finishing.

## Storage:

- It must be stored in ambient temperature, properly covered in a dry well ventilated place.

**Shelf Life:** 24 months from the date of production under recommended storage conditions.

For further details please contact  
**Thirumalai Chemicals Limited**

|   |  |   |
|---|--|---|
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Website: <http://www.thirumalaichemicals.com>

The present product data sheet has the purpose of inform the clients on the quality of our product. The data herein is based on our present best knowledge. For a better suitability of the product for your particular purpose, tests are recommended prior product use. Our clients must be sure that the present data sheet hasn't been changed or replaced by a newer edition.