



Product Safety Data Sheet (PSDS)

for PALSHIELD™ Products

Update: December 2013

[Page 1 of 8]

This document covers safety data concerning the following products:

PALSHIELD™

Compliance with EU Regulation 1907/2006 (REACH)

The sheets manufactured by Palram are exempted from the requirement of the REACH regulation to provide customers with a Safety Data Sheet (EU No. 1907/2006, article 31) since they are defined as "articles." The information herein is provided by Palram as courtesy to its customers and a part of its service efforts. The sheets do not contain any substances on the candidate list for inclusion in Annex XIV of REACH above the threshold level of 0.1% by weight of the article.

1. Identification of the article and the company

1.1. Identification of the article

Trade Names : PALSHIELD™ (All products in range)
 Product Description : Rigid Acrylic/Polycarbonate layered Sheet, glued with Polyurethane.
 Material Name : Acrylic Copolymer/ Polycarbonate Homopolymer, Thermoplastic polyurethane
 CAS number : 9010-88-2, 25307-45-0
 UN number : None
 ACX number : X1008843-8, X1017917-2
 RTECS : TR0400000
 Material Synonyms : Acryloid; Methyl methacrylate, polymerized; PMMA; Methyl methacrylate homopolymer; Methyl methacrylate resin; Poly (methyl methacrylate)/Polycarbonate
 NFPA Ratings : For Acryl: Health=0, Fire=3, Reactivity=0/ For Polycarbonate: Health=0, Fire=1, Reactivity=0

1.2. Company Identification & Contact

Israel - Palram PVC	UK - Palram Polycarb	Americas - Palram 2000
Address: Ramat Yohanan, 30035, ISRAEL Tel: +972 4 8459 900 Fax: +972 4 8444 012	Address: Unit 2, Doncaster Carr Industrial Estate, White Rose Way Doncaster DN4 5JH, UK Tel: +44 1302 380738 Fax: +44 1302 380739	Address: 9735 Commerce Circle Kutztown, PA 19530, USA Tel: 610 2859928 Fax: 484 6478210

Local: Call your nearest poison control center.

2. Composition / Information of Ingredients

Ingredient name	CAS Registry Number	Typical wt%	OSHA Listed
Poly (Ethyl Acrylate/Methyl Methacrylate)	9010-88-2	70	N
Methyl Methacrylate	80-62-6	<0.7	Y
Polycarbonate	25307-45-0	21	N
Thermoplastic polyurethane	N.A	8	N

Pigments and additives used to enhance specific properties are encapsulated in the polymer resin matter.

No cadmium or other heavy metals based pigments or stabilizers used.

The substance marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Communication Standard (29 CFR 1910.1200).

3. Hazards identification

No particular hazards known.

3.1. Health Hazard Data

3.1.1 Effects of a Single Overexposure

Swallowing : non-relevant

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[Page 2 of 8]

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PALSHIELD™

Skin Absorption : non-relevant
Inhalation : inhalation of monomer vapor from heated product can cause: irritation of nose, dizziness – headache - nausea
Skin Contact : monomer vapors from heated product can cause: irritation
Eye Contact : monomer vapors from heated product can cause: irritation

3.1.2 Effects of a Repeated Overexposure - See Health Hazards

3.1.3 Medical Conditions Aggravated By Overexposure - None currently known

3.1.4 Other Effects Of Overexposure - None currently known

4. First Aid Measures

In general handling the material will not cause accidents.

4.1. Inhalation

Route of entry – inhalation: No

If exposed to monomer vapors or combustion fumes in high concentration - bring victim to fresh air. Medical attention needed.

For PU: Loosen tight clothing such as a collar, tie, belt or waistband.

4.2. Ingestion

For PMMA/Polycarbonate: Route of entry – ingestion: No

For PU: Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air.

Keep the person warm and at rest. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if symptoms occur. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

4.3. Skin Contact

For PMMA: Burns resulting from accidental contact with molten material must be flushed immediately with cold water.

Do not remove the polymer from the skin. Do not use solvent for removal. Medical attention needed.

For PU: Molten material can cause severe burns. Do NOT try to peel molten polymer from the skin. Cool rapidly with water. Wash with soap and water. Get medical attention if symptoms occur.

