

**LOCATION:
STRATEGIC SITE**

B
Bilbao

Bilbao (Spain) 15 km

International Port Bilbao
(Spain) 25 km

Airport 8 km

Connection for the European
motorway network



Filtration Solutions



TÉCNICAS HIDRÁULICAS S.A.
Aritz Bidea, 65. Apdo.17 · 48100 Munguía, Vizcaya - Spain
T: +34 946 740 500 · F: +34 946 744 910 info@thsa.com · www.thsa.com
GPS: N 43° 20.95' - W 2° 49.50'



THE COMPANY SINCE 1966

Since 1966 Técnicas Hidráulicas, S.A. has been developing leader technology and offering premium service. TH Minerals is a division of the parent company which it is focused on the Mining and Metallurgy Industries providing solutions in the Solid-Liquid Separation Field.

TH Minerals is quite involved in the Mining Industry and not only trough the filtration field. Rover Asteca is a company of the Técnicas Hidráulicas Group that counts on a 45 years experience in the crushing and screening field manufacturing equipment for mines and quarries. The cooperation and technology transfer is very intense between both companies and in this manner TH Minerals can better understand and solve every customer need that could arise when facing a turnkey project.

TH Minerals reference list is quite significant and it counts on a large variety of applications and customers. TH Minerals has been working and cooperating with the most important mining and metallurgy companies in the word passing through the most exhaustive and large quality controls. Some of these references are such as "Jing Chen" for China National Coal, "Mafube Colliery" for Anglo American, "Bellary" (Iron ore) for Hari Machines, "Phola Coliery" for BHP Billiton, "Matomo" (Platinum Concentrate) for Sylvania Metals or "Befesa Zinc Aser" (Zinc oxide) for Abengoa Group.

TH Minerals experience giving filtration solutions is quite significant and it is spread worldwide. The philosophy of the company has made possible that TH Minerals technology has been taken place in several countries around the word such as:

- China
- India
- USA
- England
- Belgium
- Botswana
- South Africa
- Portugal
- France
- Poland
- Iran
- Taiwan
- Switzerland
- Zambia
- Vietnam
- Italy



THE APN FILTER PRESS

APPLICATIONS & EQUIPMENTS

TH Minerals filtration experience has been achieved not only in the mining industry but also in the construction, chemical, metallurgy and environmental industry. Every dewatering process is different; In order to design the most suitable filtration equipment TH Minerals provides filtration test services either in the TH Minerals facilities (sending a sample) or directly in the site. There are mobile pilot test units that can be sent to the site.

Applications

High Density Slurries (Minerals)

Copper, hematite, magnetite, lead, gold, molybdenum or platinum among the others. Top feeding system, special cloths and continuous manifold cleaning will be necessary to avoid wearing or manifold blocks.

Low Density Slurries

Coal concentrate, coal tailings, kaolin, glass dust, marble, concrete, dredging and organic or inorganic waste. Individual chamber feed through hoses obtains a uniform and fast chamber filling.

Equipments

APN Filter Press

Based on a "mechanical simplicity" in order to obtain the maximum reliability. Required moistures will be achieved by air blowing, draining and pressing.

APN-M Membrane Filter Press

For heterogeneous slurries, mechanical pressing through a membrane at high pressure will obtain more handleable cakes and required moistures with lower operating costs.

BENEFITS

The APN Series Filter Press has been specifically designed for the Mining Industry. The steel core plates and structure and the "simplicity design" technology makes this filter press be the market leader in robustness and reliability. Since 1970, every re-engineering of the APN series Filter Press is the consequence of a quality product that is continuously adapted to every process and client requirements.

APN Main Features

Simplicity Design

TH Minerals philosophy in the Mining Industry has always been conservative. Sometimes mines are located at very remote areas; the maintenance of APN Filter Press does not require any technician or additional tools. The objective when designing the filter press is to obtain reliability and the minimum operational costs.

Fast Opening System

The opening of the filter press and cake discharge is done in less than one minute by means of the cake discharge system.

Efficient Electrohydraulic System

It ensures the minimum energy consumption. Both the filter press and the slurry feed pump are driven by the same power unit.

