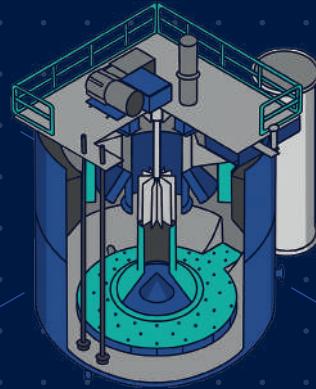
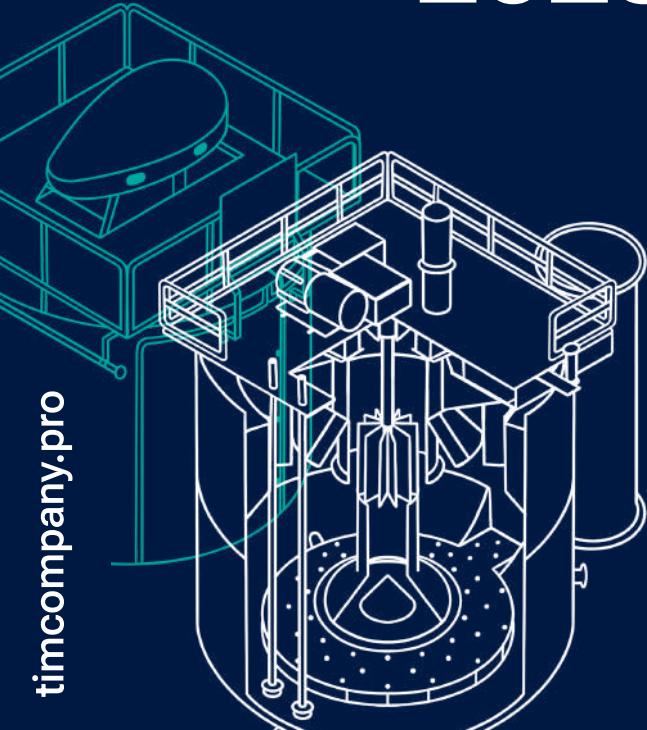




PROCESS AND[®]
MECHANIC

2023



- We are a Russian company producing high-tech and high-quality equipment for the mining, chemical, and food industries and public utilities.
- Turnkey engineering, process re-equipment and upgrading are carried out by our process engineers on the basis of scientific knowledge, calculations, and process design.
- The company's professionals perform high-quality equipment maintenance for keeping it in good condition, identify and eliminate potential hidden faults, and carry out timely repairs.



PROCESS AND[®]
MECHANIC



Attention! Equipment performance data are average and largely depend on physical and chemical properties of a material, as well as on conditions of its use. To select equipment, please contact P&M professionals.

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TIMAX HEAVY MEDIUM DRUM SEPARATOR

The drum separator is a reliable, time-tested mechanism. The device has the highest specific performance per unit volume of the bath.

**Equipment for enrichment in heavy media of coal
graded**

6 to 250 mm

Enrichment method

The separator operation is based on the gravity separation of the material in the weighting agent suspension. A product with a density less than that of the working suspension floats to the surface, and the one with higher density sinks to the bottom of the drum.

Mechanism operation principle

The material enters the rotating drum through a hole in the front end wall. Next, the coal concentrate moves to the discharge chute due to the slight inclination of the separator. The remaining rock fraction is removed from the unit by rotating blades fixed on the inner surface of the drum.





Advantages

High performance
(in comparison with other
separator models)

1

Simplicity and reliability
of design

2

Suspension density stabilisation
at high separation densities

3

Sizes and performance

Drum size
(diameter × length), m

3x3

3x4

4x3

4x4

Capacity
t/h (for + 12 mm fraction)

~ 160

~ 200

~ 365

~ 450

Capacity
t/h (for + 6 mm fraction)

