

HYG Products

Active Antimicrobial
Protection 24/7

PVC Panels with Active
Antimicrobial Protection



HYG Products

| Contents | Page |
|--|-------|
| Introduction to HYG Products | 2 |
| Main Benefits | 2 |
| Applications | 3 - 4 |
| Product Availability | 5 |
| Color | 5 |
| Standard PALOPAQUE™ Dimensions | 6 |
| HYG Profile System for Cladding | 6 |
| Resistance to Chemicals | 6 |
| Flammability | 6 |
| Lab Test Microbe Elimination on Sample Sheets | 7 |
| Field Test Comparison of Cladding in Operating Theatres | 9 |
| Field Test Comparison of Work Surfaces in a microbial Laboratory | 10 |
| Certification | |
| Contact with Foodstuff | 11 |
| PALOPAQUE™ Flammability | 14 |
| MSDS - Material Safety Data Sheet | 15 |
| Installation Guidelines | 20 |

Introduction to HYG Products

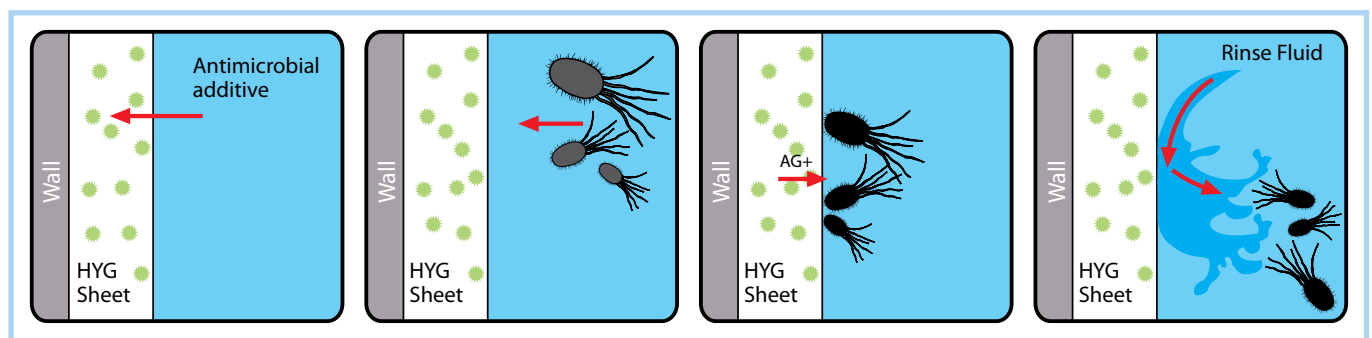
HYG Products add a new quality to your facility with: active antimicrobial action.

Regulatory authorities are raising the hygienic standards for food plants, medical facilities, food services, restaurant kitchens, slaughterhouses, and more. Hospitals are increasingly concerned about controlling the spread of opportunistic antibiotic-resistant bacteria. These efforts demand unique construction materials for covering walls and ceilings, as well as for forming the HVAC ducting that circulates the air through these facilities. An innovative technology from PALRAM is now setting a new standard in hygienic cladding, - an active antimicrobial cladding with less maintenance needed. Breakthrough HYG products incorporate silver ions, a natural antimicrobial agent with proven biocidal behavior that stops the microbes reproduction. With silver ions, HYG products bring active microbe elimination to a whole range of applications, taking hygiene care one step further.

PVC is the preferred sheet material for a number of reasons. It is highly resistant to the strongest chemicals and cleaning agents, highly fire resistant and typically qualifies for installation certification.

Palopaque HYG have either killed or inhibited the growth of all the pathogens tested to date (See pages 7-11). This includes microorganisms that can affect the appearance of the sheet. Since silver ions are uniformly distributed throughout the sheet, a scratched or damaged surface will be equally effective. Palopaque HYG require less frequent cleaning and enables the use of less concentrated or more economical cleaning agents, thereby reducing maintenance costs. This highly efficient solution for microbe-sensitive areas is now offered as your HYG cladding.

Active Antimicrobial Action of HYG Products



Silver ions are incorporated into the bulk of the PVC mixture before the extrusion process, and improve the already existing antimicrobial activity of rigid PVC sheet. The sheet now kills a wide variety of microorganisms on contact, including those resistant to antibiotics.

Main Benefits

- Complete HYG cladding system
- Active antimicrobial protection - Kills microbes
- Long lasting effect of the antimicrobial action
- Proven biocidal capabilities as shown by independent tests (see pages 7-11)
- Resistance to a wide range of chemicals
- Withstands frequent cleaning
- Not digestible by bacteria (Rigid PVC)
- High fire resistance
- Allows for excellent adhesion
- Easy to install and maintain
- Keeps its HYG properties after processing
- PALRAM exclusive HYG profiles

HYG Products

Applications

HYG Products can be installed as cladding or roofing in a wide range of applications. Palopaque HYG can be thermoformed and fabricated into items intended for use in medical facilities, clean rooms, food processing plants and. It can also be used to manufacture microbicidal HVAC ducting, since circulated air is a significant factor in the transmission of pathogenic bacteria.

Public Facilities

- Schools
- Restrooms
- Airports
- Kitchens



Food Industry

- Food manufacturing facilities
- Sorting halls
- Storage/refrigeration rooms
- Food transporting trucks



Medical

- Sterile/clean rooms
- Hospitals
- Clinics
- Pharmaceutical factories



Agricultural

- Livestock, poultry and dairy farms
- Egg sorting halls
- Storage rooms
- Refrigeration facilities








HYG Products

Product Availability

HYG technology can be incorporated into a variety of PALRAM PVC products, subject to a minimum quantity order. **HYG Products** are currently available as PALOPAQUE flat sheets in standard thicknesses and dimensions. A complimentary HYG profile system completes PALOPAQUE HYG sheets for cladding purposes, achieving uniform appearance and a succession HYG protection. For information on other **HYG products** please contact your PALRAM distributor.






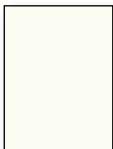
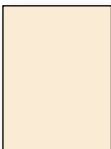
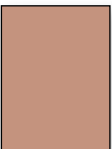




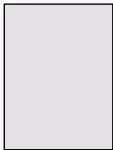




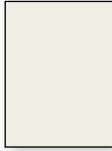


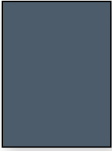





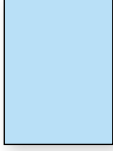



Colors

Standard Colors*

| | | | | | | |
|---|---|---|---|---|---|--|
|  |  |  |  |  |  |  |
| White | Beige RAL 1015 | Light Grey RAL 7040 | Dark Grey RAL 7015 | Black Soft RAL 9004 | Light Green PAN 331C | Light Blue PAN 291C |

*The printed colors and the indicated PANTONE® and RAL designations are the closest match. The indices are presented only to give an approximate indication. To view the exact color, please request a sample chip from your PALRAM distributor.

