

AGRICULTURAL

plastics

division





ASPLA-PLÁSTICOS ESPAÑOLES, S.A.

Avda. Pablo Garnica, 20
39300 Torrelavega (Cantabria) SPAIN
Tel.: + 34 942 84 61 00
Fax: + 34 942 89 38 31
info@aspla.com
www.aspla.com

REYENVAS, S.A.

Autovía Sevilla-Málaga, Km. 5
Polígono Industrial La Red
41500 Alcalá de Guadaíra (Sevilla) SPAIN
Tel.: +34 95 563 15 40
Fax: +34 95 563 16 39
info@reyenvas.com
www.reyenvas.com

RAFIA INDUSTRIAL, S.A.

La Fábrica, 2 46114 Vinalesa (Valencia) SPAIN
Tel.: + 34 961 49 10 81
Fax: + 34 961 49 39 15
info@rafiaindustrial.com
www.rafiaindustrial.com

SOLPLAST, S.A.

Polígono Industrial de Lorca Apdo. 323
E 30800 Lorca (Murcia) SPAIN
Tel.: +34 968 46 13 11
Fax: +34 968 47 10 54
info@solplast.com
www.solplast.com

SOTRAFA, S.A.

Paraje Cartabona Nº12
04710 Sta. María del Águila, El Ejido (Almería) SPAIN
Tel.: +34 950 40 56 00
Fax: +34 950 58 02 33
info@sotrafa.com
www.sotrafa.com



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Just as sure as seasons are repeated year after year, seeds yield their fruits if they are well cared, and natural products will be essential to the diet and lives of millions of consumers... Likewise it is certain that the Armando Alvarez Group, with the most advanced range of solutions in plastic products for crop protection, will always provide farmers globally the security of catering to their needs and accompanying them throughout the process of obtaining the highest yields from their crops.





SALES OFFICES AND LOGISTIC CENTERS

United Kingdom
France
Germany
Portugal
Benelux
Morocco
Turkey
Mexico

The Armando Alvarez Group (AAG) is a world-leading plastics supplier for both the agricultural and industrial packaging markets.

At present, the Group owns 10 plastic processing factories across Spain. The Group's first companies started their activity in 1964 and quickly, through strategic purchasing, diversified their activity to 15 companies in order to be able to give complementary products and services to their clients. Innovation became the foundation for competitiveness and growth of the AAG.

The AAG accumulates an experience of over 40 years and is currently one of the leading processors of

polythene plastic in Europe with an annual production capacity of over 250.000 tonnes and employing nearly 2.000 workers.

Our investment policy in the acquisition of high-tech industrial machinery besides the long experience of our team as well as the close relationships with our customers, guarantee sustained growth in trade figures as well as global competitiveness.

Approximately 50% of the Group sales are exported to 78 countries in five continents through a network of distributors and local agents as well as our own regional platforms.

Through our local presence, we are able to analyze and attend to any customer's demand thanks to the interaction between all the Armando Álvarez Group company network. Our main target is to offer our clients global solutions and individual services.

R&D is the driving force of our companies' commercial strategy and we focus on creating and developing new products and services.

We share the latest innovations with our customers with the goal of building together the bases for long term relations, both personal and professional.

MAIN PRODUCTS

Rigid packaging: metal drums, jerrycans, polythene drums, printed PE bottles and jars,

Flexible packaging: FFS printed Tubing, pallet stretch film, printed shrink hoods or tubing, complex films in PE-OPP-OPA-PET and laminating films, raffia sacks,.....

Agricultural plastics: greenhouse film, mulching films, silage and crop packaging (silage bags, bale wrap, bunker silos, baler twine, .),

Engineering plastics: geomembranes for various applications such as drinking or irrigation water reservoirs, landfills and industrial refuse sites, reservoirs for evaporation, tunnels and roads, etc.



Agricultural Plastics Division

The Armando Alvarez Group specialises in manufacturing a wide range of films for agriculture, meeting farmers requirements in their specific growing environments.

The Agri-plastics division of the AAG is committed to supporting sustainable agriculture and farming with future generations in mind by raising crops productivity through innovative research and technology as well as being respectful with natural resources and the environment.

The goal to achieve a more sustainable use of plastics implies developing eco-friendly products and new generation resins. This commitment revolves around **our customers who are our partners in creating value** and we remind our

selves that they participate in our success. Many products have been developed under specific quality certifications such as ISO 9001 and ISO 14000.

Our films are made with the latest technology available in co-extrusion production systems, ranging from 0.5 m up to 19.5 m in width and from 0.012 mm to 2.5 mm in thickness.