The Filter Plate

Its steel core avoids any breakage and its flat surface ensures the cake discharge. Its rubber seals in the perimeter of the plate ensure the tightness of every chamber, avoid damages in the perimeter of the plates (that will decrease the drying efficiency) and allow increasing the production only by modifying its thickness.

Fully Automatic

The PLC manages every filter press operation being able to control all the different processes during the filtration cycle. The PLC can be interconnected to the main control room.

Water Recovery

The rubber seals and the water collecting manifolds allow the APN Filter Press to recover the 100% of the filtrate during the dewatering process.

Other Technologies

APN Filter Press design is individual depending on each process requirements. Draining System, Cake Moisture Detection System, Cake Washing System, Cloth Washing System, Core Blow System or Second Side Air Drying Systems are features that can be added to the filter press to obtain the best results for the process.

Top Feeding System

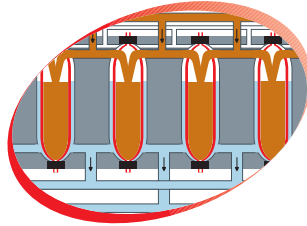
Feeding from the top of the plates through a main manifold and core blowing reduces wearing and avoids material settlements.



THE PROCESS

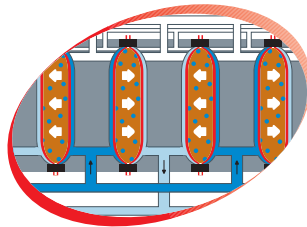
1. Filling and Filtration

All the chambers are filled at the same time in order to avoid differential pressures. During filtration the filtrate is displaced through the cloths and solids are kept inside the chambers. Filtration stops when the desired solids concentration is reached.



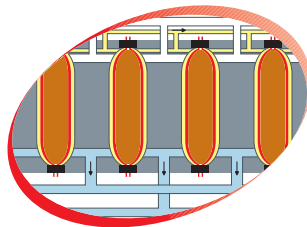
2. Cake Washing

After filtration wash water is pumped into the chambers in order to remove the mother liquor. The wash water is pumped through the filtrate manifold of one side of the filter press and it is collected in the filtrate manifold of the other side.



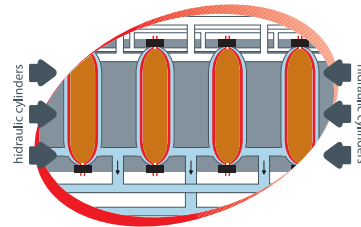
3. Draining

A short air blowing is done from the top of the plates between the cloths and the filter plates in order to remove the remaining filtrate. This process is very beneficial in order to avoid the introduction of the filtrate into the cake during air drying process.



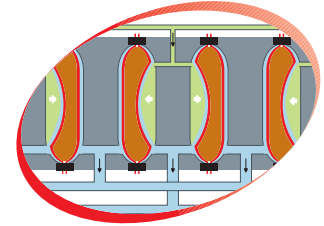
4a. Squeezing

Simultaneously to air drying process a mechanical squeezing of the cake is carried out by compressing the plate seals. This process optimizes the air drying process and reduces the compressed air consumption by closing the voids created by the removed filtrate when drying.



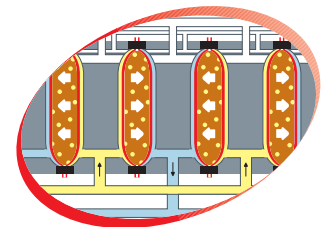
4b. Membrane Squeezing

The filter cake is dewatered mechanically by squeezing with a membrane at high pressure. For heterogeneous slurries this process enables to dewater the filter cake and to optimize the air drying process.



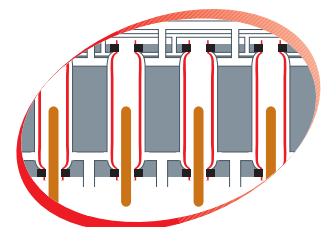
5. Air Blow. Drying

Low residual moisture is achieved. Filtrate is removed by blowing compressed air through the cake. During air blow drying process the filter cake remains under pressure to reduce compressed air consumption.