Designer Colors**

| | | | | | | | | | |
|---|---|---|---|---|---|--|---|---|---|
|  |  |  |  |  |  |  |  |  | |
| 101 RAL 1023 | 102 PAN 159C | 103 PAN 153 | 104 PAN 149 | 105 PAN 155 | 106 RAL 9001 | 107 PAN 9185 | 108 RAL 7044 | 109 PAN 4725 | |
|  |  |  |  |  |  |  |  | | |
| 201 PAN 201C | 202 PAN 242C | 203 RAL 4005 | 204 PAN 5215 | 205 PAN 1895 | 206 PAN 9023C | 207 PAN 9022 | 208 RAL 9003 | | |
|  |  |  |  |  |  |  |  | | |
| 301 PAN 9062C | 302 RAL 9010 | 303 PAN 9143 | 304 RAL 9002 | 305 PAN 9081 | 306 PAN 420 | 307 RAL 7046 | 308 RAL 7031 | | |
|  |  |  |  |  |  |  |  |  |  |
| 401 PAN 7468C | 402 PAN 651C | 403 PAN 2905 | 404 PAN 549 | 405 PAN 2915 | 406 PAN 290 | 407 PAN 9044C | 408 RAL 6019 | 409 PAN 5783C | 410 PAN 7492C |
|  |  |  | | | | | | | |
| 411 RAL 6033 | 412 PAN 7474 | 413 PAN 561 | | | | | | | |

** The designer colors are available in all thicknesses and dimensions stated above. They are subject to a minimum quantity.

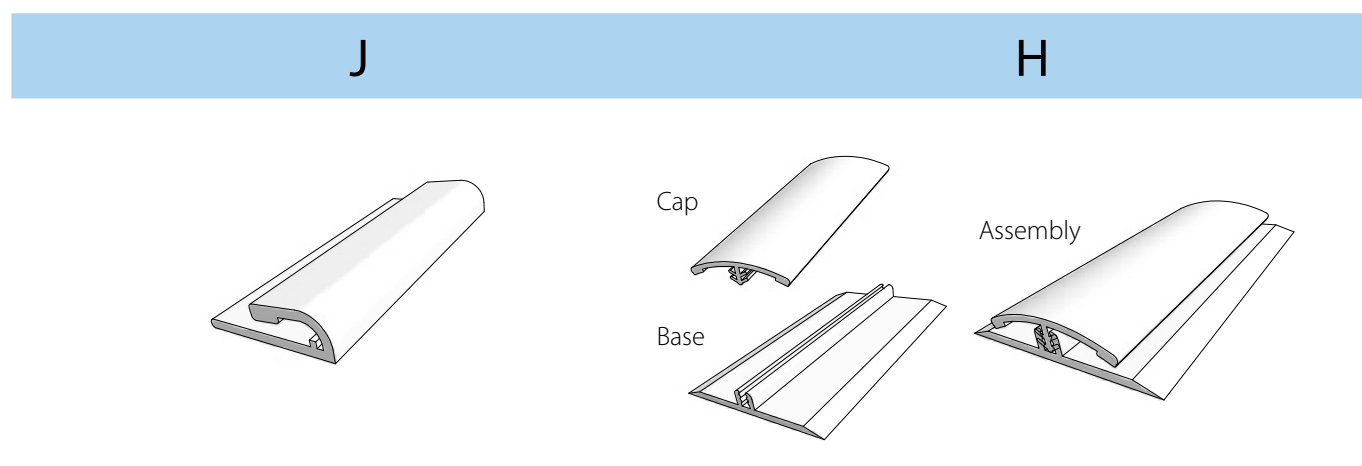
** The designer colors are available in all thicknesses and dimensions stated above. They are subject to a minimum quantity.

Standard PALOPAQUE™ Dimensions

| Width x Length (mm) | Thickness (mm) |
|---------------------|----------------|
| 1220 x 2440 | 1 to 15 |
| 1000 x 2000 | 1 to 10 |
| 1500 x 3000 | 1 to 6 |

* Custom dimensions are available, subject to minimum quantity.

HYG Profile System for Cladding



Resistance to Chemicals

Excellent resistance to... mineral acids, alkalis, plating solutions, paper making chemicals, pickling solutions, other inorganic solutions and fumes thereof.

Good resistance to... alcohols, aliphatic hydrocarbons, glycols, amines, phenols.

Not recommended for contact with... ketones, chlorinated solvents, aromatic hydrocarbons, some esters and ethers.

For more information please refer to "Chemical Resistance of PVC Products" available at www.palram.com (Download section>General Information) or to your PALRAM distributor.

Flammability

HYG sheets are self-extinguishing and comply with the most demanding international fire resistance standards defined in the field of plastics, as indicated by representative results in the attached table.

| Standard | Classification |
|-------------|----------------|
| EN 13501 | B, s3, d0 |
| DIN 4102 | B-1 |
| BS 476/7 | Class 1 |
| NSP 92501,5 | M-1 |
| ASTM E 84 | Class A |

Lab Test Microbe Elimination on Sample Sheets

Note on Tests Described in This Brochure

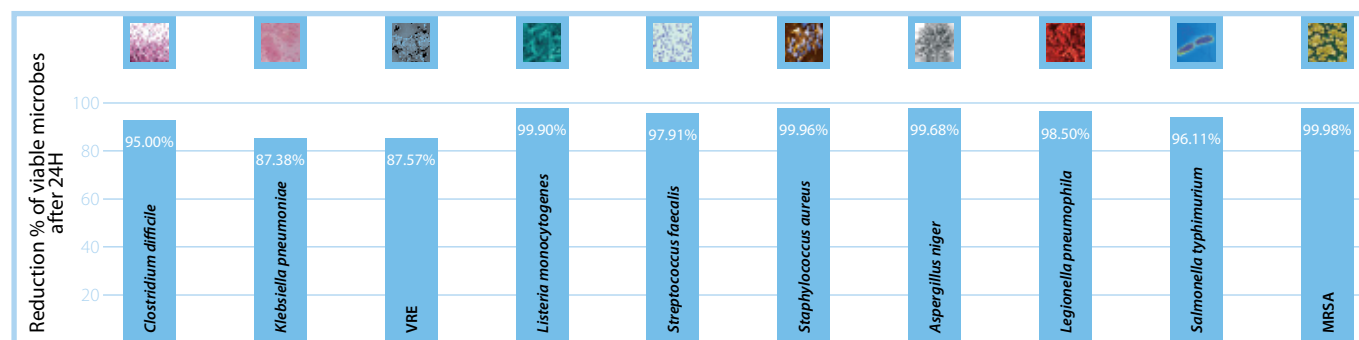
PALRAM's research uncovered no published standardized method to measure the growth of microbes on a plastic surface intended for use as cladding or roofing. The method described below was specifically designed for this task. It is based on existing methods developed to test the resistance of polymeric materials to fungi, algae, and bacteria (ASTM G-21, ASTM G22-76, ASTM G29-96, JIS-Z2801). The following tests were performed at independent, recognized microbiology laboratories in Israel (Milouda), Germany (Ciba) and England (IMSL).

Description of Test

JIS-Z2801 standard was selected as test procedure (see right page for schematic representation). Prior to testing, all the tested samples (4 samples of each material tested) were cut to 50x50mm pieces and soaked for 1 minute in 70% ethanol, which was then dried in an oven at 45°C for 4 hours. The samples of the tested materials were inoculated with 0.1ml of microorganism culture and covered with a film/glass cover to prevent evaporation. The samples were then incubated at 29°C to 37°C according to the microbe's preferred growing conditions

and >90% RH for 24hrs. Viable organisms were recovered by steeping the tested sample in a phosphate buffer, and then serially diluting the fluid. Four separate identical samples of 0.1ml of each concentration were then dispersed on Petri dishes containing Nutrient Agar matched to the type of bacteria, then incubated for 24/48 hours at 29°C to 37°C. colonies then counted and the concentration was calculated, the result reported is the average. A control (no antimicrobial additive) was run for each microorganism tested (included are some of the different strains of bacteria and Fungi tested).

