

Health and Safety Guidelines for the use of Propafilm™ Biaxially Oriented Polypropylene Films (BOPP)

Introduction

- The information below should be studied carefully and its contents drawn to the attention of, and made available to, all relevant personnel before the product is handled.
- Propafilm™ BOPP films do not present any specific hazards to health or safety when used for their intended purposes in accordance with good industrial, hygiene and housekeeping practices.
- The Propafilm™ range of BOPP films fall into the following categories:
 - i) Co-extruded films
 - ii) Polyvinylidene chloride (PVdC) copolymer coated films
 - iii) Acrylic coated films
 - iv) Differentially coated films
 - v) Fast seal coated films

Food contact

- For specific details of Food Contact Compliance relating to Propafilm™ products please contact our Technical Services Department.

Ingestion

- Propafilm™ BOPP films are non-toxic. However in the unlikely event of ingestion of polypropylene film, flake or dust particles it is recommended that medical advice is sought.

Inhalation

- Polypropylene powder is considered to be a chemically inert low toxicity dust not normally dangerous to health, although high concentrations in the air may cause a nuisance. Airborne concentrations must be kept below the normal recommended levels for inert powders.
- The UK Health and Safety Executive and the American Conference of Government Industrial Hygienists (ACGIH) quote Occupational Exposure Limits (OEL) of 10 mg/m³ 8-hour Time Weighted Average (TWA) for total inhalable dust and 5 mg/m³ 8-hour TWA for respirable dust.
- In the event of a process creating significant quantities of polypropylene flake or dust particles, precautions must be taken to avoid inhalation and the use of a filter mask may be advisable. In cases where inhalation of polypropylene flake or dust particles occurs, remove the patient to fresh air and seek medical advice.

Eye Contact

- Polypropylene flake or dust particles are not dangerous, but may cause eye irritation due to their mechanical action. In the event of a process creating polypropylene flake or dust particles, eye protection is advised. In cases where polypropylene flake or dust particles contact the eyes, flush with water. If eye irritation persists, seek medical advice.

Skin Contact

- Isolated cases of dermic symptoms have been associated with personnel handling plastic films, and have been attributed to a very rare form of allergy. The use of barrier creams and protective gloves can usually eliminate such problems, but in extreme cases the personnel concerned should be removed from the environment and seek medical advice. The occurrence should then be advised to our Technical Services Department.

Fire Risks

- If polypropylene films are involved in a fire they will ignite and continue to burn freely provided sufficient oxygen is present and even if the source of ignition is removed.

N.B. The minimum ignition temperature of BOPP film is 380°C (716°F).

- Molten droplets of polymer can be produced which could ignite adjacent flammable and/or combustible materials.
- Skin or clothing contaminated by molten polymer should be drenched with clean cold water until cool. In the case of the former refer the patient for immediate medical attention. Under no circumstances attempt to peel the solidified polymer off the skin.
- BOPP films generate little smoke when burning under conditions of free air supply. The major constituents of the fumes evolved are:
 - i) Coextruded films – water vapour, carbon dioxide and carbon monoxide.
 - ii) Polyvinylidene chloride (PVdC) copolymer coated films – water vapour, carbon dioxide, carbon monoxide, hydrogen chloride and oxides of nitrogen.
 - iii) Acrylic coated films – water vapour, carbon dioxide, carbon monoxide and oxides of nitrogen.Carbon monoxide and certain nitrogen oxides are toxic and hydrogen chloride is corrosive. Care should therefore be taken not to inhale these decomposition fumes evolved during a fire involving BOPP films.
- Fires involving BOPP films can be dealt with using any commonly available fire extinguisher, although restrictions may be imposed by the presence of other materials such as flammable solvents or electrical equipment. It is advisable in such situations to obtain advice from the local Fire Authority.
- BOPP films should not be used for decorative purposes in areas prone to fire risk.

Explosion Risk

- Do not allow any accumulation of polypropylene powder. If a process generates polypropylene powder, extreme care must be taken not to accumulate electrostatic charge or any other source of ignition. In such cases expert advice should be sought on this matter. The explosion limit of polypropylene powder in air is 0.02 g/L.

Film Storage

- No special conditions are required for the storage of Propafilm™ BOPP films but it is strongly recommended that dry conditions below 30°C (85°F) are employed to minimise any deterioration of the properties.
- Most Propafilm™ BOPP films are suitable for use 6 months from the date of delivery, please refer to the data sheet for specific grades. Film stocks should be used in rotation according to dates of delivery. It is also recommended that film should be allowed to reach normal operating room temperature for 24 hours before use.

Film Packaging

- Pallets of film should only be moved by trained operators using mechanical handling equipment designed for the weight and dimensions of the pallets in use. Racking should be used wherever possible.
- The stacking of film pallets on top of each other is not recommended. The stacking of cradles more than three high is not recommended. It is appreciated however, that in some instances pallets are stacked by customers. In these situations the following guidelines should be rigidly adhered to:
 - i) The integrity of the packaging and strapping on each pallet should be checked to ensure that no damage has occurred in transit. Pallets which have any damage should not be moved or stacked until any damage is repaired (eg. re-strapping carried out).
 - ii) Only pallets/cradles of the same size, containing similar reels of films should be stacked.