4.4. Skin Absorption

Route of entry – skin: No

4.5. Eye Contact

For PMMA/Polycarbonate: Like any foreign body, can cause mechanical irritation. Remove contact lenses at once. Immediately flush eyes well with copious quantities of water or normal saline for at least 20-30 minutes. If irritation persists, consult physician.

For PU: Particles or fibres may cause slight discomfort similar to getting dust in the eye. Remove particles by irrigating with eye wash solution or clean water, holding the eyelids apart. Check for and remove any contact lenses. Get medical attention if irritation occurs.

4.6. Notes for Physician

There are no specific notes.

For PU: Symptomatic treatment and supportive therapy as indicated.

5. Fire Fighting Measures

This material as sold is combustible; burns vigorously with intense heat. When forced to burn it will produce a sooty fire. Main products of combustion are carbon dioxide and carbon monoxide. Monomer vapours may be present.

5.1. Extinguishing Media

Water spray or foam, dry chemicals, CO₂ (is less recommended due to lack of cooling capacity).

5.2. Extinguishing Media to Avoid

No information currently available.

5.3. Special Fire Fighting Procedures

As in any fire, personnel without suitable respiratory apparatus should leave the affected area to prevent exposure to toxic or combustible gases.

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[Page 3 of 8]

This document covers safety data concerning the following products:

PALSHIELD™

5.4. Special Protective Equipment For Firefighters

Positive-pressure self-contained breathing apparatus, protective clothing, gas mask approved for acid vapors.

5.5. Unusual Fire and Explosion Hazards

For PMMA: Hazardous combustion products may include intense heat, dense black smoke, carbon dioxide, carbon monoxide and hydrocarbon fragments. Soot emitted when acrylic is forced to burn may obscure visibility.

Heated material can form flammable vapors with air.

The material is not sensitive to static discharge.

Static electricity discharge sparks possible at handling – avoid vicinity of static discharge sensitive materials.

For Polycarbonate: Hazardous combustion products may include intense heat, dense black smoke, carbon dioxide, carbon monoxide and hydrocarbon fragments. Combustion products/processing fumes may include trace levels of phenol, alkylphenols, and diarylcarbonates. Soot emitted when Polycarbonate is forced to burn may obscure visibility.

During combustion the base resin does not produce hydrogen cyanide, phosgene, acrolein, hydrogen chloride or sulfur dioxide.

The material is not sensitive to static discharge.

Static electricity discharge sparks possible at handling – avoid vicinity of static discharge sensitive materials

For PU: Unlikely under normal industrial use. If the product is heated to 20 Deg C above recommended processing temperature, thermal decomposition is possible.

Combustion products may include: carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂ etc.), hydrocarbons, HCN.

6. Accidental Release Measures

FPr PMMA/Polycarbonate: No special precautions and no personal protective equipment needed. Collect mechanically for disposal.

For PU:

Personal precautions: Use suitable protective equipment. Hazard of slipping on spilt product.

Environmental precautions: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up: Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.

7. Handling and Storage

7.1. Handling

General handling precautions

For PMMA/Polycarbonate: Avoid mechanical contact with eyes. Use good industrial hygiene practices. Provide adequate ventilation. Secondary operations such as grinding, sanding or sawing may produce a dust explosion hazard. Use aggressive housekeeping activities to prevent dust accumulation; employ bonding, grounding, venting and explosion relief provisions in accordance with accepted engineering practices.

For PU: Wear suitable protective clothing. Wash thoroughly after handling. Burns are the most common injury during melt processing of thermoplastics. Take utmost care.

Ventilation

General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled.

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Update: December 2013

[Page 4 of 8]

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PALSHIELD™

Other precautions

No explosion hazard. In the event of fire, cool and overlap product with water.

The material is not sensitive to static discharge. Static electricity discharge sparks possible during handling. Avoid contact or vicinity of flammable materials.

7.2. Storage

For PMMA/Polycarbonate: This material is not hazardous under normal storage conditions. However, all materials of this type release some monomer vapors or gases when stored for prolonged periods at elevated temperatures. Avoid temperature extremes during storage; ambient temperature preferred.

For PU: Keep container tightly closed in a cool, well-ventilated place.