By having the most stringent quality control systems in place, we can guarantee the high quality of our products. Constant in-house monitoring is enhanced, as well as on field traceability. As a global Company, we are well renowned as a truly logistics orientated organization providing just-in-time delivery service, directly to main sea ports, clients' warehouses or even to farms.

Our main products are plastic sheets for greenhouse covering, mulching, macro/micro perforated films, small tunnels, silage films, hydroponics, water reservoirs, container liner films and geomembranes.

These products are available in 5 layers which give the product better mechanical properties and durability.

Besides these products, we have developed special films which enhance properties such as thermicity, anti-virus, anti-fog, anti-blackening, light transmission and light diffusion.

Our products are **an active ingredient of the crop**, since their use offers many agronomical advantages to traditional farming.

Greenhouse and Tunnel films (1)



All films are manufactured in mixes of LDPE, LLDPE and EVA materials, being available in standard translucent white or yellow coloured, in widths of up to 19.5 mts (depending on thicknesses).



STANDARD FILMS

Long life films: designed specifically for resistance to solar degradation with optimum light transmission and diffusion that ensures photosynthesis efficiency by improving light dispersion and uniform light distribution inside greenhouses/tunnels.

Thermic Films: formulated to improve heat retention of long infra red radiation inside the greenhouse/tunnel. This permits to achieve good growth rates, to maintain higher foliage temperatures, to prevent the risk of scorching and frost damage as well as to reduce costs on night heating.

EVA Structures: these films have remarkable versatility due to their high flexibility and adaptation to extreme climates, as well as combinations with special features such as anti-dust, anti-drip and anti-virus properties. Their outstanding thermic features promote good growth rates, maintain higher foliage temperatures, prevent the risk of scorching and frost damage as well as reducing costs on overnight heating.

SPECIAL FILMS

Anti-Thermic films: the multilayer structure is specially coextruded to permit a better control of day-night temperatures and achieve optimum insulation of the greenhouse.

Enhanced Light Difusion Option: for shading purposes (for example nurseries) or total blackout in case of special crops (for example mushrooms).

Enhanced Light Transmission Option: higher light transmission (92-93%) that guarantees plant growth is not distorted during winter and crop precocity is obtained.

Anti-Drip Option: prevents dripping on plants thus reducing the incidence of diseases.

Anti-Virus Option: promotes the control of certain diseases by reducing the sporulation of most relevant pathogenic fungi (for example botrytis and mildew) as well as the reduction of certain vectors of those diseases (for example thrips, white fly).

Anti-Blackening Option: designed for red rose growers to achieve the control of blackening of the petals.

Anti-Dust Option: permits to reduce the fixation of dust on the films and maintain high levels of light transmission.

Fluorescent films: convert UV radiation to red and blue wavelengths that enhance photosynthesis permitting sustained growth that results in crop precocity and higher yields.

Laminated raffia: used on the sides, windows, gutters or roof covers. Specially resistant, designed for extreme conditions, reduces tearing.





Greenhouse
and Tunnel films (II)



TECHNICAL PRODUCTS

Hydroponic films: in thicknesses from 100µ onwards, are used as a substrate support for hydroponic crops. Perforations are available upon demand.

Raffia Tying Twine: fibrillated raffia twine, smooth and UV resistant. It offers a guide for the plant development and permits correct maintenance during production.

Special Covers for Vineyards : these protective covers present a very high general light transmission, a better light diffusion (which allows the grapevine stock to be better illuminated, increasing its chemical activity and promoting the precocity and production of fruit) and a good screening of ultraviolet light.

Revlam AGRO and Revlam GUTTER: durable solutions for your greenhouse. All films are manufactured in HDPE materials. Revlam AGRO is an ideal translucent film to preserve the condition of the greenhouse structure over many years, due to its excellent resistance to chemical products and ageing. Applications: zenith windows, side bands, anterooms, etc. Revlam GUTTER is a translucent film, perfect for diverting

away rain water, and has been especially developed for spanish greenhouses. This material has a life span of 8 to 10 years, thanks to the inclusion of ultraviolet stabilizers.

Double chamber: the unexpected fall of temperature causes physiological disruptions to plants. Using this kind of film, we are preventing any extreme change in temperature, without the plant suffering.





Mulch and Microtunnel films (1)

All mulch and microtunnel films are available with micro/macro perforations to enable insect pollination, easy planting and excellent air ventilation throughout the microtunnel or greenhouse (if used as double chambers).