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- iii) Pallets/cradles must be stacked squarely on top of one another.
 - iv) If reels are packed vertically, a maximum stack height of three pallets should be observed.
 - v) Never stack pallets with cradles.
 - vi) If reels are packed horizontally the recommended stack height should not exceed 3.5m (12 feet).
- Pallets should not be climbed on but properly approached and handled. Broken pallets should be handled with care and removed for repair or disposal.
 - Never lift more than one pallet/cradle at a time.
 - Pallets/cradles should never be pushed or pulled.
 - Pallet strapping is under tension and when cut will recoil exposing sharp corners. It is recommended that eye protection and protective gloves are worn at all times during cutting and handling of strapping.
 - Various materials are utilised in the packaging, overwrapping and protection of reels and pallets during transit and storage. Care should be taken in the handling and disposal of these materials, and the appropriate Health and Safety Guidelines should be observed.

Film Handling

- BOPP films can be slippery. Film should not be allowed to litter floors or obstruct access areas where personnel may walk or stand.
- Safety shoes should be worn at all times by personnel involved in the handling and movement of all film reels. The weights of individual reels that can be manually handled are limited by legislation.
- BOPP film reels and packs of sheets should be moved only with equipment designed for the purpose.

Converting Machinery

- Propafilm™ BOPP films can be printed using conventional solvents, adhesives and liquid ink systems, but Health and Safety precautions recommended by the suppliers should be strictly observed.
 - A degree of anti-static protection is incorporated in the formulation of specific Propafilm™ BOPP grades to aid processing and minimise the risk of ignition of solvent vapour by static discharge, and the likelihood of operators suffering static shocks. However it is advisable that anti-static equipment is fitted to machines, particularly in low humidity environments.
- Advice on suitable anti-static devices can be obtained from our Technical Services Department.

Heat Sealing

- Do not touch heat-sealed areas of film until cooled.
- During the heat-sealing of polyvinylidene chloride (PVdC) coated Propafilm™ BOPP films, very slight decomposition of the coating occurs, producing a faint odour of hydrogen chloride (HCl) close to the sealing area. This may cause a slight amount of corrosion of the heat-sealing surfaces.
- The UK HSE occupational exposure standard (OES) for HCl is 5 ppm (8 hours and 15 minutes TWA). The concentration in the working environment around the heat-sealing equipment will normally be much lower than this value, but adequate ventilation is recommended at all times.
- PVdC coated Propafilm™ BOPP films contain trace quantities of the residual co-monomers, vinylidene chloride with either methyl acrylate or acrylonitrile, which may be released during the heat-sealing

process. Analysis of atmospheric levels of these co-monomers has been conducted on wrapping machines and even under adverse conditions the values are much lower than current UK occupational exposure standard (OES).

- The UK Maximum Exposure Limit (MEL) for vinylidene chloride and acrylonitrile monomers are 10 ppm and 2 ppm respectively (8 hour Time Weighted Average (TWA)).

The Occupational Exposure Standard (OES) for methyl acrylate is 10 ppm (8 hour Time Weighted Average (TWA)).

- Acrylic coated films contain trace quantities of the residual acrylic monomer which may be released during the heat-sealing process. Analysis of atmospheric levels of the monomers has been conducted on wrapping machines and even under adverse conditions the values are much lower than current UK Occupational Exposure Standard (OES). Maximum Exposure Limits (MEL) for the monomers are available on request.

- For further details of exposure levels including their significance and application, please refer to the following literature:

- i) Threshold Limit Values, American Conference of Government Industrial Hygienists. (ACGIH)
- ii) Occupational Exposure Limits, Guidance Note EH40, UK Health and Safety Executive.

Both publications are subject to revision and the latest edition should be consulted.

Consumer Advice

- Discarded wraps of BOPP film may, if placed over the head, cause suffocation particularly in young children.
- BOPP films are unsuitable for direct use in cooking processes (including microwave ovens) unless specifically recommended for such use.

Disposal

- When disposing of any BOPP films, recycling should always be the first option, followed by incineration for energy recovery, before sending to landfill.
- Polypropylene is a recyclable thermoplastic that can be processed by virtually all common thermoplastic-processing methods and is capable of being reprocessed into granules and converted into a wide variety of other plastic products.
- The recyclability of the BOPP film in its final end application will depend upon how the film is used or converted and the availability of suitable recycling infrastructure within the geographical territory that the final packaged article is used in.
- Well managed incineration regenerates the energy content of the plastic material producing effectively non-toxic effluent, water and carbon dioxide (also small quantities of hydrogen chloride and nitrogen oxides from PVdC coated grades).
- It is recommended that modern incinerators involving high temperatures and long residence times within the combustion chamber be employed together with flue gas scrubbing techniques to meet the requirements of the regulatory emission control standards.
- Unprinted BOPP film is not classified as Special Waste under the UK Control of Pollution (Special Waste) Regulations 1980 and may be disposed of at approved landfill sites or by incineration under approved conditions in compliance with the requirements of the UK Control of Pollution Act 1974.
- Advice on the preferred method of disposal should be obtained from your Local Authority Waste Disposal Officer.

Customer Enquiries

- For advice or assistance with any matters relating to Health and Safety aspects of the use of Propafilm™ BOPP packaging films, please contact our Technical Services Department.

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