~ 150

~ 180

~ 270

~ 370

TIMAX SEPARATOR

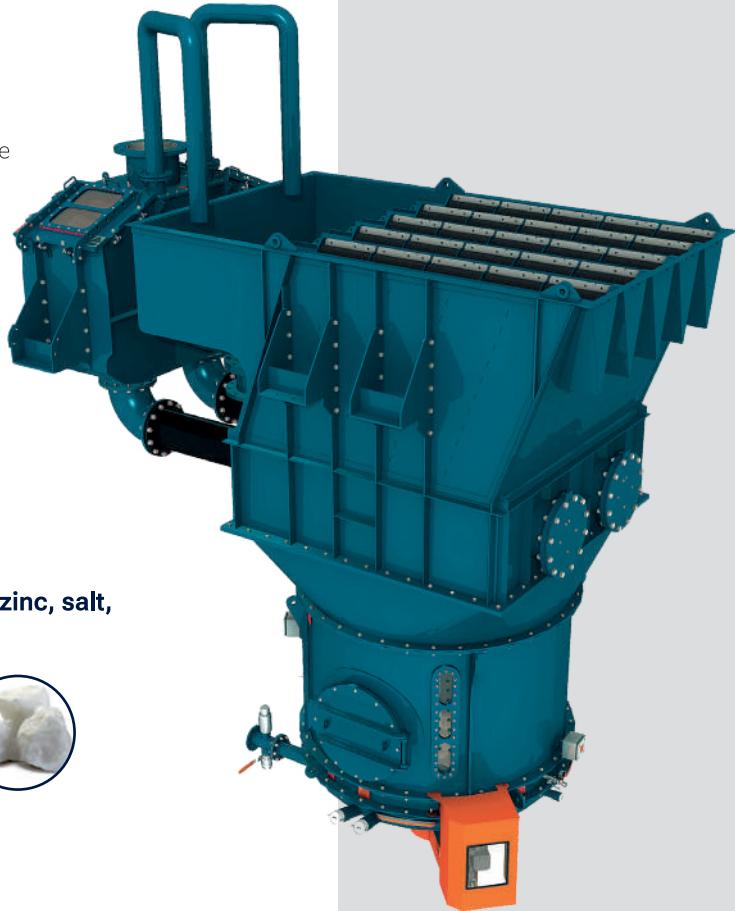
TIMAX separator is the most modern unit for gravity separation of fine particles, providing significant advantages in terms of performance and recovery of the valuable component. TIMAX allows you to significantly increase the capacity of the factory by recovering thin material using previously unknown methods. It requires a smaller footprint during installation, which makes it possible to install it in limited space conditions in existing factories.

TIMAX separator uses a minimum amount of energy and water to efficiently recover waste material.

Coarse slurry enrichment

0.25 to 2 mm

TIMAX separators are used for enriching coal, iron, gold, zinc, salt, and other minerals.



Capacity

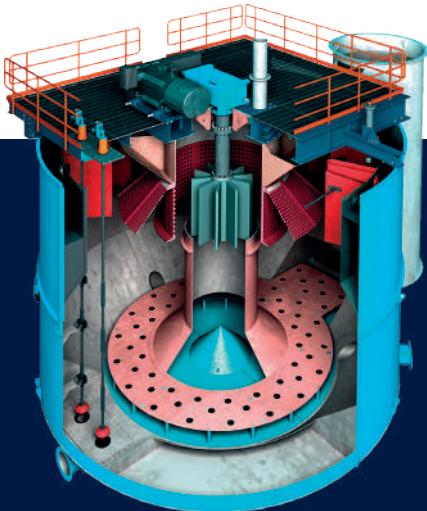
Model	Designed maximum capacity (tonnes per hour t/h)	Model	Designed maximum capacity (tonnes per hour t/h)
Timax 850	~ 36	Timax 2000	~ 168
Timax 1100	~ 56	Timax 2350	~ 233
Timax 1400	~ 95	Timax 3000	~ 376
Timax 1750	~ 134	Timax 3600	~ 551

Advantages

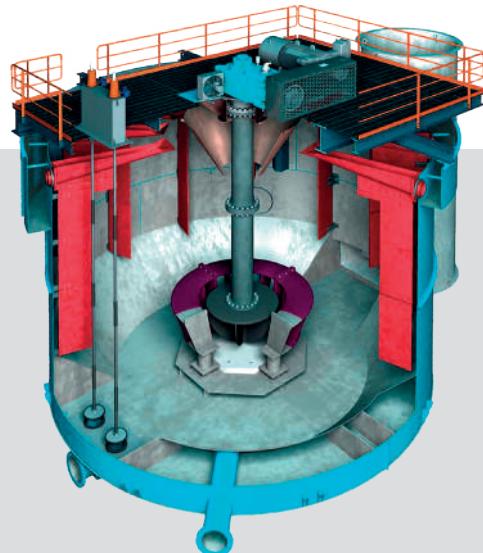
Material separation by density of 1.350 g/cm ³ 1	High performance up to 360 t/h 2	Efficient material recovery: increased yield 3	Runs on process (circulating) water 4
No silting (sandoff) effect 5	Ease of operation with a single control unit 6	High quality! Operational reliability of up to 97% 7	

TIM FLOTATION MACHINES

High performance of TIM flotation machines is achieved through well-thought-out internal hydrodynamics, which ensures utilisation of a larger usable cell volume for active flotation. This, in turn, increases the particle residence time and facilitates the removal of foam. TIM flotation machines allow you to obtain results with increased recovery and valuable component content when recovering both large and fine particles.



Mechanical flotation machine. The mechanism is an analogue of Wemco 1+1 mechanism (rotor in the upper part of the cell).
Self-aeration (no forced air supply required)



Mechanical-air machine. Dorr-Oliver analogue mechanism (rotor at the bottom of the cell)

We offer you a complete package to deal with flotation issues, from reliable and efficient equipment to complex process flow diagrams, equipment inspections, and sample testing.

