SAFE CONTAINMENT

ATARFIL®
Geomembranes


THE CON

Atarfil is a multinational manufacturer of high performance plastic geomembranes, based on polyolefins (high density polyethylene HDPE, linear low density polyethylene LLDPE, very low density polyethylene VLDPE and polypropylene PP) intended for Safe Containment applications for Environmental Protection in the storage and encapsulation sectors of Household, Industrial and Mining Waste, or generally for waterproofing in major applications in Hydraulic Works such as storage ponds, drainage and water treatment.

Proud to be

STRATEGIC PRINCIPLES

Atarfil was founded in 1995 based on three strategic principles:

1

MAXIMUM SPECIALIZATION

Getting maximum specialization as a base to be relevant and to expand a real Global brand in a sector as specialized as **Safe Containment.**

2

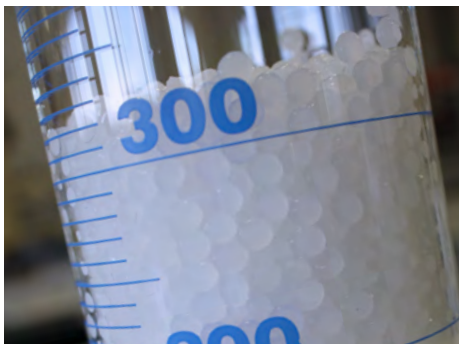
OWN TECHNOLOGY

As an indirect consequence of the above, our second principle is to own and thereby develop our own manufacturing technology for our products and, more specifically, to become a Global Leader in the manufacture of geomembranes by calendering, a process which has proven to produce products of superior quality over time.

3

RAW MATERIALS

There is no room for medium quality products for Safe Containment applications. That is why Atarfil carefully selects the raw materials to be used in producing geomembranes from a few suppliers with an excellent global reputation and leaders in innovation and quality. Therefore all materials used are of known origin, with maximum traceability and with widely contrasting and constant properties.



GLOBAL LEADER IN THE MANUFACTURE OF GEOMEMBRANES BY CALENDERING

Atarfil currently has manufacturing facilities in Europe, Middle East and America and sales operation offices in Spain, UAE, USA, Mexico, Turkey, India, South Africa and Australia. We are active in five continents with clients in more than 50 countries.

The installed production capacity is among the top three in the world and is a Global Leader in the Manufacture of Geomembranes by Calendering.

QUALITY CERTIFICATIONS

The company has the corresponding ISO 9001 quality certification and ISO 14001 environmental quality certification, as well as numerous international product certifications such as DIBT, ASQUAL, KIWA, DITE...
The company is also a member of prestigious national and international associations related to the world of geosynthetics: IGS (International Geosynthetics Society), IFAI (Industrial Fabrics Association International), GSI (Geosynthetic Institute), IAGI (International Association of Geosynthetic Installers) AIMPLAS (Technological Institute of Plastics).

BASIC COMPANY CULTURE PRINCIPLES

The company has gradually constituted a number of basic principles over the years which today make up the company culture of Atarfil.

They are a set of behavioural guidelines, beliefs and processes for any of our activities, including the analysis of the clients' needs, the process of making those needs ours, the preparation of solutions, product manufacturing and its market placement, respect for our competitors, the defence of our convictions and the advantages of our proposals, the behaviour of every member of the company, both internally and externally, in the social environment of every country in which we are present, and respecting our invaluable suppliers. These three principles are irremovable.

TRANSPARENCY

An essential premise in establishing trust with our clients and with our social and economic environment. Clarity, shared information and efficiency in activities is the only way Transparency is achieved in an organisation.

BUILDING TEAMS

We are all part of the same project, involving all participants and forming a team to reach a common goal: to find solutions for our clients under the premises of professionalism, efficiency and robustness.

SUSTAINABILITY

Products that support sustainable solutions in major social applications, such as environmental protection and water management. We encourage the smart use of resources through improving processes and responsible consumption. We believe Quality is the central axis of Sustainability.

Proud to be
www.atarfil.com

THERE IS NO WAY BACK

It takes a minute to decide which liner
The consequences last centuries

Atarfil, The High-End Geomembrane for Safe Containment applications

WASTE, WATER & MINING

Atarfil | Proud to be

ATARFIL
Geomembranes

?

WHAT DOES "SAFE CONTAINMENT APPLICATION" MEAN TO ATARFIL?