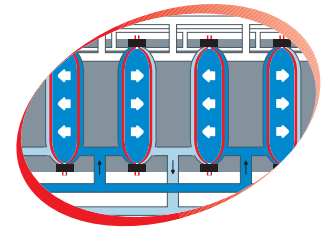
6. Cake Discharge

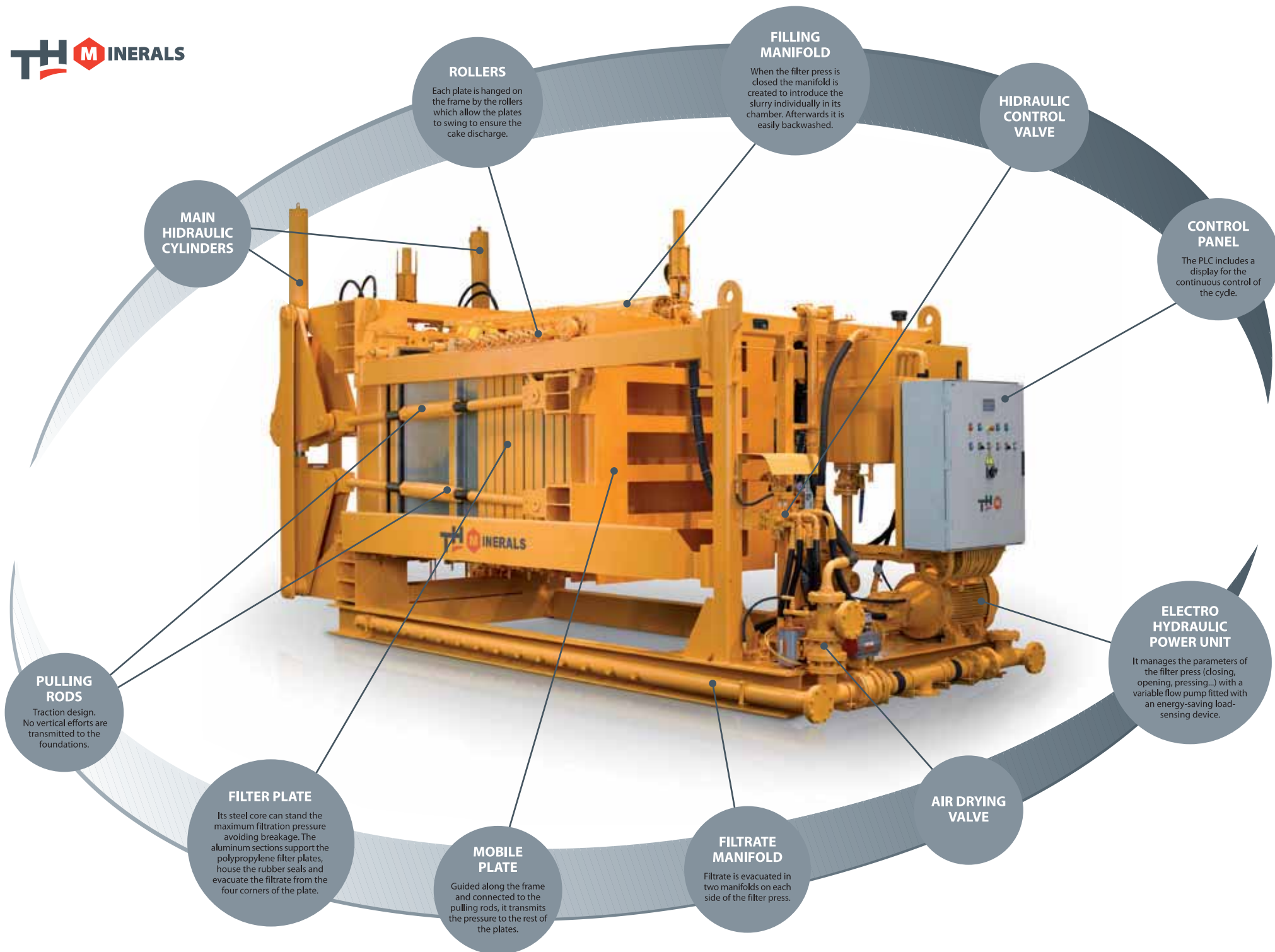
Once the desired moisture has been achieved the filter press opens automatically to allow the filter cakes to fall out of the filter. Cake discharge is 100% ensured due special plate design and cake discharge mechanism.