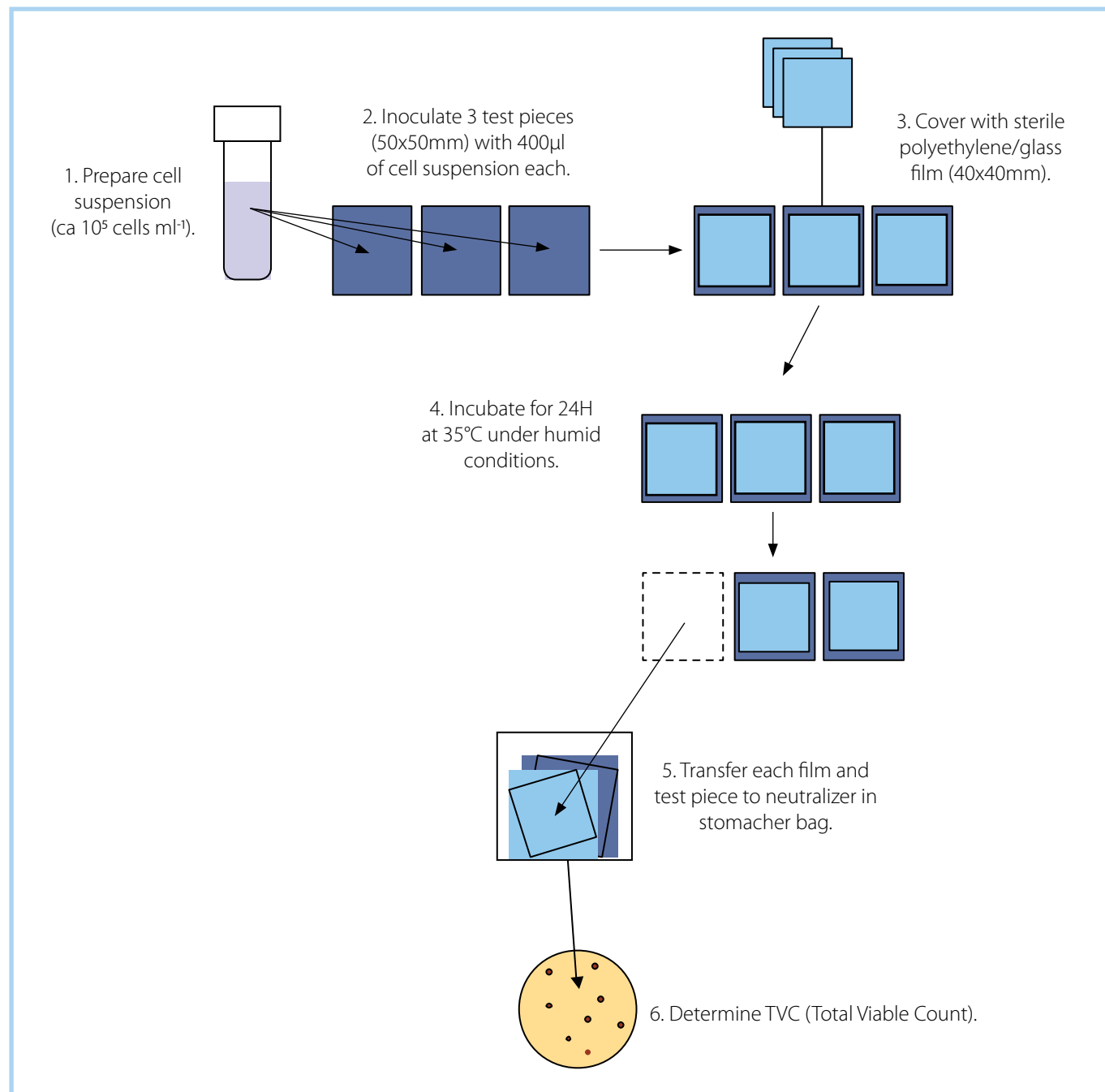
Test Results (CFU Reduction after 24H)



Conclusions

The results show that PALOPAQUE HYG panels demonstrate high antimicrobial activity. Use of HYG Products, along with an adequate cleaning regime, would significantly reduce microbial and dangerous pathogens growth.

Schematic Representation of JIS Z 2801:2000



Field Test Microbe Comparison of Cladding in Operating Theatres

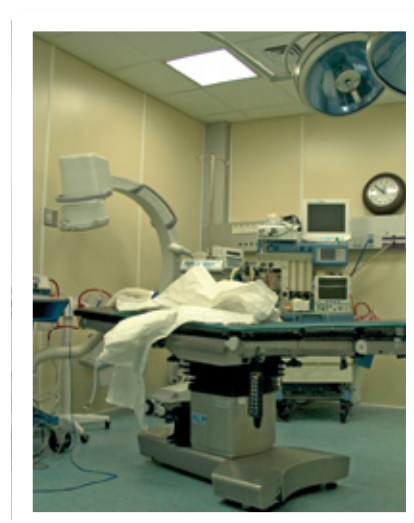
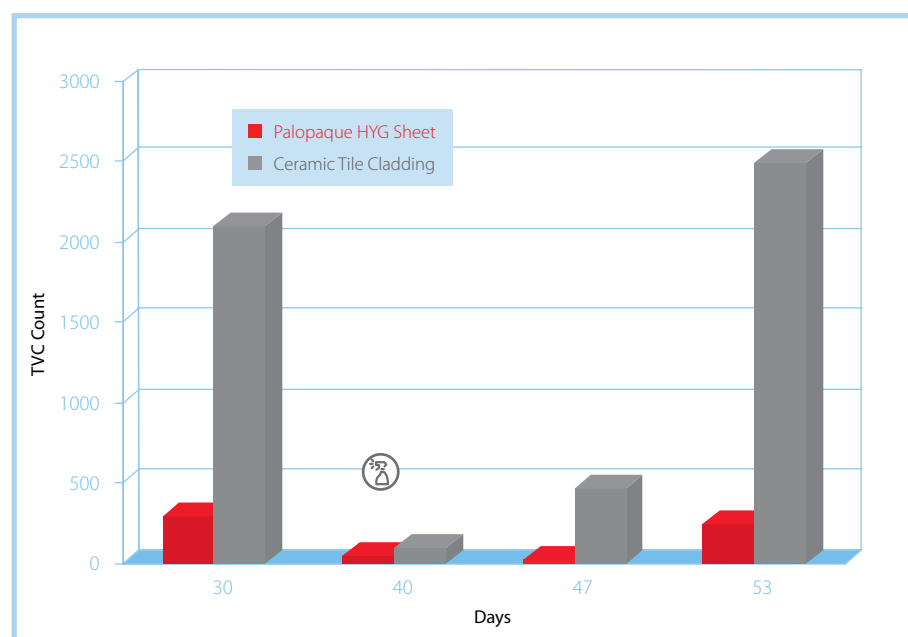
Test Background

PALOPAQUE HYG flat sheets were installed as cladding in the operating theatre of a private hospital. The test was conducted to compare microbe elimination of the cladding in the operating theatre to that of a different operating theatre with standard ceramic tiles in the same hospital. Both rooms were maintained regularly and cleaned with chemical agents in a similar manner. The growth on both wall surfaces was sampled simultaneously on a varying basis and then sent to a biological laboratory for testing.