It is our field of activity. Our products are specifically designed to meet this need.

Waste products pollute the environment. Their toxic potential remains for decades and storing waste without an adequate containment process condemns entire generations to survive in environments hostile to human life.

Consequently, there can not be a quality scale for this application, which could be calibrated according the available budget.

They are widely known in the Industry, which are the necessary requirements for this important and demanding application.

Based on these premises, Atarfil probably provides the best option on the market in terms of cost-benefit.

This can be implemented also for applications such as hydraulic works where, although there is no risk of pollution there is great responsibility in terms of social and economic damage, which may occur due to the eventual failure of the storage and channelling of safe drinking water and water for irrigation. And of course for the environment, in the case of wastewater treatment.

The best option on the market in terms of cost-benefit.

QUALITY

WHAT DOES "QUALITY" MEAN TO ATARFIL?

In Atarfil, the term quality is not used in the same manner as in commercial sales pitches. It is a term that is considered an essential starting point.

A product can be excelent or not. Atarfil´s product has proven to be excelent, nonetheless for us, it is also very important the relationship with our clients, the regularity and consistency in the supply process.

So that, our clients know in advance the kind of product they will be receiving, with no surprises. This is true for any destination country without exception, as befits a genuinely Global brand intended for a need applicable to any country: Safe Containment.

That is why our return rate is zero. This is the differentiating factor. Similarly, we believe that no Atarfil sales representative or client can promote our product better than our product itself can.

EXCELLENCE

RETURN RATE "0"

Minimizing risk of leakage in the long term

MANUFACTURING BY CALENDERING SYSTEM (FLAT-DIE)

The flat-die geomembrane manufacturing system is widely known in the industry and is recognised as the type with the maximum uniformity in thickness and the best properties of all existing systems. It is used in many industrial lamination applications, which of course includes the manufacture of waterproofing geomembranes.

Its development is of a similar date to that of the blow moulding system. and essentially consists of a block of three cylinders arranged in parallel, of which the bottom two receive the extruded material from the flat extruder-header assembly of the same width. The cylinder assembly is called "calendered" and its objective is the thermal treatment of the product, the gradual cooling, straightening and the surface finish of the geomembrane which then dissipates heat in a long train of cooling at the end of which there is a tractor unit and a roller.

Atarfil has provided to this technology an in-house control system of the thickness uniformity as well as a special design of the calendering equipment which gives the product some unique properties.

A quick comparison between the blow moulding and the calendering systems allows the listing of the following aspects:
-Maximum uniformity in thickness in the calendered system which under electronic control conditions, such as in Atarfil units, a ± 3% thickness tolerance is reached.

Conversely, no blown film system can improve the thickness tolerance of ± 10%. This is due to the turbulence of the air blown inside the manufacturing column. The thickness control here is indirect compared to the flat die system, which is direct. This is of importance because a perfect weld also requires the perfect uniformity of the product for the preservation of the welding parameters.

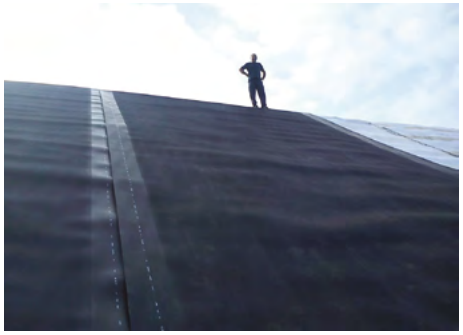
In the flat die system there is a true heat treatment of the base product, because it is in direct contact with the calender rollers assembly.

There is no calendering in the blow moulding system and therefore no heat treatment, except that which the blown air can provide. As explained below, the heat treatment is directly responsible for the final properties of the product.