7. Cloth Washing

Once the cake discharge has finished fresh water is pumped from the back side of the cloths into the chambers in order to remove any remaining material that could be stuck into the cloths. The water current can flow in both directions.





TECHNICAL DATA

The following templates will show the most representative filter presses that are designed for the Mining Industry. The following equipments will achieve dry productions from 2 - 45 tons/h.

TYPE	APN16 Q	APN16 M8	APN16 M12	APN16 L18	APN18 L18
Cake size (m)	1350 x 1350				1700 x 1700
Number of cakes	4	8	12	18	18
Filtering surface	14,6	29,2	43,7	65,6	104
Pressure of hydraulic cylinder (bar)	240	240	240	240	240
Filter press power (kW)	2	3,5	11	11	11
Dimensions (mm) Length x With x Height	2100 x 1960 x 220	4100 x 2232 x 2086	4100 x 2232 x 2086	4900 x 2232 x 2086	6650 x 2511 x 4900
Compressed air without drying (N l/min)	190	320	480	720	1.100
Compressed air with drying (N l/min)	760	1.200	1.920	2.880	4.000
Air receiver (N l)	500	800	1.200	1.600	2.300
Weight (Kg)	11.000	15.000	18.000	30.000	41.000

Variable values depending on the process.

Each equipment dimensioning will depend on the process requirements and type of slurry. The following equipments will achieve dry productions from 25 - 325 tons/h.

TYPE	APN18 L24	APN18 SL32	APN20 SL40	APN25 SL45	APN25 SL60
Cake size (m)	1700 x 1700		1900 X 1900	2850 x 1850	
Number of cakes	24	36	40	45	60
Filtering surface	138	208	266	475	633
Pressure of hydraulic cylinder (bar)	240	240	240	350	350
Filter press power (kW)	11	22	22	22	22
Dimensions (mm) Length x With x Height	6650 x 2511 x 4900	6650 x 2511 x 4900	13000 x 2800 x 2500	13500 x 2800 x 4900	14500 x 2800 x 4900
Compressed air without drying (N l/min)	1.500	2.200	3.000	5.000	6.000
Compressed air with drying (N l/min)	6.000	8.000	11.000	20.000	25.000
Air receiver (N l)	3.300	4.500	6.000	11.000	14.000
Weight (Kg)	49.000	75.000	100.000	150.000	180.000

Variable values depending on the process.



THE APN SIX SLURRY FEED PUMP

A key feature of a TH Minerals Filtration System is the APN SIX Piston Membrane Slurry Pumps. Slurry pumping process could take place through very tough conditions and the APN SIX Slurry Feed Pump design ensures reliability and robustness. Main characteristics are the following:

Maximum reliability and effectiveness

Its hydraulic performance makes it a robust machine that has been designed to work with all types of difficult slurries.

Positive displacement

It maintains the flocculation improving filtration.

Easy maintenance

The accessibility in order to replace clapets and membranes permits a fast and easy maintenance.

Low wear down due to only one moving part and its positive displacement

The speed of the slurry in the pumping chamber is quite low compared with centrifugal pumps. The life of the APN SIX pump and its components is very high even working with abrasive slurries.

Low energy consumption

Both the filter press and the slurry feed pump are driven by the same hydraulic unit that includes the load sensing system in order to adjust hydraulically the pressure and the flow.