Method of Testing

After installation, an area of 1x1m was cleaned thoroughly with ethanol 70%. The same area was wiped with a sterile sponge at every sampling. The sponge was then dipped in liquid buffer to recover the microorganisms. 0.1ml of that liquid were then cultivated on petri dishes containing nutrient agar, for 24 hours at 37°C for a total count of microorganisms, a separate test was done for fungi growth at 29°C. The samples were collected every week for approx. a month and then again after 2 months, the tests were done by an independent microbial laboratory. Results report follows.

Results



Marks the day when both rooms were cleaned

Conclusion

PALOPAQUE HYG cladding maintained a constant low level of living microorganisms on the surface, demonstrating high antimicrobial activity. High counts of microorganisms on the ceramic tiles are interrupted only by periodic cleaning.

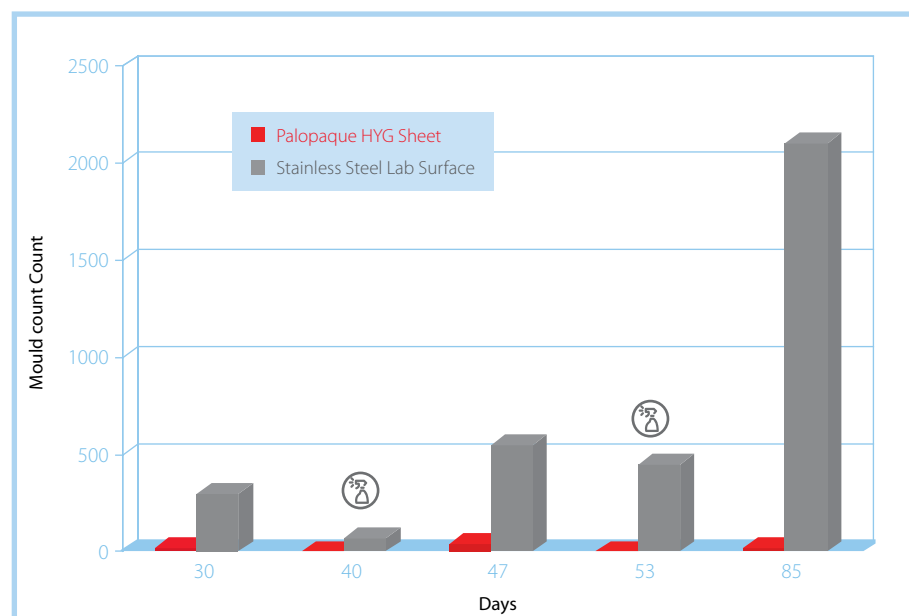
Field Test Work Surface Comparison in microbial laboratory

Description of Test

PALOPAQUE HYG was placed as a surface cover for a table at a work station in a microbial laboratory. The HYG covered table was then compared to a stainless steel work surface within the same room.

Both surfaces were wiped periodically by a sterile sponge. The sponge was then dipped in phosphate buffer, 0.1ml of which was then dispersed on a petri dish with nutrient agar. The Petri dish was incubated for 48 hours at 37°C 90% RT for a total count of microorganisms. The same procedure was used for a check of fungi growth, in which case the growing temperature was 29°C. The surfaces were checked periodically during the course of approx. 2 months.

Results



Marks the day when both rooms were cleaned

Conclusion



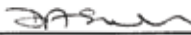
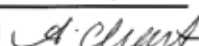
PALOPAQUE HYG surface cover maintained an extremely low level of living microorganisms on the surface, demonstrating high antifungal activity. High counts of microorganisms on the stainless steel surface are interrupted by cleaning.



PALOPAQUE HYG (white) plated work surface in a microbial laboratory.

Certification

Contact with Foodstuffs

| | | | |
|--|---------------------------------|--|---|
|  | | <i>test report</i> | |
| | | Pira International Cleeve Road, Leatherhead, Surrey KT22 7RU, United Kingdom Telephone: +44 (0)1372 802000 Fax: +44 (0)1372 802238 www.piranet.com | |
| | | Test laboratory number | |
| | | Reference number | 05A12J1523 |
| | | Page | Page 1 of 3 |
| Palram Europe Ltd Unit 2 Doncaster Carr Industrial Estate White Rose Way Co. Durham, DL5 6DB | | This report is made subject to the conditions that it is confidential and may not be disclosed in whole or part to others without written consent Order no: 0670 Attention: Mike Heaven | |
|  | Test material: | 1 sample of white solid PVC sheet, trade names: 'PALOPAQUE' 'PALCLAD' | |
| | Sampled and supplied by: | Palram DPL Ltd | |
| | Samples received: | 27 May 2005 | |
| | Date(s) of testing: | 27 May to 28 June 2005 | |
| | Date of reprint: | 15 December 2009 | |
| | Test(s) required: | Overall migration by total immersion into simulants B, C and D; exposure conditions 10 days at 40°C. Overall migration simulants and conditions as defined in EC Directive 97/48/EC. Simulant B - 3% w/v acetic acid Simulant C - 10% v/v ethanol Simulant D - rectified olive oil | |
| <i>remarks</i> | | Catherine Smith | Tested  |
| | | Allison Chambers | Date 15/12/09 |
| | | | Checked  |



test report

Pira International
Cleeve Road, Leatherhead, Surrey KT22 7RU, United Kingdom
Telephone: +44 (0)1372 802000
Fax: +44 (0)1372 802238
www.piranet.com

Test laboratory number

Reference number: 05A12J1523

Page Page 2 of 3

Palram Europe Ltd
Unit 2 Doncaster Carr Industrial Estate
White Rose Way
Co. Durham, DL5 6DB

This report is made subject to the conditions that it is confidential and may not be disclosed in whole or part to others without written consent

Order no: 0670
Attention: Mike Heaven

Method(s):

Overall migration into aqueous simulants (B and C)
After exposure to the simulant under conditions specified, test specimens were removed from contact; the aqueous extract was transferred to a weighed container and evaporated to dryness and constant weight.

EN 1186 - 3 - total immersion

Overall migration into olive oil (simulant D)
After exposure to the simulant under conditions specified, test specimens were removed from contact; excess oil blotted off, and re-weighed. Absorbed oil was determined by extraction and GC quantification.

EN 1186-2 - total immersion

Test results:

The overall migration is expressed as the amount in milligrams of material lost from one decimetre square surface (mg/dm^2). As the total immersion method was used and the samples were more than 0.5 mm thick, results were calculated taking into account the area of both surfaces of the test specimens i.e. for a 1 dm^2 test specimen the surface area used for the calculation was 2 dm^2 .

remarks

Catherine Smith

Allison Chambers

Tested ASW

Date 15/12/09

Checked A. Clift



test report

Pira International
Cleeve Road, Leatherhead, Surrey KT22 7RU, United Kingdom
Telephone: +44 (0)1372 802000
Fax: +44 (0)1372 802238
www.piranet.com

Test laboratory number

Reference number: **05A12J1523**

Page **Page 3 of 3**

Palram Europe Ltd
Unit 2 Doncaster Carr Industrial Estate
White Rose Way
Co. Durham, DL5 6DB

This report is made subject to the conditions that it is confidential and may not be disclosed in whole or part to others without written consent

Order no: 0670
Attention: Mike Heaven

Sample: **"PALOPAQUE" / "PALCLAD"**
Test conditions: **10 days at 40°C**

| Method Replicates | EN 1186-3 Migration into 3% w/v acetic acid (Simulant B) mg/dm ² | EN 1186-3 Migration into 10% v/v ethanol (Simulant C) mg/dm ² | EN 1186-2 Migration into olive oil (Simulant D) mg/dm ² |
|----------------------|---|--|--|
| 1 | 0.6 | 0.1 | 1.9 |
| 2 | 0.3 | 0.6 | 2.2 |
| 3 | 0.5 | 0.3 | 1.4 |
| 4 | - | - | 1.7 |
| Mean result | 0.5 | 0.3 | 1.8 |
| Limit | 10.0 | 10.0 | 10.0 |