TIM flotation machines are updated models, and their design includes cylindrical or square cells with pulp self-aeration technology. They are widely used at coal preparation plants.

The impeller in mechanical-air flotation machines rotates at the speed necessary only to keep the mineral particles in suspension and to ensure fine air dispersion. The air itself is supplied into the machine from the blower. This type is used in the gold, copper, iron ore, and sulphur enrichment.

Our company's professionals will design flotation machines with a cell from 10 to 300 m³ for your goals and objectives.

Advantages

Lower costs due to lower reagent consumption and longer machine life

1

Adequate solid particle residence time for high recovery and high quality of the concentrate

2

Individual control of each cell

5

Start after stop at load

6

Highest reliability level, maintenance cut to a minimum

3

Efficient handling of particles of different sizes

4

Design that prevents clogging

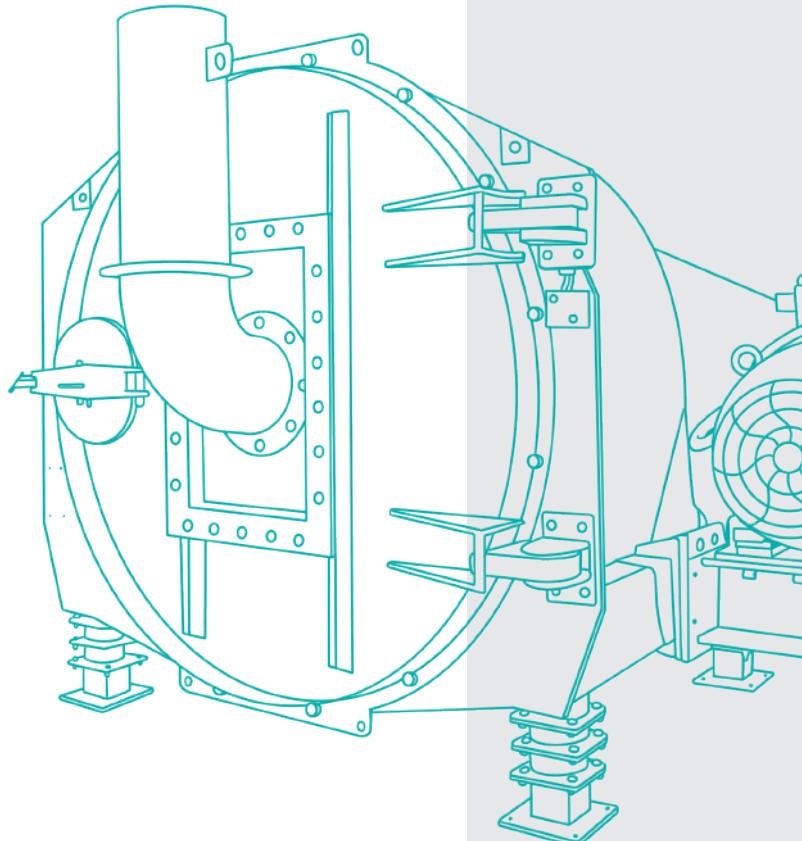
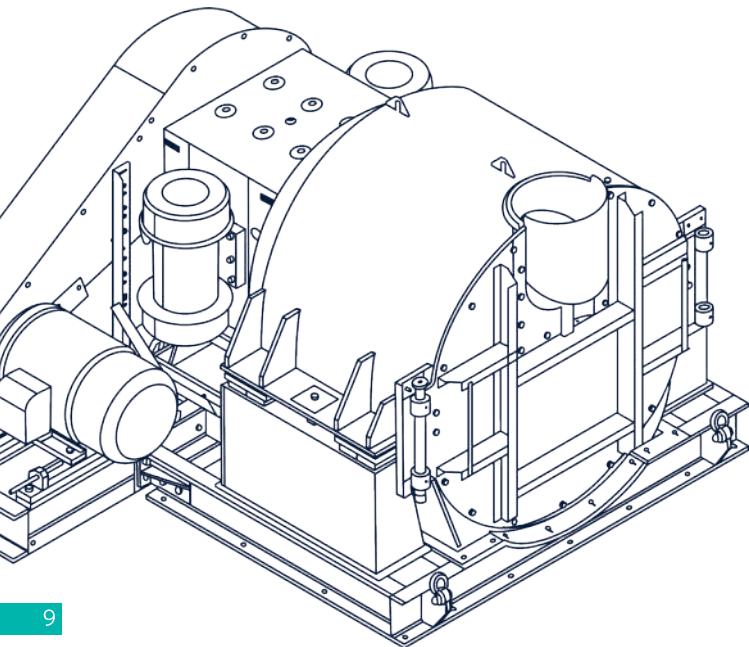
7

After the lower part is worn out, you may turn the rotor over and reinstall it

8

TIM CENTRIFUGES

The range of centrifuges supplied by our company is second to none in performance and reliability. This range includes coarse and fine coal centrifuges, featuring high performance, high technological effectiveness, durability, economy, and efficiency.



