

THE  
**BLEACHING**  
**EARTHS**  
BROCHURE





# A NEW GENERATION OF BLEACHING EARTHS

Geohellas's bleaching earth products  
make for effective purification, ensuring  
increased adsorption of contaminants  
and reduction of oil loss.

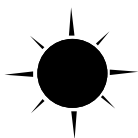
By offering a complete product range that makes  
nutritional, environmental and economic sense,  
Geohellas helps producers  
get the most value out of their refining process.

# BLEACHING EARTHS PRODUCTION PROCESS

SELECTIVE MINING  
ACCORDING TO  
SPECIFICATIONS  
OF END-USE



NATURAL  
DRYING



TRANSPORTATION  
FROM MINE TO PLANT

PRIMARY  
CRUSHING



DRYING



ACTIVATION PROCESS  
(THERMAL AND/OR ACID)



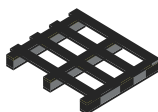
MILLING (POWDER PRODUCTS)  
OR SIEVING (GRANULAR PRODUCTS)



PACKING



WAREHOUSING





## Edible Oils

### A SUSTAINABLE APPROACH TO EDIBLE OIL REFINING

Geohellas provides natural, thermally activated and acid activated bleaching earths that help edible oil producers set higher quality standards for their output at peak production efficiency, while addressing environmental concerns and meeting processing regulations.



# Edible Oils

## COMPLETE RANGE OF BLEACHING EARTHS

Geohellas's MAK® bleaching earths are recognized for their high quality and consistent performance. Available in different varieties suitable for a wide range of oil types and refinery needs, they enable efficient bleaching of edible oils, reducing oil loss and increasing the rate of filtration. MAK® bleaching earths are also available with activated carbon.

*MAK bleaching earths are HALAL and KOSHER Certified and comply with FEDIOL code of practice.*



## Edible Oils

### NATURAL BLEACHING EARTHS

MAK® LITE and MAK® 100 bleaching earth series are natural clay products. They are sun-dried, crushed, milled, and subsequently dried to less than 150°C to remove incipient moisture and improve workability. Since solar heat and mild heating is used to remove innate moisture, these products are more environmentally friendly and sustainable. In addition, these clay products contain no additives, i.e., chemically treated. For naturally dried clays, their bleaching performance has been primarily deemed suitable for a wide range of oils and fats.



### THERMALLY TREATED BLEACHING EARTHS

MAK® 300 and MAK® 500 series are clay products that have been thermally treated (calcined) to provide superior bleaching performance for demanding oils and fats. Although these products are more energy-consuming, the presence of both attapulgite and smectite (small amounts) in naturally occurring mixtures during effective calcination at 300°C, combined with rehydration processes of smectite flakes, have shown superior results for the bleaching of oils and fats. During calcination, attapulgite crystals fold and smectite flakes expand, so the resulting restructuring of the mixed clay micro-texture increases the porosity and the active surface area of the product. Thus increasing also their oleophilic behaviour.





# Edible Oils

## ACID AND HEAT TREATED BLEACHING EARTHS

MAK® 600 series are clay products that have been both thermally and acid treated. Following selective mining, this dual process results in an enhanced absorptive performance and an excellent solution for handling incoming oils with an increased soap and phospholipid content. Calcined clay is rehydrated with an acid solution, which improves further the active surface area of the final product.



# MAK<sup>®</sup>

Clarification Adsorbent

# RO

## Industrial oils

### EFFICIENT RECOVERY OF USED LUBRICANT OILS

Geohellas has developed a complete range of clay adsorbents for the treatment of used industrial oils, prolonging their life-cycle, so that they can be reused in the process with considerable economic return.

#### SPECIALTY ADSORBENTS FOR CLARIFICATION

Our MAK<sup>®</sup> RO product series offers efficient adsorption of contaminants during purification process of used lubricating oils. Made from attapulgite and saponite, MAK<sup>®</sup> RO products, take advantage of their very high surface area (250 m<sup>2</sup>/g) and the mesh type structure, which helps trap impurities and achieve optimum quality of the industrial oil. MAK<sup>®</sup> RO adsorbents are ideal for prolonging the service life of lubricating oils in the metalworking industry and serve as an efficient filtering aid producing a high-quality clarified oil in the processing of transformer and used engine oils.