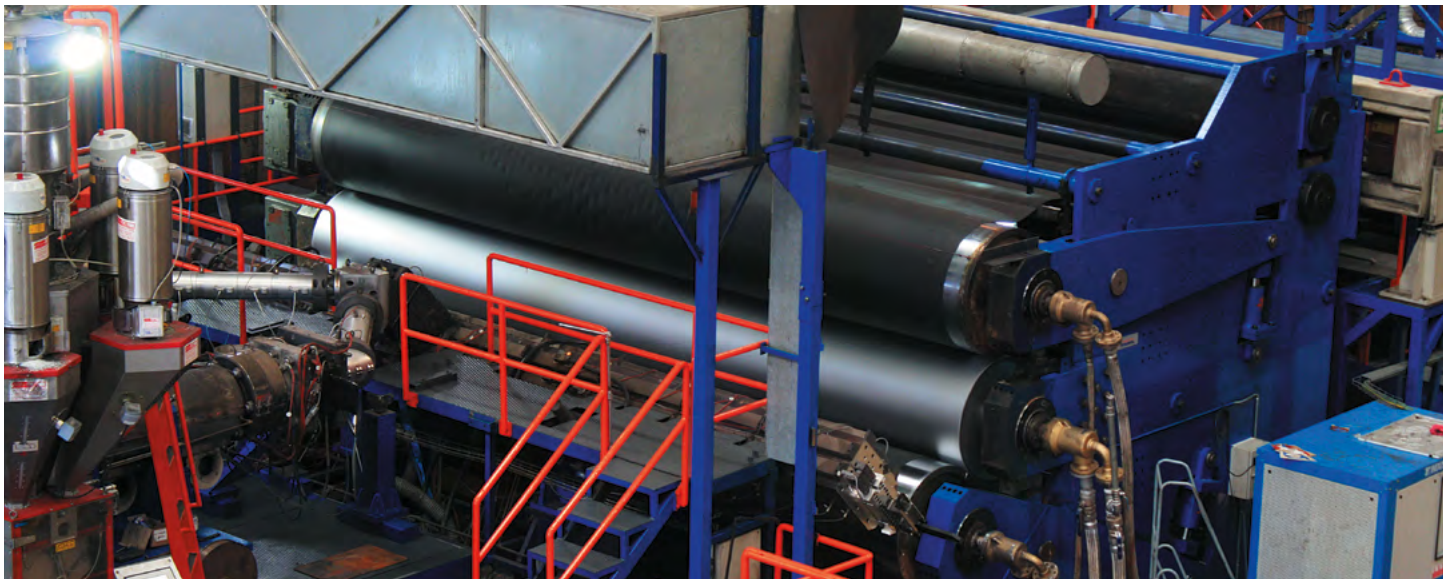
- Maximum flatness and uniformity of the surface appearance of the geomembrane which Atarfil has also supplemented with a special treatment via the rollers assembly to provide the top surface with a non-slip texture for easy installation.

- The absence of the typical longitudinal slots of the blown film system is the result of the partial folding process of the blow moulding column during the manufacturing process, and which are not necessary in the flat die system. The creases of the blow moulding system are material weaknesses, as is obvious, particularly in crystalline material such as high density polyethylene (HDPE).

CALEND



Maximum flatness and uniformity of the surface appearance of the geomembrane.



ERING

TEXTURED GEOMEMBRANES BY FLAT-DIE OR CALENDERING AND BLOW MOULDING

A textured geomembrane, also known as "roughened", is required when the application requires covering the material with a layer of soil on a slope. If the geomembrane does not have the necessary friction angle, the soil layer would slide over it when it is dry and especially in the presence of water at the interface.

Texturing is required in all cases on both sides and we recommend maximum caution in applications where texturing is recommended on one side only.

Currently there are three types of textured or roughened products on the market:

1 BLOW MOULDING

Texturing obtained during the manufacture of the geomembrane by injecting nitrogen in the blow moulding system.

The injection of nitrogen is not a harmless process. It significantly affects the final properties of the geomembrane, as evidenced by the example that the elongation at break of a smooth blow moulded product is much greater than the elongation at break attainable in the textured product.

2 CALENDERING (Flat-die)

Texturing obtained during the production of the geomembrane by calendering, thus providing a special texture to the Calendering rollers. Industrial Designation: Structured Geomembrane. This texturing is permanent because it belongs to the body of the geomembrane itself and enables smooth lateral strips which facilitate welding, which is not possible in the blown film process.

The smooth lateral strips also facilitate the cleaning process of the weld area, especially in cases in which there are large concentrations of dust and dirt on textured product in the work area, and for other products where there are no smooth strips, for which cleaning is almost impossible.

Calendering System provides identical properties to the smooth or to the textured products, as demonstrated by specific tests that can be performed on the smooth side of the textured geomembrane.

3 THERMOPROJECTION

Texturing obtained from the smooth sheet by the Thermoprojection of the Grain in a second manufacturing process.

