



PRODUCT DATA SHEET

EsoDant 510

DMDM HYDANTOIN & CMIT / MIT

(INCI: DMDM HYDANTOIN, METHYLCHLOROISOTHIAZOLINONE, METHYLISOTHIAZOLINONE)

EsoDant - 510

Product Code FP043 | INCI : DMDM Hydantoin, Methylchloroisothiazolinone, Methylisothiazolinone

Description : EsoDant - 510 is a broad-spectrum, water-soluble preservative blend of DMDM Hydantoin and the Methylchloroisothiazolinone / Methylisothiazolinone (3 : 1) system. The two chemistries act by independent mechanisms and are strongly synergistic: the formaldehyde donor provides sustained activity against Gram-negative and Gram-positive bacteria, while the isothiazolinone component delivers rapid kill at very low concentration against yeast, mould and organisms that have adapted to formaldehyde donors. The combination gives dependable, cost-effective preservation at low use levels. EsoDant - 510 is intended for rinse-off personal care products and for home care and industrial formulations; it is not permitted in leave-on cosmetics in the European Union or Japan.

Features and Benefits

EsoDant - 510 demonstrates the following features and benefits:

- Strong broad-spectrum efficacy against bacteria, yeast and mould
- Two independent modes of action in a single, synergistic blend
- Active against formaldehyde-resistant and isothiazolinone-resistant organisms
- Very low cost-in-use
- Vapour phase activity from the formaldehyde donor component
- Fully effective in anionic, cationic and non-ionic systems
- Clear, colourless aqueous liquid - easy to handle, dose and incorporate
- Soluble in water and compatible with most common raw materials
- Suitable for neutral pH rinse-off applications

Application / Use EsoDant - 510 protects water-based formulations against microbiological spoilage during storage and in use. Recommended applications:

Personal Care - rinse-off only

- Shampoos and conditioners
- Body washes and shower gels
- Liquid hand soaps
- Makeup removers
- Rinse-off hair treatments
- Face and body scrubs

Home Care & Industrial

- Manual dishwash liquids
- Laundry detergents
- Fabric softeners
- Surface and floor cleaners
- Window / glass cleaners
- Industrial cleaning formulations

Physical properties and Product Specifications

Clarity Clear
Appearance Colourless liquid
Odour Characteristic
pH 3.0 - 6.0
Total Formaldehyde 8.0 - 9.0 %
CMIT / MIT (3 : 1) 0.25 - 0.31 %

Chemical Identification	CTFA / INCI Name	CAS Number	EINECS Number
Active Ingredients			
DMDM Hydantoin		6440-58-0	229-222-8
Methylchloroisothiazolinone		26172-55-4	247-500-7
Methylisothiazolinone		2682-20-4	220-239-6
CMIT / MIT mixture (3 : 1)		55965-84-9	—
Inert Ingredients			
Water		7732-18-5	231-791-2

Each batch of EsoDant - 510 is produced to exact specifications and a certificate of analysis is provided with each order. The above is presented as typical composition and does not constitute specifications.

Formulating Considerations

The microbiological performance of EsoDant - 510 in rinse-off personal care and home care products is excellent. Because the isothiazolinone component is sensitive to heat, pH and nucleophiles, the guidance below should be followed closely, and compatibility confirmed in the development of new products.

Typical Use Levels - EsoDant - 510 is typically used at 0.10 - 0.40 % by weight in rinse-off personal care products and at 0.03 - 0.20 % in home care formulations. In the European Union the use level must not exceed 0.48 %, which corresponds to the maximum permitted CMIT / MIT concentration of 0.0015 % in the ready-to-use rinse-off product; at the recommended maximum of 0.40 % the contribution is approximately 0.0012 %. The optimum level depends on the initial microbiological load, the components of the system and its temperature and pH. Because formulations vary, the manufacturer should confirm the efficacy and stability of EsoDant - 510 in use by challenge testing.