# MAK<sup>®</sup>

## Adsorbent

## Biofuels

**ADVANCED ADSORBENTS FOR THE PRE-TREATMENT OF NEW RENEWABLE FUEL FEEDSTOCKS AS PART OF SUSTAINABLE GROWTH**

New types of feedstocks that are produced from biomass, such as used vegetable oils, fats and other residues of the edible oil refining process, require new efficient filtration technique before they could become useful again. Geohellas provides effective adsorbents for their treatment ensuring the maximization of biofuel production yield.

### **PURIFYING AGENTS FOR BIOFUEL TREATMENT**

MAK<sup>®</sup> adsorbents have been developed especially for the treatment of spent vegetable oils and fats to produce higher quality biofuels. By effectively removing impurities from waste oils, MAK<sup>®</sup> adsorbents ameliorate the filtration rate, enhance the production process of sustainable biofuel, minimize oil retention and contribute to high-quality biofuels yielding economic and environmental benefits.





## Jet Fuels

### JET FUEL AND KEROSENE TREATMENT

Aviation industry needs safe, high quality fuels for refueling and oil refineries must meet stringent, international specifications of fuels. Geohellas has developed a complete range of attapulgite adsorbents for jet fuel purification and kerosene treatment.

### CALCINED ATTAPULGITE FOR JET FUEL TREATMENT

MAK® JF product series is made from top quality attapulgite clay, engineered for treating aviation fuels. A specialty mineral that adsorbs efficiently organic surfactants, organometallic compounds, such as copper complexes and solid particles, thus prolonging operation of jet engines.

With an active surface of 250 m<sup>2</sup>/g, due to their mesh type structure, MAK® JF products guarantee longer fixed bed performance versus common clays and higher fuel per clay ratio. MAK® JF are non-swelling, filtering aids, suitable for a wide range of process plants and incoming fuels. Supplied in a variety of granulometry, they have a low dust content that assures greater production cycles.



ACTIVE SURFACE AREA  
 $9.5 \times 10^9 \text{ m}^2$



Average  
Clay



ACTIVE SURFACE AREA  
 $4.5 \times 10^9 \text{ m}^2$

### Typical Properties of MAK® JF Series

	MAK JF 2100	MAK JF 2200	MAK JF 2300	MAK JF 2400
Volatile Classification	LVM	LVM	LVM	LVM
Granulometry (Mesh)	8/14	16/30	18/60	30/60
Free moisture (%)	<3	<3	<3	<3
Density (Kg/m <sup>3</sup> )	0.6	0.62	0.62	0.63
pH (5% suspension)	8	8	8	8



# QUALITY STANDARDS



During all stages of the production process, quality is carefully monitored by Geohellas's Quality Control Department, through an advanced quality management system that conforms to the ISO 9001:2015 norms as certified by Lloyds Register.

Geohellas has also been accredited with ISO 9001:2015/HACCP by Lloyd's Register for the production of our Bleaching Earths.

Our specialized products for the edible oil refining sector are also HALAL and KOSHER Certified and ensured to comply with FEDIOL code of practice.

Our commitment to respect and protect the environment is also reflected by our ISO 14001:2015 certification by Lloyd's Register.

Our Quality Control laboratory is staffed by highly trained technicians and is equipped to carry out all routine analyses, as well as complex, application-related analyses.

Geohellas Quality Policy ensures our efforts focus on always achieving the result expected by our customers on time, upon first attempt and at the lowest possible cost. Quality starts from and depends upon each one of us.



# **RESEARCH AND DEVELOPMENT**

With a primary focus on high performance, value-added-added products, Geohellas invests heavily in R&D. Our R&D team consists of 15 staff members employed in various research activities.

Geohellas R&D laboratory is fully equipped for materials characterization and new product development. Possessing a wide range of capabilities we deliver technical clays for new and special applications in collaboration with other companies and institutions. These capabilities include those offered by our highly flexible plant, but also a large variety of laboratory and pilot scale equipment for applications testing and the production of niche products.

By close collaboration with universities and institutes around the world, we incorporate the best available knowledge in clay processing into our products.







**we make  
sustainable  
sense to your most  
complex bleaching  
challenges.**



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