Oscillating centrifuges

(for coarse coal from 1 to 50 mm (80 mm))

	TIM 1100	TIM 1400	TIM 1650
Designed capacity (t/h)	150	300	410
Basket diameter (mm)	1100	1400	1650
Main drive motor (kV)	30	45	75
Vibrator motors (2x) (kV)	3.0	3.0	5.5
Oil filter motor	0.75	0.75	0.75
Centrifuge weight (t)	7.0	8.2	13.5

Scroll centrifuges

(for fine coal from 250 µm to 2 mm)

	TIM 1300	TIM 900
Designed capacity (t/h)	75 - 100	50 - 60
Drive motor (kV)	110	55/75
Lubrication system motor (kV)	0.75	0.75
Weight (kg)	6280	3600

TIM 1200 vertical centrifuge

(for coal grade from 250 µm to 2 mm)

Designed capacity (t/h)	Basket diameter (mm)	Drive motor (kV)	Oil pump (kV)	Weight (kg)	Material size (mm)
50 - 70	1200	55	1.1	5860	-6+0.25

TIM BELT FILTER PRESS

Belt thickeners and filter presses are electromechanical equipment designed for thickening and mechanical dehydration of industrial and domestic wastewater, including slurry and suspensions generated at food, pulp and paper, leather, metallurgical, and other plants.

The principle of operation of the belt filter press is that the sludge mixed with the flocculant is fed onto the moving sieve belt of the filter press and distributed over its entire effective width. The sludge is fed into the wedge-shaped pre-pressure zone where the filter press belts converge. The cake formed in the pre-pressure zone passes through the roller system, where it is subjected to maximum pressure. Due to special geometry of the shaft arrangement, surface pressure forces impact the cake. Next, the dehydrated sludge is cut off from the belts by special polymer knives. After the filter cake is removed, the filter press belts are washed with process water.





Advantages

Low construction height

1

S-roller vertical configuration

2

No cake rewetting

3

Bilateral filtration

4

Belt tension mechanism

5

Low operating costs

6

Capacity

5 to 40 t/h

depending on belt width

Belt width

up to 3 metres



TIM RADIAL THICKENER

Application

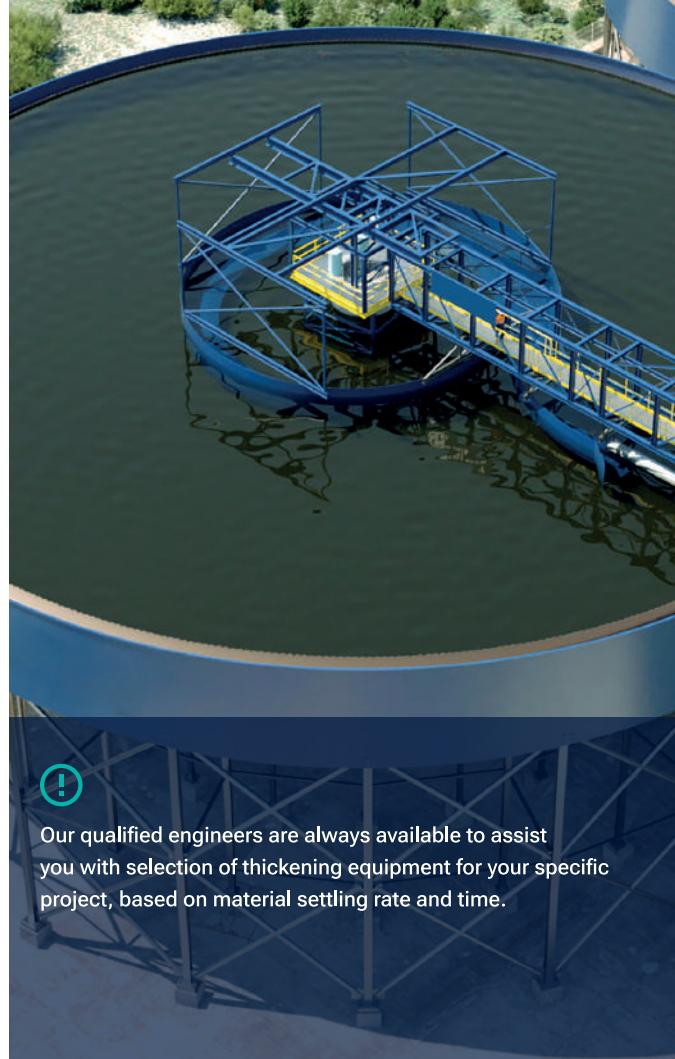
The radial thickener is used for thickening watered products of processing of mining and processing plants, as well as to thicken and clean liquids from solid particles in the coal industry, chemical industry, building materials, utilities, etc.