Addition to the Formulation - EsoDant - 510 is a liquid product that is easily incorporated into water-based systems. Add it as late as possible in the production process, into the water phase or the finished batch, under good agitation to achieve homogeneous distribution.

Effect of Temperature - The maximum manufacturing temperature is 40°C. The isothiazolinone component degrades progressively above this temperature and preservative efficacy will be lost. Where a process requires heating, add EsoDant - 510 only after the batch has cooled below 40°C.

Effect of pH - EsoDant - 510 is stable and effective over the pH range 3 - 8 and is well suited to neutral pH rinse-off systems. Above pH 8 the isothiazolinone component hydrolyses and activity falls, so keep the finished product below pH 8.

Compatibility - EsoDant - 510 is fully effective in anionic, cationic and non-ionic systems and is compatible with most raw materials used in rinse-off and home care products. Avoid strong oxidising and reducing agents, sulphites and bisulphites, amines and amine derivatives, and other nucleophiles, which deactivate isothiazolinones.

Spectrum of Activity

The two actives cover each other's gaps. DMDM Hydantoin releases formaldehyde slowly and is particularly effective against Gram-negative bacteria including *Pseudomonas* species. CMIT / MIT is active at parts-per-million level across bacteria, yeast and mould, and reaches organisms adapted to formaldehyde donors. Together they cover the USP <51> and EP 5.1.3 panel:

- *Pseudomonas aeruginosa*
- *Escherichia coli*
- *Staphylococcus aureus*
- *Candida albicans*
- *Aspergillus brasiliensis*
- Formaldehyde-resistant strains

Regulatory Status

EsoDant - 510 is approved for rinse-off applications, subject to the following regional limits:

Europe

- CMIT / MIT (3 : 1) is listed in Annex V, entry 39 of Regulation (EC) No 1223/2009, rinse-off only, at a maximum of 0.0015 % in the finished product
- DMDM Hydantoin is listed in Annex V at a maximum of 0.6 %
- Not permitted in leave-on cosmetic products
- Maximum recommended EsoDant - 510 use level: 0.40 %

Americas

- Rinse-off: maximum 0.6 % DMDM Hydantoin and 0.0015 % CMIT / MIT
- Leave-on: maximum 0.6 % DMDM Hydantoin and 0.00075 % CMIT / MIT

Asia

- Japan - Rinse-off: maximum 0.3 % DMDM Hydantoin and 0.01 % CMIT / MIT
- Japan - Leave-on: not permitted, nor in oral hygiene or lip products, nor in preparations for children under three years of age

Home Care Notified under BPR (EU) No 528/2012, Product Type 6 (in-can preservatives)

Regulations are subject to revision. Confirm the status of each component against current local regulation before placing a finished product on the market.

**Handling,
Storage, and
Disposal**

Store in a cool and dry place away from heat and direct sunlight, in tightly closed original containers. Shelf life 12 months from the date of manufacture when stored as directed.

Health and Safety

EsoDant - 510 contains isothiazolinones, which are skin sensitizers, and releases formaldehyde in use. Handle with appropriate personal protective equipment and avoid contact with skin and eyes. Please refer to the Safety Data Sheet (SDS).

Recommended Use Levels

Application	EsoDant - 510 in the finished product
Shampoo, shower gel, body wash	0.10 - 0.30 %
Liquid hand soap, conditioner, makeup remover	0.10 - 0.30 %
Manual dishwash liquid	0.05 - 0.15 %
Laundry detergent	0.05 - 0.15 %
Fabric softener	0.03 - 0.10 %
Surface, floor and glass cleaners	0.05 - 0.20 %

Recommended use levels are guideline starting points only. It is the responsibility of the customer to establish stability and preservative efficacy in the final formulation, by challenge testing to USP <51> or EP 5.1.3, and to confirm that the resulting CMIT / MIT concentration complies with local regulation.

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