Samples will be retained for 3 months after the completion of testing and will then be disposed of, unless the client requests otherwise.

remarks

Catherine Smith

Allison Chambers

Tested *[Signature]*

Date 15/12/09

Checked *[Signature]*

PALOPAQUE™ Flammability



Dossier H015351 - Document CEMATE/1 - Page 1/5

PROCES-VERBAL DE CLASSEMENT DE REACTION AU FEU D'UN MATERIAU

prévu à l'article 5 de l'arrêté du 21 novembre 2002

VALABLE 5 ANS à compter du 19 janvier 2007

N° H015351 - CEMATE/1

et annexe de 4 pages

Matériau présenté par :

PALRAM EUROPE LTD
Unit 2
Doncaster Carr. Industrial Estate
White Rose Way
DONCASTER DN4 5JH
UK

Marque commerciale :

PALOPAQUE

Description sommaire :

Composition globale : Panneau de PVC opaque.

Application :

Communication, sérigraphie, présentoirs, thermoformage,
industrie, bâtiment.

Masse :

(5600 ± 5 %) g/m²

Epaisseur :

(4 ± 5 %) mm

Coloris :

blanc

Rapport d'essais :

N° H015351 - CEMATE/1 du 19 janvier 2007

Nature des essais : Essai(s) par rayonnement.

Classement :

M1

Durabilité du classement (annexe 22) :

NON LIMITEE A PRIORI

compte tenu des critères résultant des essais décrits dans le rapport d'essai N° H015351 - CEMATE/1 annexé.

Ce procès verbal atteste uniquement des caractéristiques de l'échantillon soumis aux essais et ne préjuge pas des caractéristiques de produits similaires.

Il ne constitue pas une certification de produits au sens de l'article L. 115-27 du code de la consommation et de la loi du 3 juin 1994.

Est seule autorisée la reproduction intégrale soit du présent Procès-verbal de classement qui comprend 1 page soit l'intégralité du Procès-Verbal et rapport annexé qui comporte 5 pages.

Trappes, le 19 janvier 2007



Accréditation
N° 1-0606
Portée disponible
Sur www.cofrac.fr

Le Chef de la Division
Comportement au Feu

Alain SAINRAT



La Responsable Technique

Lise GHYZEL

Laboratoire national de métrologie et d'essais

Etablissement public à caractère industriel et commercial • Siège social : 1, rue Gaston Boissier 75734 Paris Cedex 13 • Tél. : 01 40 43 37 00
Fax : 01 40 43 37 37 • E-mail : info@lne.fr • Internet : www.lne.fr • Siret : 313 320 244 00012 • NAF : 743 B • TVA : FR 92 313 320 244
Banque Paris Centrale IBAN : FR76 3058 8600 0149 7267 4010 170 BIC : BARCFRPP

PSDS - Product Safety Data Sheet

Rigid PVC Sheet

Date of issue: April 2004

Updated: February 2008

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 : PALRUF®, PALCLEAR™, PALOPAQUE™, PALDOOR™, Palclad™, AG-TUF™, WallITUF™, HYG (Hygienic) Products
 Product Name : Rigid Polyvinyl Chloride sheets
 Material Name : Polyvinyl Chloride Homopolymer
 CAS Number : 9002-86-2
 UN Number : None
 ACX Number : X1007407-8
 RTECS : KV0350000
 Material Synonyms: PVC
 NFPA Ratings : Health=1, Fire=0, Reactivity=0

1.2. Company Identification & Contact

| Israel - PALRAM PVC | UK - PALRAM DPL | Americas - PALRAM PANELS (PPI) |
|---|--|--|
| Address: Ramat Yohanan, 30035, ISRAEL Tel: +972 4 8459 900 Fax: +972 4 8444 012 | Address: 22 Coatham Ave. Aycliffe Industrial Park Newton Aycliffe Co. Durham, DL5 6DB, UK Tel: +44 1325 300437 Fax: +44 1325 318173 | Address: 9471 Commerce Circle Kutztown, PA 19530, USA Tel: +610-285-9918 Fax: +484-647-8210 |

Local: Call your nearest poison control center

2. Composition / Information of Ingredients

Tin stabilized PVC sheets, 2.5% by weight tin-maleate or tin-mercaptide based stabilizer.

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

No solvents. No plasticizers. No cadmium, lead, or other heavy metals used.

3. Hazards Identification

No particular hazards known.

3.1. Health Hazard Data

3.1.1 Effects of a Single Overexposure

Swallowing : non-relevant
 Skin absorption : non-relevant
 Inhalation : non-relevant
 Skin contact : exposure is not expected to cause adverse health effects
 Eye contact : non-relevant

3.1.2 Effects of a Repeated Overexposure - None currently known

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 combustion fumes in high concentration - bring victim to fresh air. Medical attention needed.

4.2. Ingestion

Route of entry – ingestion: No

4.3. Skin Contact

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

Do not remove the polymer from the skin. Medical attention needed.

4.4. Skin Absorption

Route of entry – skin: No

4.5. Eye Contact

Like any foreign body, can cause mechanical irritation. Consult physician.

4.6. Notes for Physician

There are no specific notes.

5. Fire Fighting Measures

5.1. Extinguishing Media

Water spray or 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

Personnel without suitable respiratory apparatus should leave the affected area to prevent exposure to toxic or combustible gases.

5.4. Special Protective Equipment for Firefighters

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

5.5. Unusual Fire and Explosion Hazards

PVC is a self extinguishing fire retardant material, that being exposed to open fire and high temperatures decomposes emitting large quantities of HCl, which tends to extinguish the flames. It does not continue to burn after ignition without an external fire source. HCl has a strong acidic odor that causes sensory alert at very low concentrations. HCl odor threshold = 0.77 ppm. Exposure to high concentrations of HCl will cause irritation of the respiratory passages, at very high concentrations may cause burns to mucous membranes. OSHA legal airborne PEL is 5 ppm, not to be exceeded at any time. ACGIH recommended airborne exposure limit is 5 ppm, which should not be exceeded at any time. Soot emitted when PVC is forced to burn may obscure visibility.

6. Accidental Release Measures

No special precautions and no personal protective equipment needed. Collect mechanically for disposal.

7. Handling and Storage

7.1. Handling

General handling precautions

Avoid mechanical contact with eyes.

Ventilation

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

Other precautions

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

Static electricity discharge sparks possible during handling. Avoid contact or vicinity of flammable materials.

When opening truck or railcar for unloading, ventilate before entering.

7.2. Storage

Store in a cool shady area. No special technical protective measures required.

8. Exposure Controls / Personal Protection

8.1. Exposure Limits

No occupational exposure limits established by OSHA, ACGIH, or NIOSH.

8.2. Personal Protection

| | |
|-----------------------------------|--------------------------------|
| Respiratory protection | : No special protection needed |
| Hand protection/protection gloves | : No special protection needed |
| Eye protection | : No special protection needed |
| Other protective equipment | : No special protection needed |

9. Physical Properties

| | |
|-----------------------|-------------------------------------|
| Appearance | : Flat or corrugated plastic sheets |
| Physical State | : Solid |
| Color | : Clear or colored |
| Odor | : None |
| Density | : 1.35-1.45 gr/cm ³ |
| Heat Deflection | : 62-65°C |
| Boiling Point, 760 Hg | : Not relevant |
| Viscosity | : Not relevant |
| Solubility in Water | : <0.1g/100mL at 23°C |
| pH Value | : Not relevant |
| Flash Point | : 391°C ASTM D 1929 |
| Autoignition Temp. | : 454°C 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

Excessive heat, or open flame. Temperature above 150°C will decompose raw polymer resin and liberate HCl.