STANDARD FILMS

Transparent Film: for use as mulch, these films are available in a wide range of thicknesses depending on their intended application.

These films increase soil temperature during the day favouring root development and protecting the crop at night allowing calorific radiation to pass from the soil to the atmosphere thus reducing the cooling of the aerial part of the plant.



This combination of factors allows constant growth and crop precocity.

Black Opaque Film: these films are available in various thicknesses. A 0% light transmission is guaranteed.

Microtunnel Film: this film is available in various thicknesses depending on its intended applications. Its EVA base and anti-drip additives noticeably improve the passage of light, especially in the first hours of daylight thus considerably increasing soil temperature as well as preventing heat loss during the night.

SPECIAL FILMS

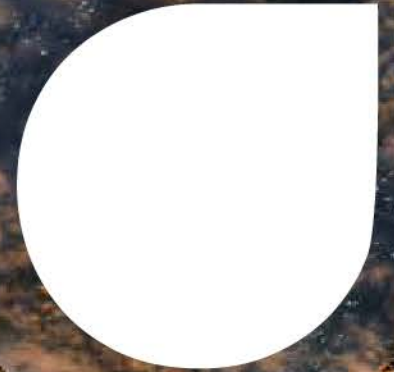
A variety of mono and bicoloured mulch films are available upon demand.

Depending on types of crops and growth environment, different types of films can be used to achieve insect and disease control (thrips, white fly, botrytis, ...) improve photosynthesis, obtain optimal root temperature and weed control, etc.

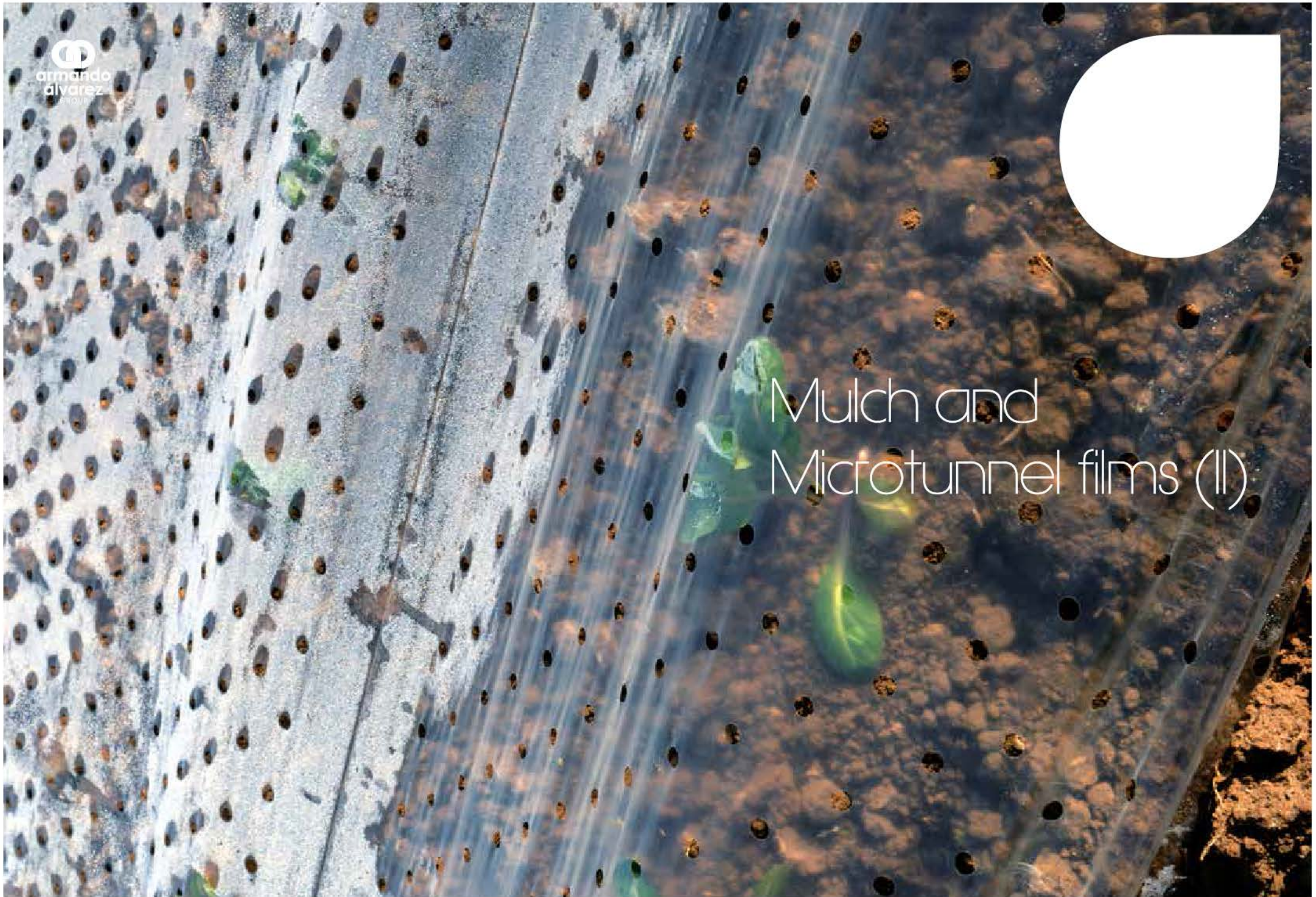
Mono colour combinations include opaque white, silver, photoselective green, photoselective brown, etc. Bicolour combinations include white/black, silver/black, yellow/black, photoselective orange/brown, etc.