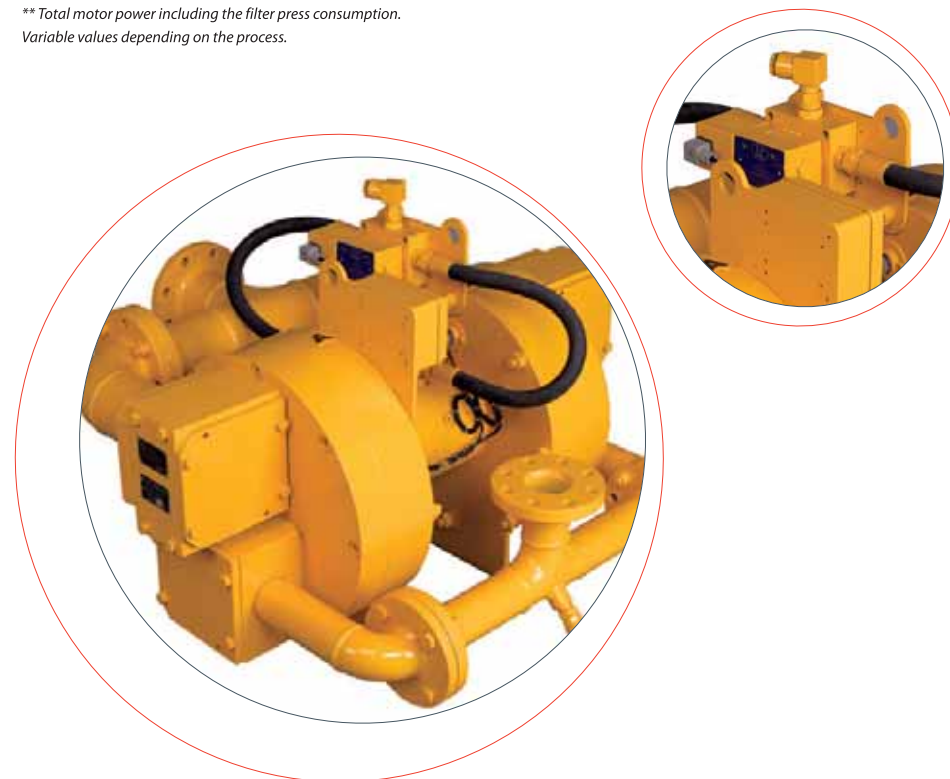
TECHNICAL DATA

TYPE	SIX 2C	SIX 6CS	SIX 10C	SIX 20C	SIX 40C
Nominal flow (m ³ /h)	3	20	40	80	200
Working pressure (bar)	16	16	16	10*	10*
Dimensions (mm) Length x With x Height	740 x 550 x 540	1055 x 1115 x 700	1650 x 1175 x 900	1860 x 1695 x 1060	2770 x 2200 x 1355
Oil flow (l/min)	7	30	60	80	200
Oil pressure (bar)	200	200	200	180	180
Motor power (kW)**	3	11	18,5	22	37
Weight (Kg)	180	605	1770	3320	8400

* Upon request the working pressure can be increased up to 16 bar.

** Total motor power including the filter press consumption.

Variable values depending on the process.



THE EXPERTISE • SERVICE TEAM

Individual Needs

TH Minerals offers an important experience in dewatering and filtration turnkey projects. TH Minerals service team will count on a Project Manager that will be the link between the client and the company. At the same time, every TH Minerals department involved in a project will count on a department responsible to face any requirement from the client.

From the order until commissioning TH Mineral commitment will be to obtain a project excellence.

Test Pilot Unit and Test Report

TH Minerals Test Pilot Units can be sent anywhere in the world. Tests will be carried out directly on the site under the current process conditions. Besides, samples can be sent to TH Minerals facilities in order to be tested in the laboratory test unit. After discussing such results with the client a test report will be issued.

TH Minerals Test Reports provide test process conditions, the results obtained and the recommendations of the most suitable filtration system. Every moment the client will be advised to take the best solution.

Worldwide Client Service

TH Minerals offers a fast response and variety of services. Services that are usually required by the clients are maintenance and training works, productivity improvement reports, spare parts / wear parts orders or Solid-Liquid Separation consultancy.

TH Minerals counts on a net of subsidiaries and agents around the world with a large experience in mineral processing that will be close to the client in order to give the best service possible. Since 1966 TH Minerals After-Sales Services guarantees performance for life.

A Quality Product and Company

TH Minerals Quality Control includes all the process from the initial phase of design, calculations, definition and selection of materials to the exhaustive protocols of manufacturing and tests, which are followed up during the manufacturing phase, such as welding controls, measurements or sealing.

TH Minerals Quality Control procedures guarantee that the equipments are fully tested and updated to the latest technologies and requirements from the market. In addition TH Minerals is accredited with the ISO 9001 Quality Management Certification and the New Machinery Safety Directive 2006/42/CE.