8. Exposure Controls / Personal Protection

8.1. Exposure Limits

Airborne Exposure Guidelines for Ingredients - Methyl Methacrylate

Exposure Limit	Value
ACGIH Sensitizer designator	Y
ACGIH STEL	100 ppm (410 mg/m ³)
ACGIH TWA	50 ppm (205 mg/m ³) – averaged over 8 hour work shift
OSHA TWA PEL	100 ppm (410 mg/m ³) – averaged over 8 hour work shift
NIOSH TWA	100 ppm (410 mg/m ³) – averaged over 10 hour work shift

- Only those components with exposure limits are printed in this section.
- Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.
- ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.

8.2. Personal Protection

Respiratory protection : Not required under normal processing conditions. When airborne exposure limits are exceeded (see above), use NIOSH approved respiratory protection equipment. Consult respiratory manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full-face positive-pressure, self-contained breathing apparatus.

Hand protection / protection gloves : No special protection needed

Eye protection : No special protection needed

Other protective equipment/measures : No special protection needed

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Update: December 2013

[Page 5 of 8]

This document covers safety data concerning the following products:

PALSHIELD™

9. Physical Properties

For PMMA:

Appearance	:	Clear flat sheet
Physical State	:	Solid
Color	:	Clear
Odor	:	None
Density	:	1.15-1.20 gr/cm ³
Softening Temperature	:	Approximately 103oC
Viscosity	:	Not relevant
Solubility In Water	:	None
pH Value	:	Not relevant
Flash Point	:	>250oC ASTM D 1929
Autoignition Temp.	:	>400oC ASTM D 1921
Flammability Limit	:	None
Explosion Limits	:	None
Evaporation Rate	:	Not relevant

For Polycarbonate:

Appearance	:	Flat plastic sheets
Physical State	:	Solid
Color	:	Clear
Odor	:	None
Density	:	1.2 gr/cm ³
Change In State	:	Tg=140-150°C,
Boiling Point, 760 Hg	:	None
Viscosity	:	Not relevant
Solubility In Water	:	None
Ph Value	:	Not relevant
Flash Point	:	>450oc ASTM D 1929
Autoignition Temp.	:	>650oc ASTM D 1921
Flammability Limit	:	None
Explosion Limits	:	None
Evaporation Rate	:	Not relevant
Percent Volatiles	:	Not relevant

10. Stability and Reactivity

10.1. Stability

Stable.

Conditions to avoid

Open flame. Avoid temperature above 250°C for prolonged periods to prevent slow decomposition.

Incompatible materials

Avoid contact with acids, alkalies and strong oxidizing agents..

Thermal decomposition

During thermal decomposition caused by fire or overheating during improper processing combustible irritating vapours are formed consisting mainly of methyl methacrylate, which affect the eyes and respiratory system.

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Update: December 2013

[Page 6 of 8]

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PALSHIELD™

Hazardous decomposition products

- Carbon monoxide (CO) - is highly toxic if inhaled, present in combustion fumes of all organic materials;
- Carbon dioxide (CO₂) - in sufficient concentrations can act as an asphyxiant, present in combustion fumes of all organic materials;
- Acrylic monomers - can cause irritation of skin, eyes, nose, throat, and lungs – dizziness – headache – nausea

10.2. Reactivity

- Hazardous polymerization : Will not occur
- Hazardous reactions : None.

11. Toxicological Information

Independent testing and many years of experience confirm that this material has very low toxicity. The International Agency for Research on Cancer does not list this material as a confirmed or suspected carcinogen. Industrial hygiene studies have shown that under normal and expected conditions of use of PMMA materials, exposures are well below applicable limits.

11.1. Acute Toxicological Information

For PMMA:

- Acute oral toxicity : Oral LD50 (rat) > 5g/kg, estimated.
- Acute vapor exposure : product is not toxic. For processing fumes see Health Hazard Data.
- Primary skin irritation : product not considered primary skin irritant.
- Eye irritation : product not considered primary irritant. When similar products, in finely divided form, were placed into the eyes of rabbits, slight transient redness or discharge occurred – consistent with the expected slightly abrasive nature of product.
- Sensitization : product is not expected to be a skin sensitizer.
- Chronic effects : in sub-chronic testing, the base resin was considered physiologically inert.
- Carcinogenicity - NTP : not tested
- IARC : not listed
- OSHA : not regulated
- Explanation Carcinogenicity : Not relevant

11.2. Other Toxicological Information

No known toxicological effects with normal use. For heating see Section 10.