Principle of operation

Upon getting inside the casing of the radial thickener, the pulp mixes with the flocculant solution, goes down and spreads from the centre to the annular drain trough. At the same time, the solid particles contained in the pulp settle to the bottom of the thickener, and the clarified water overflows through the edges of the annular drain trough for drainage.

Thickening mechanism

The thickening mechanism is supported by a bearing structure made in the form of beams or truss frames. The drive rotates the tine arms through the central shaft. It has an automatic lifting system. The condensed product is unloaded through a cone located in the central part. Our radial thickener drives are manufactured in a world-class factory and are the most reliable ones at present.



Our qualified engineers are always available to assist you with selection of thickening equipment for your specific project, based on material settling rate and time.



The right choice of thickener or clarifier size provides the system with a margin of safety against possible process failures, as well as additional operational flexibility.

Advantages

Minimised flocculant consumption

1

Uniform distribution of solid particles

2

Increased settling rate

3

Stable density characteristics of the condensed product

4

Our company produces radial thickeners

of up to 80 meters in diameter

TIM LAMELLAR THICKENERS ENSURE:

- 1** Significant reduction in the occupied production area
- 2** Ability to integrate into any system
- 3** Energy saving
- 4** Facilitated process monitoring
- 5** The equipment is delivered in the form of separate elements or as an assembly



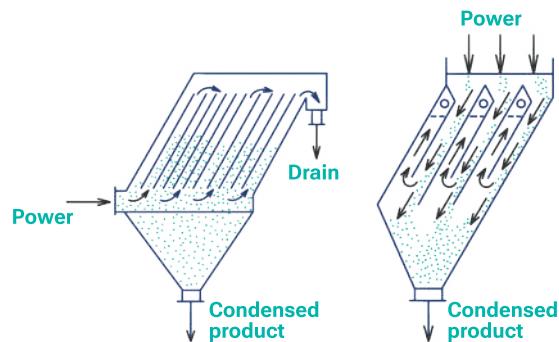


A lamellar thickener has a smaller footprint compared to a radial thickener

Lamellar thickeners combine the simplicity of gravity settling with the principles of inclined plate settling. Dynamic separation of materials is achieved through a unique downflow pattern. Inclined plate settling elements are stacked on top of one another and serve to separate liquid from solid particles.

Principle of operation

Power enters the top of the stack of elements and passes down between them. A small amount of flow enters each of the elements where the clear liquid is collected at the top and transported horizontally and then upwards to the effluent collection trough. Solid particles continuously move down under the influence of gravity and increase their density as they pass through each element. This way high drain purity and maximum density of the condensed product at unloading are achieved.



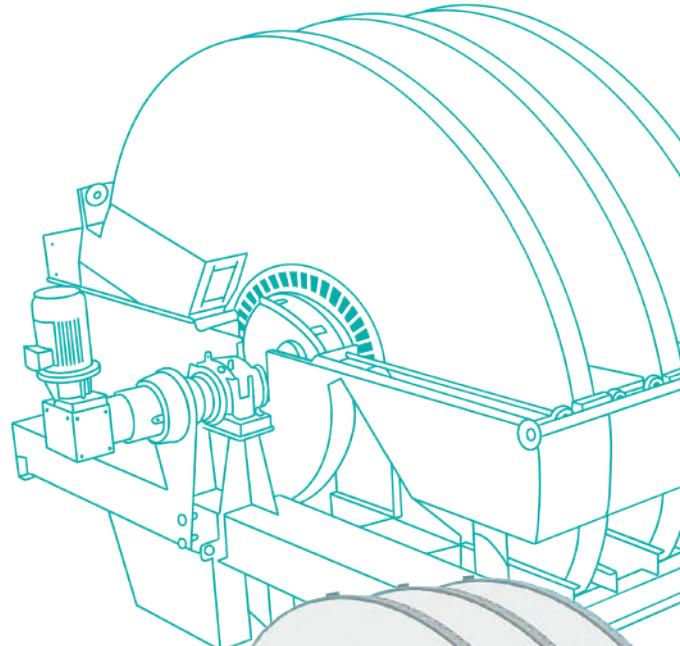
TIM DISC VACUUM FILTER

Application

Disc vacuum filter is a widely used type of industrial filter equipment used for filtration of pulps and slurries and for wastewater treatment.

