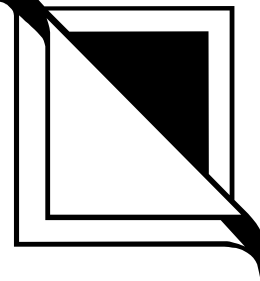


Grafix Cellulose Acetate

Material Safety Data Sheet

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1. Identification of the substance and company.

- 1.1 Product name: Grafix Acetate
- 1.2 Chemical name: Cellulose Diacetate
- 1.3 Manufacturer's name and address
 - Grafix
 - 5800 Pennsylvania Ave.
 - Maple Heights, OH 44137
- 1.4 Telephone number (for MSDS assistance and technical information): 216-581-9050

2. Composition/information on ingredients.

A flexible packaging material derived largely from natural resources. Materials of this type have been widely used for many years, with no adverse reactions reported. The principle components, cellulose diacetate (CA) and diethyl phthalate (DEP), have not changed over this period.

3. Hazards identification.

- 3.1 Potential Hazards
 - Clear, smooth flat sheets: (similar safety hazards to paper).
- 3.2 Fire and Explosion Hazard
 - Supports combustion. Flame retardant formulations are available.
- 3.3 Decomposition Products
 - Carbon monoxide, carbon dioxide, acetic acid, water.

4. First-aid measures.

- 4.1 Inhalation
 - Not applicable
- 4.2 Skin contact
 - No adverse effects anticipated
- 4.3 Eye contact
 - No adverse effects anticipated
- 4.4 Ingestion
 - No adverse effects anticipated
 - No adverse effects expected on prolonged exposure.

5. Fire-fighting measures.

- 5.1 Extinguishing Media
 - Water, carbon dioxide, foam, dry powder, sand.
- 5.2 Special Fire Fighting Procedure
 - As with any fire, use breathing apparatus in presence of smoke/fumes.

Grafix

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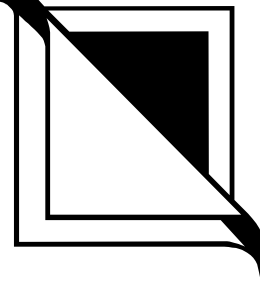
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6. Accidental release measures.

- 6.1 Steps to be taken if material is spilt.
Loose waste and scrap material should be swept up for safe disposal.

7. Handling and storage.

7.1 Handling

When moving pallets of material, always ensure the "forks" of the fork lift truck are long enough to cover the complete base of the pallet. This will ensure the even distribution of the forces throughout the packaging. Avoid damage to the edge of the roll. **NEVER** stand rolls on end, avoid placing or rolling rolls on the floor. Handle rolls using mandrels inserted into the core. Store by suspending on racks using mandrels. do not hammer mandrels into the core.

7.2 Storage

Decades of reliable performance have demonstrated that Grafix cellulose diacetate film can be used in its many applications with the confidence that the product provides a consistently high level of quality. However, cellulose diacetate, like all polymers, must be stored appropriately to preserve its performance.

- Avoid wide variations in temperature and humidity in the storeroom. Temperatures between 15°C - 23°C (59°F - 73°F) and a relative humidity between 40% - 65% are the best conditions.
- Avoid exposure to ketone and ester solvent vapors such as acetone or ethyl acetate.
- Do not store in bright sunlight.

7.3 Shelf Life

As a general rule, Grafix Acetate should be processed promptly. We would recommend that customers process Grafix Acetate within 12 months of its receipt. Particularly for hot and/or humid climates it may be advisable to convert Grafix Acetate within 6 or even 3 months of receipt. Some films will need to be processed in shorter periods to avoid problems. In particular, thicker films over 100µ may suffer unidirectional curl ("roll set") after even a few months storage as rolls. For applications where this might be critical, thicker films should be sheeted as soon as possible after receipt. In case of problems after such periods, Grafix reserves the right not to offer compensation in respect of problems arising with film quality.

8. Exposure controls/personal protection.

- 8.1 Special Requirements
None

8.2 Ventilation Requirements

Fume extraction and fresh air circulation is recommended where solvents are being used during lamination or other finishing processes.

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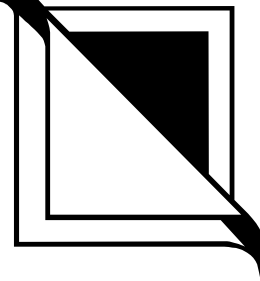
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9. Physical and chemical properties.

- 9.1 Appearance
Flat sheets or rolled film
- 9.2 Odor
Practically Odorless
- 9.3 Specific Gravity
1.31 ± 0.01
- 9.4 Flow Temperature
Not applicable
- 9.5 Viscosity
Not applicable
- 9.6 Solubility in Water
Insoluble
- 9.7 Equilibrium Water Content
Circa 2% (in air @ temp. 23°C, RH 50%)

10. Stability and reactivity.

- 10.1 Thermal Stability
Decomposes circa 250°C
- 10.2 Solvent Resistance
Low resistance to ketones and esters Attacked by moderate to concentrated strong acids and bases. Resistant to non-polar solvents.

11. Toxicological information.

Material of this type has been in use for many years. There have been no chronic, short- or long-term effect reported. Specific toxicological tests on Grafix Acetate films have not been conducted. However, practical experience and literature surveys for the key components reveal the following information:-

- 11.1 Inhalation
Not applicable
- 11.2 Ingestion/Oral Toxicity (LD50)
8600 mg/kg (rat) for Cellulose diacetate 9000 mg/kg (rat) for DEP
- 11.3 Skin sensitivity
No adverse effects anticipated
- 11.4 Eye contact
Normal discomfort resulting from foreign bodies in the eye.

12. Ecological information

- 12.1 Raw Materials and the Manufacturing Process.
Over 80% of Grafix film is cellulose diacetate. This is derived from natural cellulose sources, cotton linters and wood pulp, from managed forests predominately in North America. We use no hardwoods from endangered rain forests.

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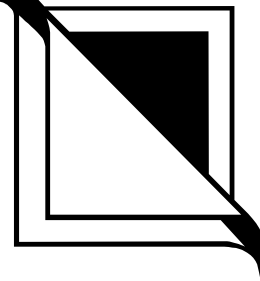
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12.2 Mobility and Degradability.

Biodegradation studies indicate around 15% (by wt) of Grafix film is lost over 28 days. This is thought to be largely due to DEP biodegradation. The two primary constituents of Grafix film (cellulose diacetate and DEP) have long since been recognized as biodegradable.

12.3 Recycling.

Grafix Acetate is suitable for recycling in various forms.

13. Disposal considerations

Grafix Acetate can be recycled, incinerated or land filled. There are no known dangers resulting from these methods of disposal. Incineration produces no toxic by-products.

14. Transport information

The material is not regulated for transport and shipping purposes. Materials packed on pallets should not be broken down during shipment.

15. Regulatory information

None

16. Other information

16.1 Food Contact.

- Grafix Acetate films comply with US FDA Regulations as set out in CFR 21, parts 170-199.
- Grafix Acetate films comply with EC Directives 90/128/EEC, 92/39/ECC, 93/9/EEC, 95/3/EEC, and 96/11/EEC and are classified as being suitable for food contact applications.

16.2 Heavy Metals.

No heavy metals are used in the manufacture of Grafix Acetate. The resulting film complies with U.S. - CONEG legislation, and European Standard EN71-3, the Packaging (Essential Requirements) Regulations (1998). Every effort has been made to ensure that the above information is correct and in accordance with current knowledge. While responsibility for errors or omissions cannot be accepted, the Company will endeavour to supply information on any of its products on request.

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