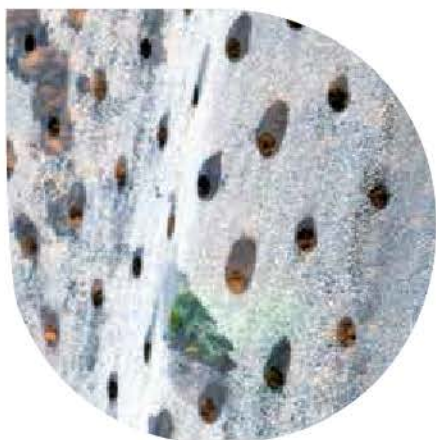


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Mulch and Microtunnel films (II)





TECHNICAL PRODUCTS

Solarization Film: employed to increase the rate of pathogen elimination and reduce the time necessary for efficient solarization.

Barrier Film for Soil Disinfection: employed to ensure impermeability to methyl bromide and other chemical gas treatments.

Thermal Blanket: developed for use as a floating cover to create a microclimate which favours crop precocity and development of better sized plants. The multiperforations permit constant ventilation for the crop avoiding thermal stress to plants.

Pocket Film: used for asparagus and other crops that need constant manipulation of the film on-field. It has pockets with

intermittent gaps that can be filled with soil as a fixing system and several perforations which serve for the evacuation of water excess. This design offers two main advantages: reduction of production cost and the increase of the film's life due to easier handling.

Biodegradable mulch: for use 45-90 days, degrades completely into compost. Enhances soil fertilisation, reduces labour costs and optimises waste management.

Oxo-biodegradable mulch: degradable film available in various colours for different on-field applications. Has a longer life span and breaks down into microscopic fragments.





Silage and crop packaging

The Armando Alvarez Group Agri Division is committed to continuous research and development of its silage products to enable customers worldwide to reduce storage and operational costs as well as assuring a high quality feed for the duration of the storage.





Silage Sheets (Bunker Covers): designed to offer excellent mechanical properties and resistance to tearing and impact in widths up to 19.5 meters.

All films are designed to cover fodder, grain, etc. and preserve its natural nutritional values. Impermeability to water is guaranteed and so is a low rate permeability to oxygen avoiding possible leakage of gases.

Specialty resins avoid premature UV degradation. Colour combinations (black, white/black, green/black, white/green and white/white) are available to reduce excessive heating of the fodder and achieve an optimal fermentation as well as allowing to maintain balanced internal temperature.

Under-Layer cover (clamp sheet): clear 40 microns film, available in different widths up to 19,5m. Used in traditional silage pits as a secondary barrier creating a vacuum under the cover and reduces oxygen pockets. Permits to eliminate top and shoulder waste.

Silage Bags (Grain-Bags): developed for the fermentation and storage of animal feed, silage bags offer more flexibility and advantages than traditional silage applications.

Silage bags can be used effectively with such crops as high moisture grains, dry grain, chopped dry forage used in stables and feed lots.

It allows for stand-alone forages such as corn, barley, sorghum, sugar beet, turnip, cabbage, as well as combinations like oats-barley, oats-corn.

Silage Bale Wrap (agri-stretch film): high performance film which will run on all wrappers for use on both round and square bale silage.

The technological design of the product reduces possibilities of tearing and puncturing while wrapping and provides an excellent air-tightness. Recommended for single or combi machines, high speed bale wrappers and extreme applications.