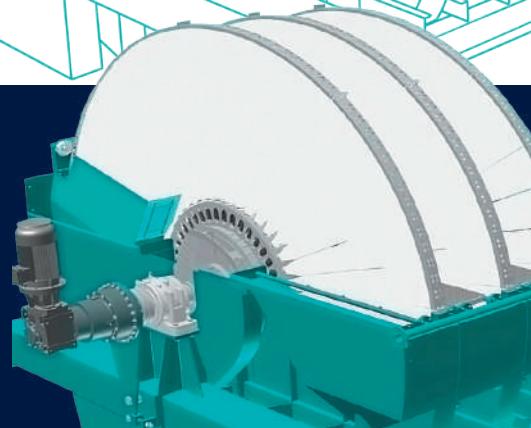
Filtration principle

The pulp is fed into the filter bath. The solid phase lingers on the surface of the partition plate under the action of vacuum. The filtrate enters through filter cloth (mesh) into the sector cavity, and then it is removed from the filter through the shaft channels. The remaining free liquid is removed in the drying zone and removed from the filter. In the removal zone, compressed air is supplied inside the sections to separate the sediment from the filter partition and to remove it with a knife. The sludge is blown by an impulse, using a blowdown valve.



Equipment mechanism

A disc vacuum filter consists of a horizontally located rotating shaft with discs mounted thereon. Each vacuum filter disc consists of 12–18 separated hollow sectors whose drainage surface is covered with filter cloth or mesh. The cavity of each disc sector communicates with the corresponding shaft channel (cell).



Disc diameter, m

1.2 to 3.8

Filtration surface area, m²

12 to 286

Capacity, kg/h/m²

290 to 340

Advantages

Multi-disc design with a large disc diameter

1

Innovative design with high hydraulic efficiency

2

Maximum filtration capacity per footprint

3

Modular design with the possibility of expansion

4

Heavy-duty agitators available

5

Advanced flushing and cleaning solutions

6

TIM CHAMBER FILTER PRESS

Application

TIM chamber filter press is a high-tech batch-type equipment to separate under pressure liquid heterogeneous systems (suspensions, pulps) into a liquid phase (filtrate) and a solid phase (sediment, cake). They are especially widely used at mining and processing enterprises **in the metallurgical, coal, chemical, and other industries.**

Principle of operation

TIM chamber press filters consist of two main components: a frame and a stack of plates. Filtration is achieved by squeezing the plates together and pumping the suspension under pressure into the cavities formed between the closed plates. The filter material fills the chambers and retains solid particles, while allowing clarified liquid to pass through. When the plates are unclenched and shifted, the cake falls out of the cavities, and the filter is ready for repetitive operation.



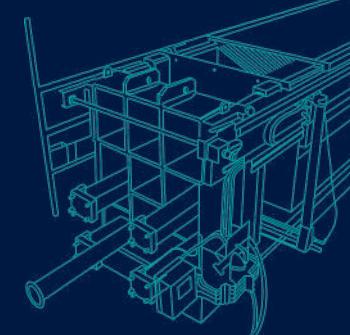


Advantages

Easy operation and maintenance 1	Safe air-operated or electrical control 2	Minimum weight and space requirements 3
Maximum area and volume 4	Flexibility in design 5	High corrosion resistance 6

Sizes and performance

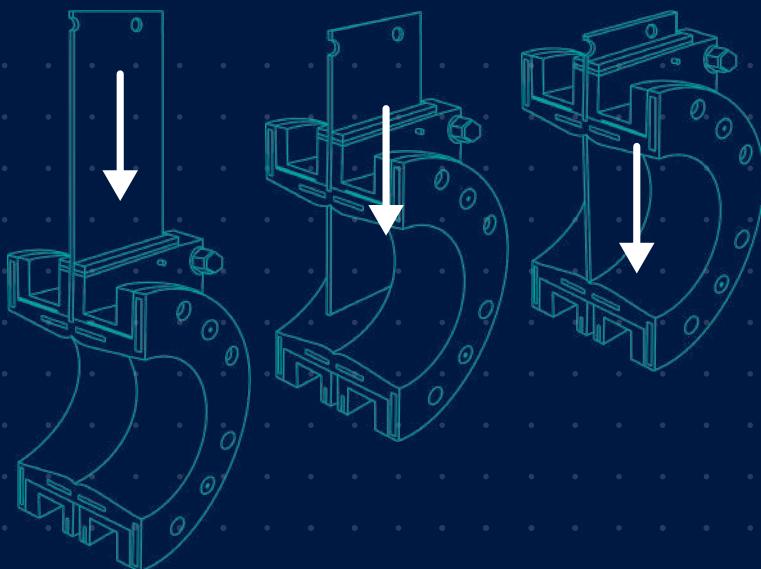
Designation	Plate size (mm)	*Volume of chambers (m ³)	*Filtration area (m ²)
M470	470x470	0.004	0.32
M630	630x630	0.027	0.59
M800	800x800	0.046	0.98
M900	900x900	0.017	1.2
M1000	1000x1000	0.02	1.6
M1200	1200x1200	0.04	2.5
M1500	1500x1500	0.06	3.8
M2000	2000x2000	0.08	6.7



* These are nominal filtration areas and volumes. They can range depending on the selected cake thickness and final specifications of inserts for specific application

TIM KNIFE VALVES

Reliable operation under the toughest conditions on abrasive slurries.
Unbeatable performance and service life. Those who say it is impossible to
get all that are unfamiliar with our high-quality valves.



