



DIMETHYLFUMARATE (DMFu)

Other Names DMF
2-butenedioic acid dimethyl ester
Dimethyl (E)- butenedioate

CAS Number **Substance**
624-49-7 Dimethylfumarate (DMFu)

May Be Found In

- Leather products
- Desiccant sachets and pads

Dimethylfumarate (DMFu) is used as a biocide to prevent mold during storage and transport of leather goods, such as footwear, in a humid climate.

Uses in the Supply Chain

DMFu is often placed in pads or desiccant sachets which is placed in the product or its packaging. It will evaporate over time and impregnate the leather, protecting it from mold which can cause the leather to deteriorate. It can also be applied directly to the surface of the product.

Why DMFu is Restricted

- Legislation in major markets around the world restricts the presence of DMFu in finished products.
- DMFu can cause painful dermatitis at low concentrations which can be difficult to treat. Symptoms may include itching, irritation, redness, and burns.
- DMFu in some cases can cause acute respiratory difficulties.
- Chemical hazard information for many chemicals can be found at the following external databases:
 - GESTIS Substance Database: [Here \(external link\)](#)
 - US National Library of Medicine: [Here \(external link\)](#)
 - US OSHA Occupational Chemical Database: [Here \(external link\)](#)

Sourcing Compliant Materials from Your Suppliers

- Contact your suppliers and explain that you require their manufactured materials to be compliant with the current AFIRM RSL limits.¹
- Require suppliers to submit a confirmation of material compliance or a test report from a third-party laboratory.
- When materials are received, consider performing risk-based testing to ensure the current AFIRM RSL limits are met.
- Share this information sheet with your material suppliers so they have full visibility and understand your sourcing requirements.
- Pay special attention to any active packaging such as desiccant sachets, to ensure they do not contain DMFu.

Sourcing Compliant Formulations from Your Chemical Suppliers

- For all formulations, request SDS documentation that meets current GHS requirements.
- Contact your suppliers and explain that you require formulations to be compliant with the current ZDHC MRSL limits whenever applicable.²
- Discuss with your chemical supplier whether any safer alternatives are available that are suitable substitutes for your production needs.



Chemical Information Sheet

Version 2.0 | March 2021

- Prior to procuring any formulation, the chemical properties must be reviewed to ensure that proper protective equipment, chemical storage facilities, facility engineering controls, and associated treatment/disposal facilities are appropriate for the chemical(s).

Safer Alternatives

The following substances have been identified as examples of safer alternatives and may be suitable for your production needs.

- DMFu-free desiccant sachets or pads are available from several suppliers.
- Depending on Brand requirements, it may be acceptable to use biocidal substances that are approved for use as Product Type 9 of the European Union Biocidal Products Directive. This includes quaternary ammonium compounds (with a silyl function) and polyhexamethylene biguanide (PHMB).³
- Any chosen alternative must be ZDHC MRSL compliant whenever applicable.

Additional Information

Visit ECHA's Candidate List of substances of very high concern to view dossiers for many restricted substances

<https://echa.europa.eu/candidate-list-table>.

References

¹ Apparel and Footwear International RSL Management Group Restricted Substances List (AFIRM RSL) <http://afirm-group.com/afirm-rsl/>

² ZDHC Manufacturing Restricted Substances List (ZDHC MRSL) https://www.roadmapzero.com/mrsl_online/

³ European Union Biocidal Active Substances – <https://echa.europa.eu/information-on-chemicals/biocidal-active-substances>