Incompatible materials

Oxidizing agents or strong mineral acids can cause reaction.

Thermal decomposition

Begins above 150°C caused by fire, overheating during improper processing. Fumes damaging to health may be released.

Hazardous decomposition products

Burning can produce the following combustion products:

Carbon monoxide (CO) - is highly toxic if inhaled;

Carbon dioxide (CO₂) - in sufficient concentrations can act as an asphyxiant;

Hydrogen chloride (HCl) - in high concentrations cause irritation of the respiratory passages, at very high concentrations may cause burns to mucous membranes.

10.2. Reactivity

Hazardous polymerization : Will not occur

Hazardous reactions : None

11. Toxicological Information

PVC materials have a very low acute toxicity. In rats an acute LD50 > 10 gr/kg of body weight. PNEUMOCONIOSIS has been described from inhalation of combustion products (effects of overexposure).

Industrial hygiene studies have shown that under normal and expected conditions of use of PVC materials, exposures are well below applicable limits.

11.1. Acute Toxicological Information

| | |
|-----------------------------|----------------------------|
| Acute oral toxicity | : None |
| Acute percutaneous toxicity | : None |
| Acute vapor exposure | : None |
| Primary skin irritation | : No irritation |
| Eye irritation | : No irritation |
| Sensitization | : No information available |
| Chronic effects | : Unknown |
| Carcinogenicity - NTP | : Not listed |
| - IARC | : Not listed |
| - OSHA | : Not listed |

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 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 Risks

No hazard expectation to terrestrial or aquatic flora and fauna.

| | |
|------------------|--|
| Ecotoxicity | : LD50 (rats) > 10 gr/kg |
| | : IC50 (bacterial inhibition) - no data available |
| Aquatic toxicity | : LC50 (daphnia magna) - no data available |
| | : LC50 (fathead minnow – fish) - no data available |

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 safety 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.

High temperature incineration under controlled conditions due to formation of HCl.

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

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

OSHA Hazard Communication Classification for dusts and combustion fumes: Irritant, Skin Hazard, and Lung Hazard.

SARA Title III Classification for dusts and combustion fumes: Acute Health Hazard; Chronic Health Hazard.

WHMIS Classification: Non-hazardous

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.

Since the conditions and methods of use of its products are beyond PALRAM's control, PALRAM expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information and each user is responsible for making its own determination as to the safe and proper handling of this material in its own particular use of this material.

Modification of this PSDS, unless specifically authorized by PALRAM, is strictly prohibited.

No warranty of fitness for any particular purpose, warranty of merchantability, or any other warranty, expressed or implied, is made concerning the information provided herein.

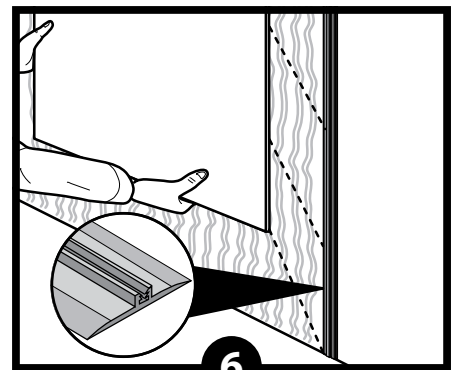
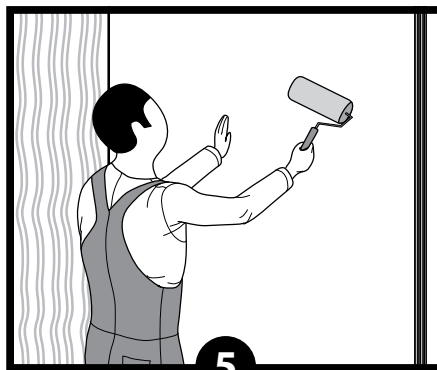
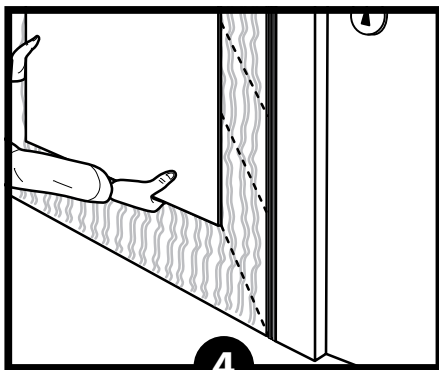
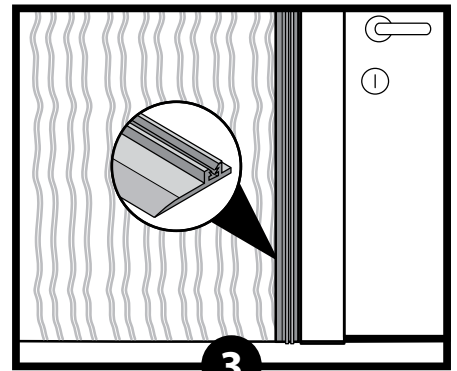
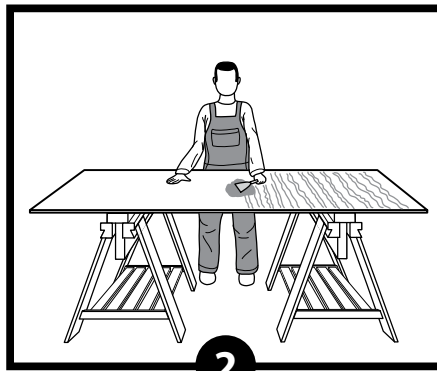
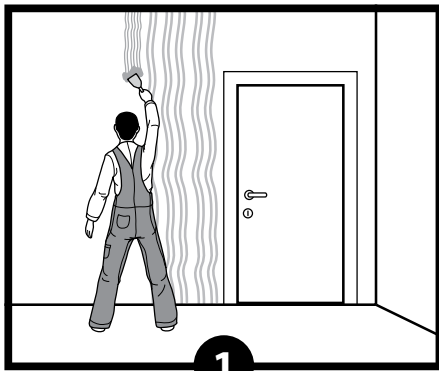
Installation Using Profiles