Our products offer exceptional stretch properties, resistance and durability for outdoors exposure for grass, sugar beet or maize silage. Silogress® and SuperGrass® are manufactured in multilayer co-extrusion technology using only premium grade Dowlex® polyethylene resins to ensure top performance under all wrapping and weather conditions.

Baler Twine: UV stabilised PP baler twines for big square bales, round bales and small square bales.

Fibrillated and twisted twine that offers excellent strength for high tension applications



Waterproofing Geomembranes (I)



CHARACTERISTICS:

- Each metre numbered and tracked for quality control and ease of installation.
- Latest flat die manufacturing technology and highly qualified staff.
- Multilayer Coextrusion Technology.
- Superior Welding Properties.
- Highly resistant to tearing and puncture.
- Excellent Chemical Resistance to organic and inorganic solvents.
- Quality Assurance Certificate issued for each roll.

APPLICATIONS:

Hydraulic works: drinking or irrigation water reservoirs, channels, ornamental ponds, water tanks and wells, aquaculture and fish farms.

Environmental works: urban refuse sites, industrial refuse sites, reservoirs for evaporation, purifying plants, pipelines, mining works (leaching reservoirs).

Civil Works: underground structures, landscaped coverings, roads, tunnels.

MAJOR ADVANTAGES:

- Wide range of thickness and lengths.
- High quality resins.
- Environmentally friendly.
- Highly cost effective solution to waterproof applications.

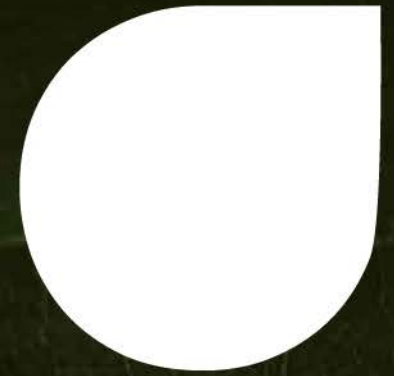
Our waterproofing geomembranes fully comply with the Quality Standards demanded for each market:

- *European Standards:* UNE-EN 13361:2005 (water reservoirs) // UNE-EN 13362:2006 (channels) // UNE-EN 13491:2006 (tunnels and underground works) // UNE-EN 13492:2006 (liquid waste dumps) // UNE-EN 13493 :2006 (solid waste dumps).

- *International Standards:* GRI GM13 (HDPE smooth and structured geomembranes) // GRI GM17 (LLDPE smooth and structured geomembranes).

- *Quality Certifications:* CE and ASQUAL .





Waterproofing Geomembranes (II)



Alvatech Liners

HDPE SMOOTH & STRUCTURED GEOMEMBRANES:

ALVATECH 5002 HDPE Geomembrane sheets are used for large engineering projects that require specific UV duration, resistance to highly corrosive chemicals and guarantee of non-porosity.

Manufactured in thicknesses ranging from 0.1 mm up to 3 mm, and available in two widths: 5.8 m for small projects and 7.5 m for major construction works to optimise installation performance and cut down on the amount of welding work.

ALVATECH 5002 HDPE Geomembrane is made of High Density Polyethylene (97%) and a variety of different additives such as: Carbon Black (as a UV stabilizer), Anti-oxidant Additives and Thermal Stabilizers.

LLDPE GEOMEMBRANES:

In thicknesses from 1 mm up to 2,5 mm, providing more flexibility and adaptability to irregular surfaces.

Recommended for floating covers and dump sealing.

LDPE GEOMEMBRANES (WATER RESERVOIRS):

Standard Water Reservoirs Film: in thicknesses of 0,25mm up to 0,4mm designed for traditional installation under sand and gravel.

Thermoweld Water Reservoirs Film: co-extruded in a thickness of 0,5mm /0,75mm with highly weldable materials in the external layers and materials of excellent mechanical properties in the central layer.

Bio- Heap Leach Membrane: It is a specific floating liner for bio-leaching in mining process.

The product is designed for good chemical resistance against sulfur and it has enhanced thermal properties to keep constant high temperatures inside the bio-heap leach pads.

Standard thickness 0,15 mm and available in widths up to 19,5 m .

VLDPE GEOMEMBRANES:

In thicknesses from 1 mm up to 2,5 mm. This product provides good mechanical properties and excellent welding. Recommended for waterproofing of uneven surfaces.



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Avda. Pablo Garnica, 20.
39300 Torrelavega (Cantabria).
SPAIN

Tel.: +34 942 84 61 00

Fax: +34 942 89 38 31

grupo@armandoalvarez.com

www.armandoalvarez.com