Size range

50 to 1200 mm

Nominal pressure

up to 10 bar

Housing material

High-strength cast iron

Gate material

Stainless steel

Advantages

- Every model provides improved safety performance
- Proven material quality and reliability
- Reduced downtime and accelerated maintenance
- Reduction of number of spare parts in stock through interchangeable components
- The basic configuration of all valves includes high-quality materials



For piping valves control, P&M company offers several types of drives:



Electric



Manual



Pneumatic



Cone gear



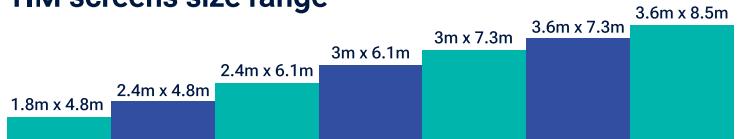
Hydraulic

TIM SCREENS

! These screens are highly reliable heavy-duty equipment for mining industry

These screens have a wide range of sizes **from 0.9 to 4.8 m widthwise and up to 11.0 m lengthwise**. Horizontal, multi-slope ("Banana"), and inclined single-deck, two-deck, and three-deck configurations of screens are available.

TIM screens size range



They are ideal for:

- Deslurrying
- Waste and product draining and flushing
- Dehydrating
- Detrashing
- Coarse fractions screening
- Sorting
- Classifying bulk materials
- First, second, third, and fourth crushing stages
- Grinding cycles
- Recirculation
- Carbon regeneration



Easy maintenance

Computer aided modelling of all principal components simplifies selection of spare parts. A global chain of spare parts supply and maintenance services is available.

Strength and reliability

Assembly fully based on huck bolts. All basic blocks are connected by continuous corner welds, with residual stresses removed on all critical structural components. A comprehensive quality assurance and control system meets the top global standards.

Advantages

A wide range of sizes—
up to 4.8 m widthwise
and up to 11.0 m
lengthwise

1

Dynamic stress up to
5.0 G ensures high
screening efficiency

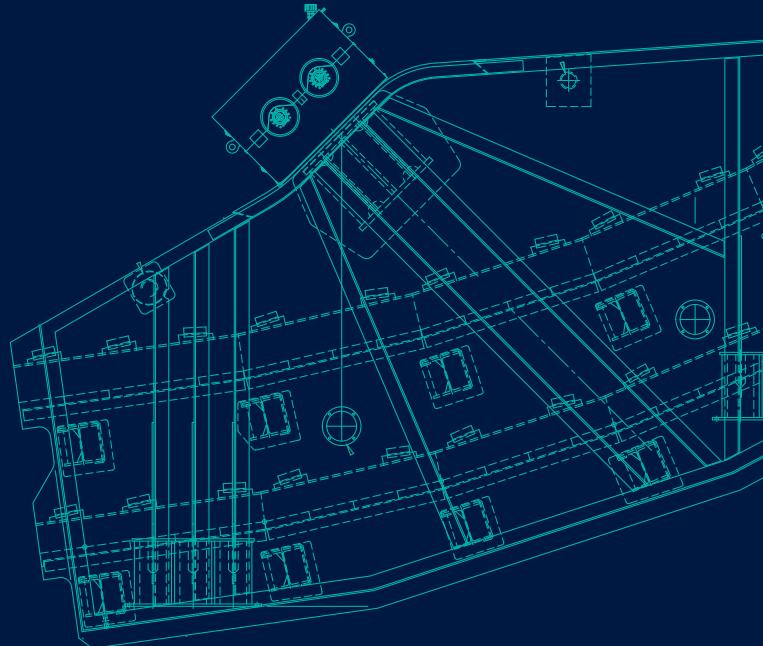
2

Single-deck, two-deck,
and three-deck
configurations are
available

3

Floor mounting on
galvanised steel coil
springs provides
vibrating insulation
of up to 98%

4



CONVEYOR EQUIPMENT

Thanks to the wide experience of the company coupled with the software for dynamic analysis, horizontal and vertical curves analysis, better track tension and conveyor roller support load performance, our engineers can successfully design and build belt-type conveyors, which used to be an unattainable goal a few years ago. Using the improved modelling techniques, we can predict the spatial movement and interaction of solid particles. Mathematical equations take into account the form, position, binding capacity, velocity, and force of every particle and allow modelling their movement when they pass through the pre-determined space for developing new solutions and minimising the problems in movement of the material flow through reloading points.