In this system, the product is manufactured smooth and enters a new rolling and unrolling process passing through a specific texturing machine, different from the one used for its manufacture.

As is obvious in these types of products, we cannot guarantee the durability of the texturing in the medium to long term given that the adhesion of the grain projected onto the surface of the smooth geomembrane is subjected to a drying stress in the friction interface.

Each system has advantages and disadvantages. All systems provide adequate friction coefficients, although it is true that the durability of the texture and frictional performance, none exceeds the flat die system. To do this they must also have a certain level of roughness, which is 0.50mm at the minimum in international standards.

However, it is also shown that the greater the roughness, the greater the friction coefficient. Therefore, the products that do not meet the minimum roughness conditions cannot be considered textured and thus cannot be marketed under this name. They are products whose true technical utility is uncertain, and in many cases even contraindicated. In any case, they should be marketed as surface treated smooth products whose utility is still unknown, but never as true textured products.

TEXTURED

Atarfil offers two types of textured products, one with an asperity height of 0.9mm that can be described as the highest frictional performance on the market, and another with a 0.6mm roughness for applications which due to length of the inclined plane, gradient to traverse or support conditions do not require the maximum friction coefficient to be obtained while always maintaining a significant level thereof, as it could not be otherwise for such applications.

Roughness should never compromise the thickness of the geomembrane. It is always very difficult to know the actual average minimum thickness of the geomembrane in blown film systems, while in flat die systems it is known that the roughness is an addition to the average thickness of the product.

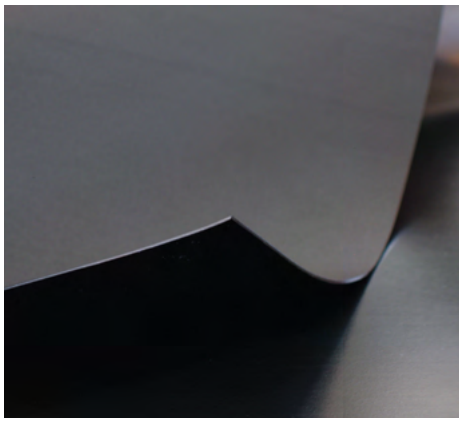
Finally, and in relation to the Atarfil product, several aspects should be highlighted:
The textured design allows you to overlay any other geosynthetic material and slide it over the surface to its final position without further hindrance. Once this has been carried out, the friction is fully developed and the installation is extraordinarily facilitated. When a panel is cut in wedge-shape transversal to the roll, the edges to be welded do not need to be polished with a sander to obtain a good quality weld. The Atarfil product is directly weldable without further precaution, including transversely to the texturing.

PRODUCT RANGE APPLICATIONS

PRO

There are four polyolefin materials within geomembrane applications.

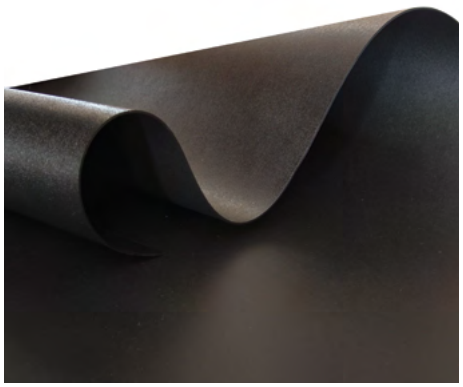
They all have a number of common characteristics, in addition to the individual characteristics which make them ideal for every application.



HDPE

High density polyethylene

HDPE is the required material application and a global standard in the field of Environmental protection applications: landfills, the sealing thereof, and in general all applications in which the combination of three fundamental properties is needed: maximum chemical resistance, maximum weather resistance (ultraviolet radiation and aging by atmospheric thermal cycles) and impenetrability to most gases which, in these applications, are usually present along with the product to be contained. By extension and given its specific characteristics, the product is also excellent in applications for Water Storage and Hydraulic works in general (channels, purification by impoundment, lakes on golf courses, aquaculture, etc.)