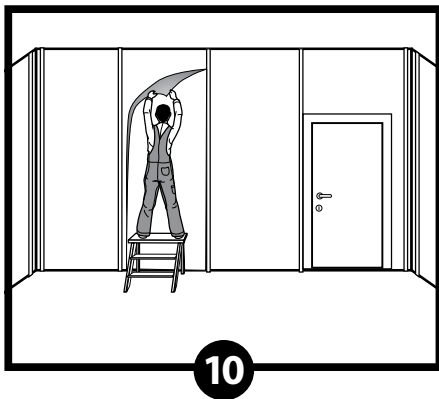
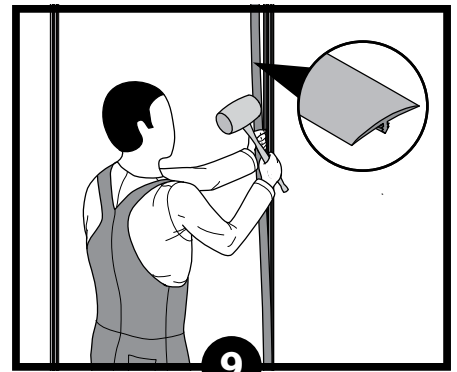
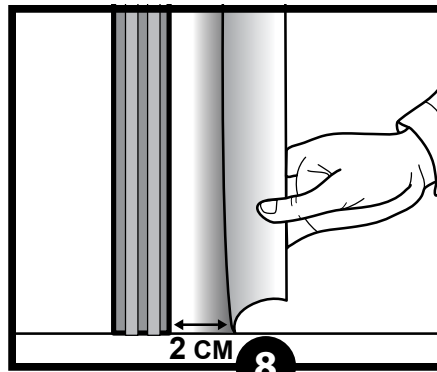
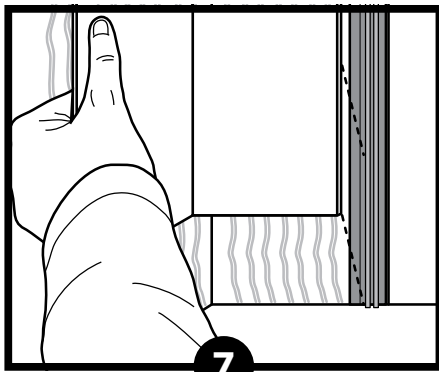
Preparation

- Sterile/clean rooms
- Walls should be reasonably level and flat, remove high spots and fill dents.
- All surfaces must be clean and dry.
- Prepare the panels and profiles in suitable dimensions for the intended surface.

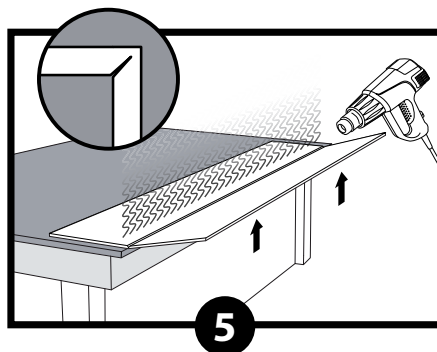
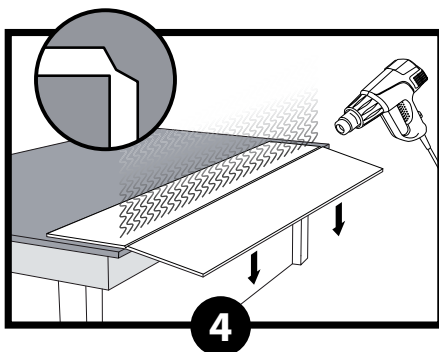
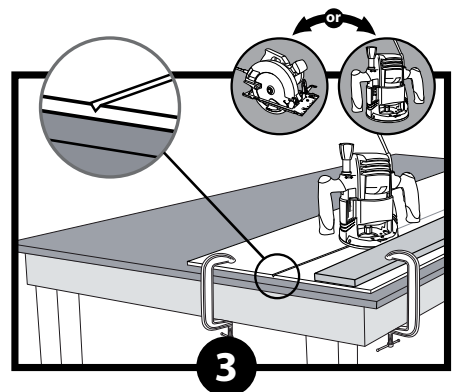
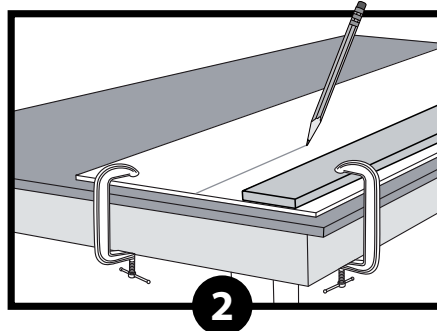
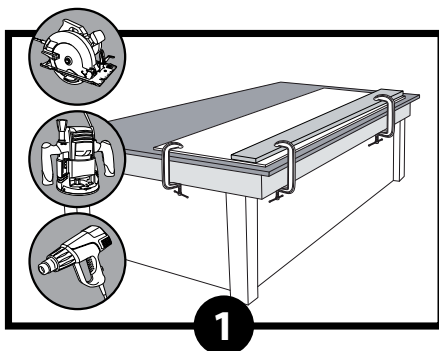
Panel Installation (See Illustrations Below)

| Illustration Number | Guidelines |
|---------------------|--|
| 1+2 | Apply the glue on the wall, HYG panels and J section bases. When using PALRAM glue please note that its color should turn from white to clear, usually within 20 - 30 minutes. |
| 3 | Position and attach the first J section base to the wall. |
| 4 | Attach the first HYG panel to the wall and profile. |
| 5 | Apply pressure to the surface of the Panel in order to ensure good adhesion and removal of any trapped air. |
| 4+5+6 | Position the H section base and repeat steps 3, 4, 5. |
| 7 | Internal and external corners should include prepared grooves. See next page for grooving and bending guidelines. |
| 8 | When all sheets are in place, peel off the edges of the protective film approx. 2 cm from edge. |
| 9 | Attach the profile caps onto the bases using a rubber mallet. |
| 10 | Peel off the protective films after all other jobs on site are finished. |