TRUNK CONVEYORS

The company has succeeded in designing of ground based trunk conveyors with horizontal and vertical curved sections. Engineers are pioneers of the industry thanks to the use of state-of-the-art technologies in a variety of critical applications and under the hardest conditions.



PORTABLE CONVEYORS

Portable conveyors (with a hoist handling facility) consist of conveying components, a tyre or track-type framed structure in the front portion, and a skid steel structure in the conveyor tail. The stacker is usually fed by a chain of portable conveyors. As stacking moves on, portable conveyors are put into or out of the chain.

TUBULAR CONVEYORS

A tubular conveyor allows for seamless integration in the existing plants and ensures reliable long distance transportation, especially under severe topographic conditions, as well as protection of the material being transported and environmental protection. Thanks to its special design, the conveyor can transfer all types of bulk materials.



TIM CLASSIFYING HYDROCYCLONE

A static apparatus for centrifugal classification of fine feed pulp size.

Sizes of hydrocyclone plant	Range of heads		Possible configuration of lining	Conicity, degrees
	Discharge, mm	Sand, mm		
40 OT	6–16	2–8	P, R	6
100 OT	25–40	10–30	P, R	6
150 OT	35–60	10–50	P, R, C	6, 10
250 OT	60–100	30–70	P, R, C	6, 10, 20
400 OT	100–150	50–110	R, C	10, 20
500 OT	140–220	60–140	R, C	10, 18
650 OT	210–360	130–200	R, C	10, 18
800 OT	320–440	170–300	R, C	18

P is polyurethane, R is wear-resistant rubber, C is ceramics

Advantages

- Wide size range
- Enhanced throughput capability
- Classification and finished size recovery efficiency
- Extended service life
- Reduction of operating maintenance costs



TIM HEAVY MEDIUM HYDROCYCLONE

Designed for fine size coal enrichment or classification

Sizes of hydrocyclone plant	Range of heads		Possible configuration of lining
	Discharge, mm	Sand, mm	
250 OT	100, 110	70, 80, 90	C, SC
400 OT	160, 200	120–160	C, SC
500 OT	200, 250	150–200	C, SC
650 OT	250–320	190–260	C, SC
800 OT	320–400	240–320	C, SC
1000 OT	400–500	300–400	C, SC
1150 OT	450–570	340–460	C, SC

C is AL203 ceramic tile, SC is silicon carbide

Advantages

- Enhanced throughput capability
- Enrichment and recovery efficiency
- Extended service life
- Reduction of operating maintenance costs



TIM CONE AND GYRATORY CRUSHERS

High-quality and durable cone and gyratory crushers excel in their leading-edge design that provides for easy and safe maintenance and repair. They are engineered in such a way so as to allow for easy access and removal of the eccentric unit, bushings, and hydraulic piston through the top of the crusher.

Advantages

The design of the 4 bolt yoke cuts the time required for removal

1

The spiral conical gearbox allows for increase of crushers' installed power

2

Intermediary shaft unit can rotate for fine adjustment of gears engagement during installation

3

Threadless design of the main shaft enhances strength through minimising the peak loads

4

Design of the upper cover wear-resistant inserts allows for their easy replacement

5

Air-tight dust-proof seal minimises ingress of particles and protects oil from contamination

6

Casing inspection holes allow the service personnel to inspect and check wear of the crusher casing liners

7





TIM JAW CRUSHER

An active feeding hole and the crusher jaw slope angle allow for feeding off-gauge and very hard ores to the crushing chamber. This exclusive design surpasses other conventional and modular designs in strength and reliability. Bearings rest on large diameter pins made of large diameter forged alloyed steel. Bearings are lubricated with grease and protected from dirt with a multi-pass labyrinth.

- Modular-type frame with bolt and pin connections
- Steep gripping angle for crushing large-size and hard ore
- Reverse lining of the opening work surface
- Low-maintenance design

Model	75 mm (3 d)	100 mm (4 d)	125 mm (5 d)	150 mm (6 d)	175 mm (7 d)	200 mm (8 d)	225 mm (9 d)	250 mm (10 d)	275 mm (11 d)	300 mm (12 d)
FJ1100	150-210 (165-230)	180-275 (200-300)	225-345 (245-380)	300-420 (330-460)	320-505 (350-555)	380-610 (420-670)				
FJ1200		220-315 (240-345)	275-390 (300-430)	350-460 (385-507)	380-570 (420-630)	445-670 (490-740)	505-775 (555-855)			
FJ1400			350-435 (385-480)	395-515 (435-565)	435-605 (480-665)	490-700 (540-770)	555-800 (610-880)	595-905 (655-1000)		
FJ1550				420-590 (460-650)	485-690 (535-760)	550-800 (605-880)	620-900 (688-990)	680-1030 (750-1135)	730-1160 (805-1280)	805-1300 (885-1435)



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