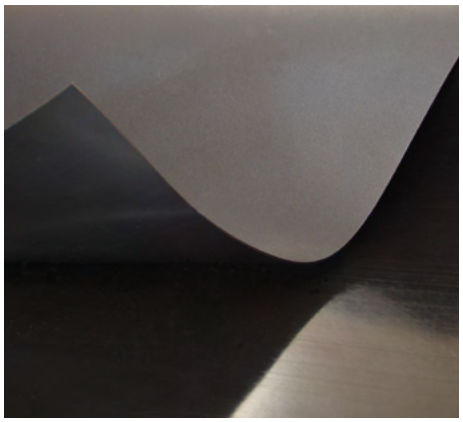


VLDPE

Very low density polyethylene

By contrast, the VLDPE presents the most extreme natural flexibility, which coincides with the maximum weldability and workability, even at the cost of losing a small percentage of UV resistance and an almost total absence of chemical resistance and impermeability to gases. It is a significantly more expensive product than the HDPE and specific to applications for adaptation to vertical walls, sharp angles, construction protrusions and backgrounds requiring material with high flexibility for the necessary adaptation to the support.

DUCTS



LLDPE

Linear low density polyethylene

The LLDPE is an intermediate product, between the previous two, and represents a wide range of medium flexibility products, among which there are materials with a high chemical resistance at the top of the range, even suitable for installation in environmental applications and others that are without resistance and which therefore could only be used with certain restrictions in water storage solutions. The resistance to UV radiation and aging cycles is also very different between the two extremes of the range.

PP

Polypropylene

Polypropylene (PP) is a material that matches the high flexibility, although with a lower weldability than VLDPE, and with a high chemical resistance similar to that of HDPE. Therefore, the conclusion to be drawn is that it is a characteristic material of protection against corrosion applications or storage tanks and reservoirs of certain aggressive, corrosive or polluting chemicals in general.

PRODUCTS APPLICATIONS

PRODUCTS

From these materials, the Product Catalogue offered by ATARFIL is very broad:

- High density polyethylene geomembranes. (HDPE)
- Other types of polyethylene geomembranes. VLDPE (high flexibility) and LLDPE (linear low density).
- Coloured / Coextruded bilayer geomembranes.
- Conductive Geomembranes.
- Textured Geomembranes on one / two faces, including textured in colour.
- VLDPE (Atarflex) or PP (Atarpol) geomembranes with / without polyester mesh reinforcement
- LLDPE geomembranes with / without polyester mesh reinforcement.
- Translucent Geomembranes or with a signage layer for use in tunnels.
- Special Geomembranes for high temperatures, soluble, self-extinguishing, safe drinking water, biodegradable, etc.
- Complementary products and special pieces (PE profiles for concrete embedmend, welding wire, input / output pipe connections, inspection chambers, junction pieces, colaminated plates, etc.)

APPLICATIONS

The list of Applications is extremely broad, including but not limited to:

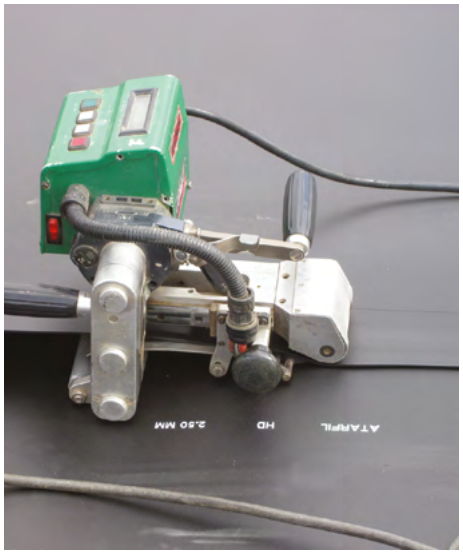
- Mining storage platforms.
- Mining containment ponds.
- Mining treatment plants
- Urban and industrial solid and liquid waste landfills.
- Landfill capping
- Temporary landfill covering.
- Water ponds.
- Golf course and ornamental ponds.
- Channels and safe drinking water reservoirs.
- Water purification by impoundment, digesters.
- Aquaculture.
- Tanks, reservoirs and channelling for Industry.
- Tunnels.
- Floating covers
- Building, industrial building, car park, basement decks, etc.
- Protection against corrosion.
- Shading Covers to prevent Evaporation.
- Erosion control.

SERVICES

INSTALLATION AND OTHER SERVICES

In addition to the products offered, a wide range of Support Services are offered:

- Quality control laboratory.
- Manufacture of custom items, boots, inspection chambers, junction pieces, etc.
- Technical Consultation. Advice on the design of the waterproofing solution.
- Geomembrane aging monitoring
- Factory prewelded panels and colamination with other geosynthetics.
- Prefabricated sleeves for sheet metal reservoirs.



