(AN ISO 9001, 14001, 50001/ HACCP & FSSC 22000 CERTIFIED COMPANY)

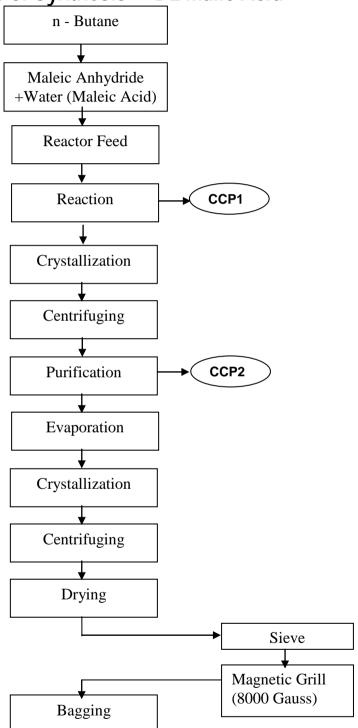
CIN: L24100MH1972PLC016149

25-A, SIPCOT INDUSTRIAL COMPLEX RANIPET 632 403, TAMILNADU, INDIA PHONE: +91 – 4172 – 244441, 2, 6, FAX +91 – 4172 – 244308

E-MAIL: mail@thirumalaichemicals.com

Date: 01 January 2016

Brief Manufacturing Process / Process Flow Diagram / Route of Synthesis – DL Malic Acid



MUMBAI OFFICE: "THIRUMALAI HOUSE", Plot No. 101-102, Road No. 29 Sion (East),

MUMBAI – 400 022, Maharashtra, INDIA.

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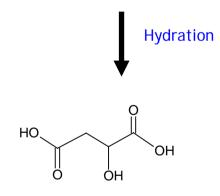
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Brief Manufacturing Process:

DL Malic acid is manufactured by the hydration of Maleic acid.

Reaction Scheme:

Maleic Acid Maleic Anhydride **DM Water**



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E-MAIL: mail@thirumalaichemicals.com

DL Malic Acid

Signature:

Name: B.K. Bama

Designation: Head - Quality Assurance

Company Seal:



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> E-Mail: thirumalai@thirumalaichemicals.com Web site: http://www.thirumalaichemicals.com



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Responsible Care

TO WHOM SO EVER IT MAY CONCERN

We herewith confirm that the product DL - Malic acid manufactured by Thirumalai Chemicals Limited, Based on HACCP process risk assessment, we have implemented our process CCP and CCL and described below.

Plant:		Malic Acid Plant				
Description of CCP	Target Limit		Action Limit	Control Limit	Frequency of	Record
1.Reactor			183°C to 184 °C	180°C to 182°C	Every Batch	CCP Register
Temperature (During Hydration)	185°C 195°C		196°C to 197°C	198°C to 200°C		
2.Purification process - MAC Content	0.3 % , Max		0.4 %, Max	0.5 %, Max	Daily	CCP Register

Signature:

Name: B.K. Bama

Designation: Head - Quality Assurance

Company seal:



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E-MAIL: mail@thirumalaichemicals.com

Date: 22-May -2017

To Whom So ever it may concern

Batch Number Coding

Product: DL Malic Acid & Fumaric Acid

The batch number is a four digit number. It is non repetitive. It is generated for each batch, which varies between 19 to 25 Tons. The batch numbering methodology is a part of traceability system. The batch number provides a way to find out the critical conditions (CCP) under which batch was produced, the specific details of Raw materials used, and the persons involved in the manufacturing.

The Month and year of manufacturing is given on each bag and all our CoA's have the Manufacturing date.

Signature:

Name: B.K. Bama

Designation: Head - Quality Assurance

Company seal:

Blesama



E-Mail: thirumalai@thirumalaichemicals.com Web site: http://www.thirumalaichemicals.com