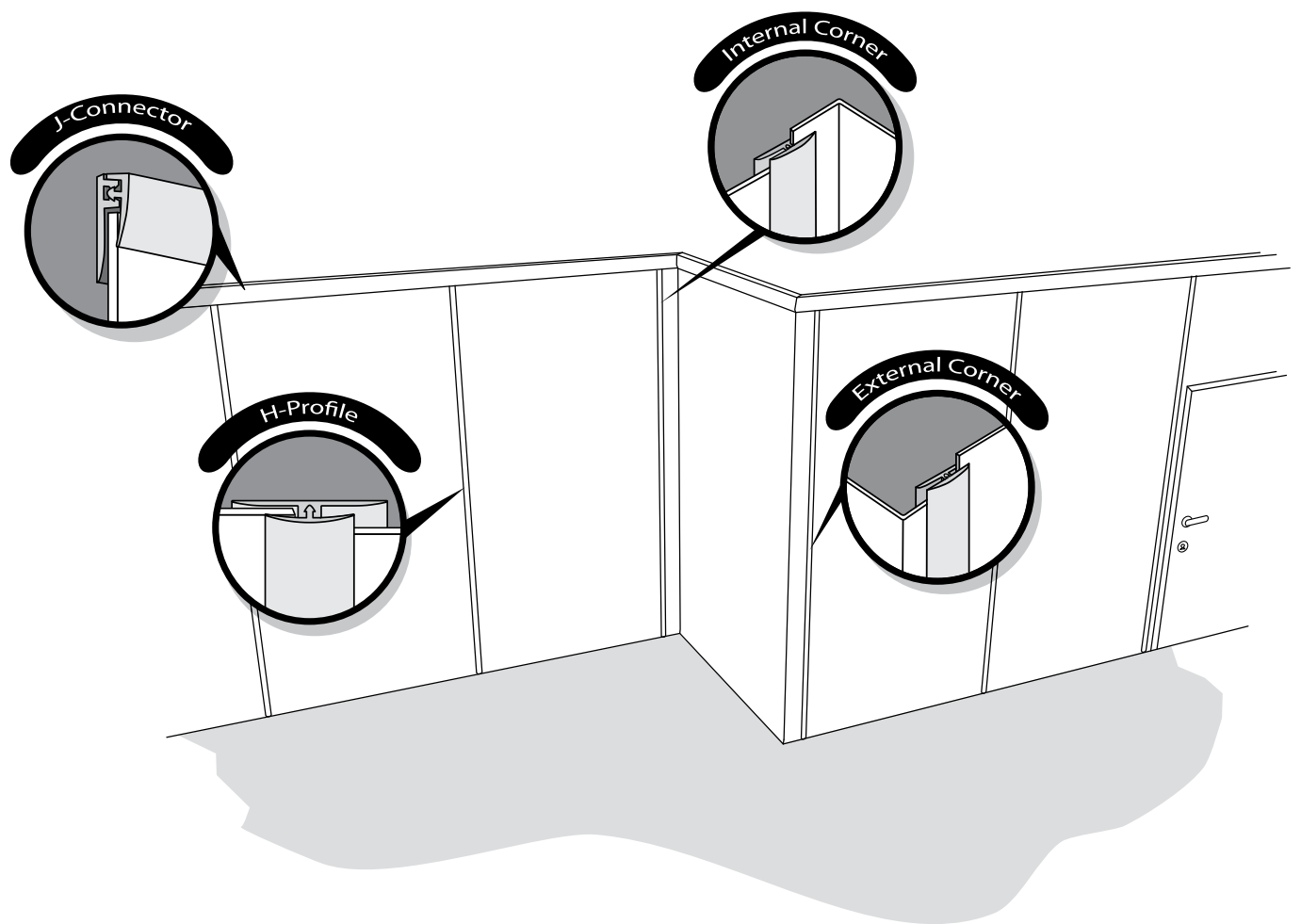




Grooving and Bending Guidelines



Complete Wall Installation



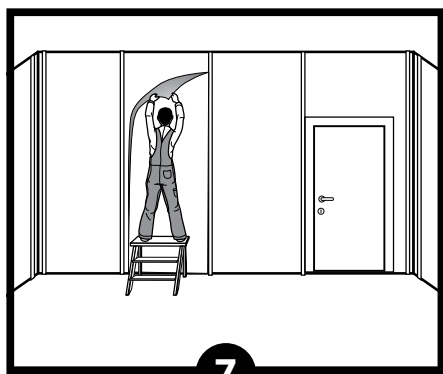
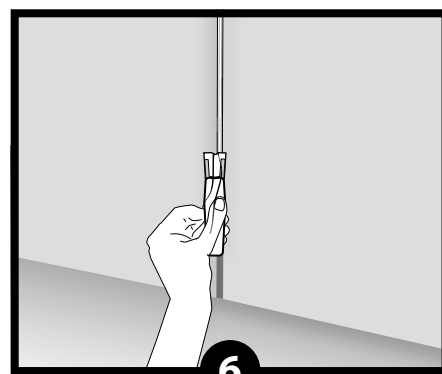
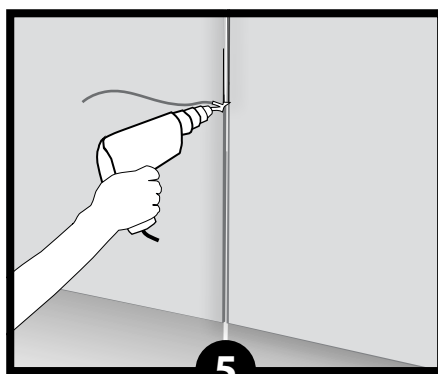
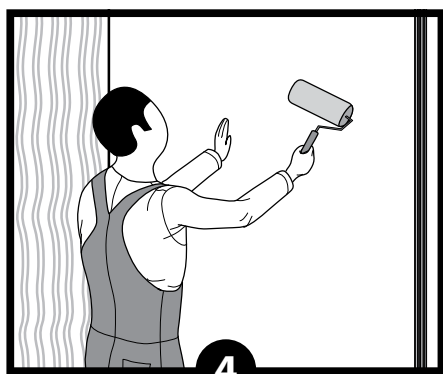
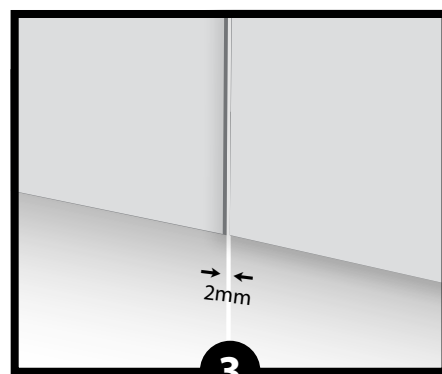
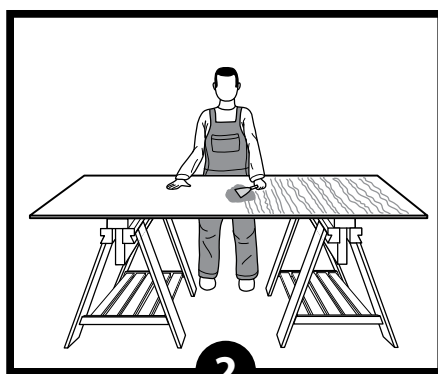
Installation Using Welding Rods

Preparation

- Sterile/clean rooms
- Walls should be reasonably level and flat, remove high spots and fill dents.
- All surfaces must be clean and dry.
- Prepare the panels in suitable dimensions for the intended surface.

Panel Installation (See Illustrations Below)

| Illustration Number | Guidelines |
|---------------------|---|
| 1+2 | Apply the glue on the wall and panels. When using PALRAM glue please note that its color should turn from white to clear, usually within 20 - 30 minutes. |
| 3 | Keep a 2mm gap between the panels. |
| 4 | Apply pressure to the surface of the Panel in order to ensure good adhesion and removal of any trapped air. |
| 5 | Weld the panels using palram welding rod at a temperature of ~140°C |
| 6 | Trim the welding rod using a special knife. |



In as much as PALRAM Industries has no control over the use to which others may put the material, it does not guarantee that the same results as those described herein will be obtained. Each user of the material should make his own tests to determine the material's suitability for his own particular use. Statements concerning possible or suggested uses of the materials described herein are not to be construed as constituting a license under any PALRAM Industries patent covering such use or as recommendations for use of such materials in the infringement of any patent. PALRAM Industries or its distributors cannot be held responsible for any losses incurred through incorrect installation of the material. In accordance with our company policy of continual product development you are advised to check with your local PALRAM Industries supplier to ensure that you have obtained the most up to date information

► Manufacturer's Lifetime Warranty

HYG panels are warranted to keep their HYG activity for up to 25 years.

HYG panels carry a limited lifetime warranty for color stability, not to display a change in delta E of more than 6 units for a period of 5 years from the initial date of purchase and no more than 1 unit per year thereafter (hereinafter "decrease") as a direct and exclusive result of the impact of solar radiation (as percentage measured according to the procedures specified in ASTM D-1925-77).

Note: warranties only apply when installation and maintenance follow PALRAM's installation instructions and guidelines and are subject to PALRAM's limited manufacturer warranty certificate and any of its contained terms.



PALRAM Industries Ltd.

PALRAM Israel Ltd.

Tel ► (972) 4 8459 900
Fax ► (972) 4 8459 980
E-mail ► palram@palram.com
Web ► www.palram.co.il

PALRAM Americas Inc.

Tel ► 610 285 9918
Fax ► 610 285 9928
E-mail ► palramamericas@palram.com
Web ► www.palramamericas.com

PALRAM Europe Ltd.

Tel ► (44) 1302 380776
Fax ► (44) 1302 380788
E-mail ► sales.europe@palram.com
Web ► www.palram.com