STRUCTURE

WORLD TRADE STRUCTURE

Three production plants: Europe, Middle East and America.

Operation centers and sales offices in Spain, UAE, USA, Mexico, Turkey, India, South Africa and Australia.

Installer Clients approved in over 50 countries.

Atarfil Europe

Atarfil Middle East


Atarfil America

FAQ COMMON ISSUES IN THE GEOMEMBRANE INDUSTRY THAT ARE GOOD TO KNOW

The product is designed to fit your needs

It is an undeniable fact that the product must be adapted to the specific needs of the client. There are local laws, including requirements for labelling or transportation, certifications, regulations, rules or laws.

Each work or application has a specificity that makes it unique. However, on the basis of this conviction, we cannot forget the absolute truism that a Safe Containment need for a usual type of pollutant should not be very different from one country to another or from one client to another. The Safe Containment objective is achieved based on certain limits which are common around the world.

The product is requested to be textured when not needed

A textured product is either needed or is not. If it needs to be textured is should be, and if not it should be smooth. This apparent truism needs to be remembered in many cases in which a product is specified for a project which clearly does not qualify to be designated as textured yet is designated as such, creating a huge confusion about the uncertainty of the client's needs. If the client does not clarify they require, it is hardly feasible to offer the right solution in conditions comparable to any concurrent company.

The width of the Roll

Is a Geomembrane with a wider roll better? There is a technical limit for manufacturing geomembranes. In high density polyethylene (HDPE), this is 7.5 to 8m. Beyond this limit, either the raw material is not an HDPE and is instead a softer material which enables the extrusion-header system of the machine to complete the geomembrane transformation cycle, or the uniform thickness or thermal treatment parameters of the raw material have been seriously compromised. Within these limits and exceeding a minimum width, under which it would be unreasonable to present a product for the Safe Containment application, the roll width is the choice of the manufacturer, usually subject to the presentation format and transport cost optimisation.

There is hardly any difference between the cost of machines for given widths.

Within these limits, it is true that a wider roll relieves installation costs in large projects by a small percentage; however it is always at the expense of a higher cost of handling bulk unit weight of the roll or overruns in the finishing of curves or corners.

Confusion between LLDPE and HDPE

Linear low density polyethylene (LLDPE) and high density polyethylene (HDPE) are raw materials which are similar in terms of composition, but very different in their behaviour, as has already been discussed in previous sections.

HDPE has become a global standard for Safe Containment applications precisely for its unique properties and marketing an LLDPE as an HDPE in these applications is tantamount to offering a substitute product without any benefit to the client. Differentiating them is very simple. Requiring the MFI parameter would be sufficient. Below 1.2 for 190/5kg is an HDPE, and above is not. It's as simple as that.

What is a TPO?

It is a Thermal Poly Olephyne based geomembrane. In other words, any mixture integrating different proportions of any of the four polyolefins would be a TPO. Without mentioning which mix, given that each polyolefin has its own properties and different base price, comparing the performance and price of two TPO market products becomes an impossible exercise.

Product thickness

A property that is apparently very obvious to determine, such as the thickness of a geomembrane, becomes guesswork. We distinguish between average thickness and tolerance in ± a specific percentage %, according to the industrial rolling process followed.

The property is clearly defined up to this point. The client may even be convinced of actually purchasing a particular product weight equivalent to the surface by the average thickness and product density. It is a physical principle and it would enable comparing different products with one another.

The confusion arises when "nominal" thicknesses are mentioned, leaving these up to the manufacturer who "designates" his product as a specific thickness when phrases such as the average minimum thickness is the nominal thickness "less" 10% and the tolerance is -10%, appear in its description. In short, the product could actually be at least 20% of the "nominal" thickness. We'll leave the significance of this to the discretion of the Client.

FAQ


ATARFIL®
Geomembranes
Proud to be
SAFE
CONTAINMENT
WASTE, WATER & MINING

ATARFIL
Geomembranes

www.atarfil.com
comercial@atarfil.com

Atarfil Europe

Ctra. Córdoba Km. 429
18230 Atarfe (Granada)
Spain

T.: +34 958 43 92 00

Atarfil Middle East

P.O. Box 263122
Jebel Ali
Dubai (UAE)

T.: +971 4815 3555

Atarfil America

324 Moore Avenue
Suffolk, VA 23434
USA

T.: +1 757 263 4057