11.3. Additional Information

No additional toxicity information is currently available.

12. Ecological Information

12.1. Persistence and Degradability

Detailed studies have not been conducted concerning the environmental fate of the product. According to present knowledge no unfavorable ecological effects are to be expected. Not generally hazardous to water. Insoluble in water, non-toxic solid.

- Mobility : No information currently available
- Persistence and biodegradability : Biodegradation period - tens of years.
- Bioaccumulative potential : No information currently available.

12.2. ENVIRONMENTAL RISCS

No hazard expectation to terrestrial or aquatic flora and fauna.

- Ecotoxicity : LD50 (rats) > 5 gr/kg
- : IC50 (bacterial inhibition) - no data available
- Aquatic toxicity : LC50 (daphnia magna) - no data available
- : LC50 (fathead minnow – fish) - no data available

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Update: December 2013

[Page 7 of 8]

This document covers safety data concerning the following products:

PALSHIELD™

12.3. Other Information

All available ecological data have been taken into account for the development of the hazard and precautionary information contained in this product data.

13. Disposal Considerations

The product is not considered hazardous under current EPA hazardous waste regulations. Recycling is the preferred method of disposal.

Alternatively, the product may be disposed of in an approved landfill.

Incineration in accordance with federal, state and local regulations – collected processing fume condensates and incinerator ash should be tested to determine waste classification.

All wastes should be evaluated in conjunction with applicable solid and hazardous waste regulations, Toxicity Characteristic Leaching Procedures (TCLP), and disposed of as appropriate. This product does not contain any cadmium or other heavy metal pigments or stabilizers.

It is the user's responsibility to dispose of all wastes in accordance with all national and local regulations at properly permitted or authorized facilities.

14. Transport Information

DOT PSN Code : ZZZ
 DOT Proper Shipping Name : Not regulated by this mode of transportation
 IMO PSN Code : ZZZ
 IMO Proper Shipping Name : Not regulated by this mode of transportation
 IATA PSN Code : ZZZ
 IATA Proper Shipping Name : Not regulated by this mode of transportation
 AFI PSN Code : ZZZ
 AFI Proper Shipping Name : Not regulated by this mode of transportation
 Additional transportation data : Not currently regulated under Department of Transportation regulations
 Labeling : No labeling is required in accordance with the EEC directives
 Placarding : No placarding is required in accordance with the EEC directives
 Special transport requirements : None
 Packaging : Avoid dark-colored packaging to prevent heat distortion
 The product is classified as a non-hazardous material in the meaning of transport regulations.

15. Regulatory Information

United States: All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

EEC:

Ingredient name	CAS Registry Number	EINICS
Poly(Ethyl Acrylate / Methyl Methacrylate)	9010-88-2	
Methyl Methacrylate	80-62-6	2012971

Indicator of Danger: This product isn't hazardous according to EEC Directives 548/67/EEC and 379/88/EEC

With regards to dust formed as a consequence of mechanical treatments, the appropriate regulations value limits for fine dust must be observed: MEC value (fine dust) – 5mg/m3.

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[Page 8 of 8]

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16. Other Information

Recommended Uses and Restrictions

Please consult the relevant product and/or application information for this product.

Further Information

Additional information on this product may be obtained by calling your PALRAM Sales or Customer Service contact.

Disclaimer

Palram believes that the information and recommendations contained (including data and statements) in this PSDS are accurate as of the date hereof. This PSDS is based on information that is believed to be reliable, but may be subject to change as new information becomes available. Since it is not possible to anticipate all conditions of use, additional safety precautions may be required. The information is neither designed nor recommended for any other use than as safety data or for use by any other person than the direct user and not for compliance with other laws. Palram does not warrant the suitability for use of this PSDS for any other material or product not specifically identified herein, nor the accuracy or authenticity of this PSDS unless it has been obtained directly from Palram.

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