



Screening and Processing



Drying System



Wood Yard



Conveying solutions in the
cement industry



Maintenance and
Service



Waste to Fuel



Waste to Flame



Waste to Electricity



Biomass Fuel Handling



Pneumatic Conveying

INDUSTRIAL PROJECT AND SERVICE

www.ispm-service.com



ISPM-Service is a portuguese company born in 2015 with an environmental and innovative concept, guided by values that encourage sustainable development in an industrialized Era, where the generation of energy from waste is not only a way to ensure the future of the planet, but also a mean to profit. ISPM is a flexible, enthusiastic, socially responsible organization and adaptable to the changes. Our business is characterized mainly for a joint effort with our business partners. Together we design, produce, and assemble equipment and turn-key projects in various areas. Our technical assistants are motivated and highly qualified professionals. Overcoming challenges and searching for the generation and implementation of technological, innovative, and out-of-the-box business solutions, are on our day-to-day basis and part of our longterm vision for **ISPM-Service**. We are a visionary company, we work today for tomorrow as the beginning of the future.

**THE FUTURE'S
SOLUTION
TODAY**

Paulo Teixeira

ISPM has been named Official Reseller Of:

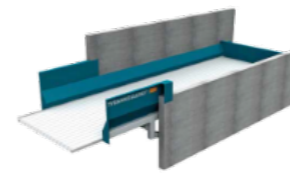
*BMH Technology in Portugal and France;
Jeffrey Rader, Stela and Aumund in Portugal;
Demuth in Portugal, Spain and France.*





Waste to Fuel

TYRANNOSAURUS® Waste to Fuel solution turns waste to profit with high availability and low production costs.



TYRANNOSAURUS® Feeders

TYRANNOSAURUS® Feeders enable optimal feeding to the shredder/crusher ensuring continuous maximum capacity.



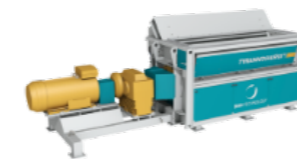
TYRANNOSAURUS® 9900 Main Shredders

TYRANNOSAURUS® 9900 main shredders are the World's biggest and strongest waste shredders.



TYRANNOSAURUS® 1500 Fines Screens

TYRANNOSAURUS® Fines Screen separates fines, for example, sand, glass, soil from the material.



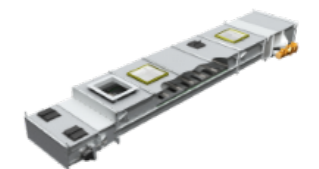
TYRANNOSAURUS® 1200 Fine Shredders

TYRANNOSAURUS® Fine Shredders are used to ensure the combustibility of the fuel by reducing the particle size as small as 25 mm.



Screw conveyor

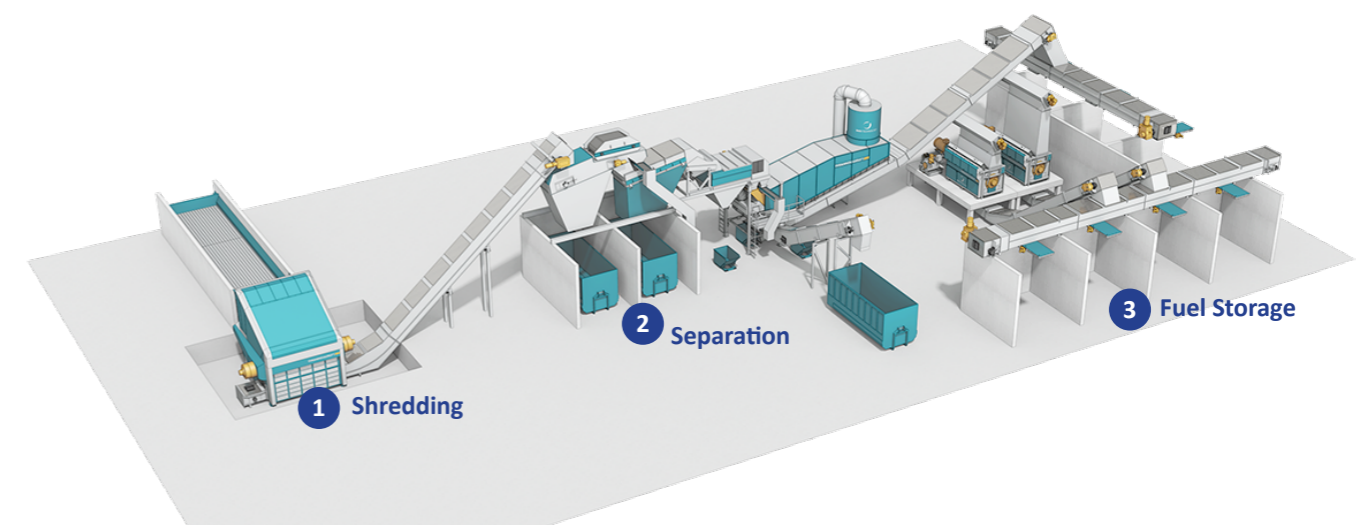
Screw Conveyors are economical ways to transfer bulk materials over short distances.



Drag Chain Conveyors

Drag Chain Conveyors are ideal for safe and reliable transportation of bulky materials in various industrial processes.

All equipment operate together intelligently by high level of automation to optimize production capacity and fuel quality. All Waste to Fuel solutions of BMH Technology are customized according to the infeed material and specified fuel quality.



Some see
a problem,
others see an
opportunity.

DO YOU WANT TO TURN WASTE TO FUEL AND PROFIT?

The best way to do that is to get a complete TYRANNOSAURUS® plant from BMH Technology. You will get the strongest and smartest waste-to-fuel system there is, delivered turnkey in a compact layout. The Tyrannosaurus System gives you the best SRF* in the world. And lots of it. Just one production line will process as much as 1200 tonnes of MSW (Municipal Solid Waste) or 600 tonnes of industrial waste or car tyres per day.

And not only that: Tyrannosaurus will achieve this with high availability, low production cost, low maintenance cost and no constant surveillance.

* SRF

Solid Recovered Fuel by mandate of the European commission: CEN/TC343.

The calorific value of standard SRF is almost the same as that of coal (15-20 MJ/kg compared to approximately 25 MJ/kg), but the fossil carbon dioxide emissions are almost five times less. SRF has only very little chlorine or sulphur. Furthermore, SRF is a local fuel, coming from inexhaustible raw material sources. Its usage will contribute to solving important issues of waste management. Not only is SRF the cheapest fuel available, but its application can also enable you to benefit from the freed marketable CO₂ credits.

TYRANNOSAURUS® System

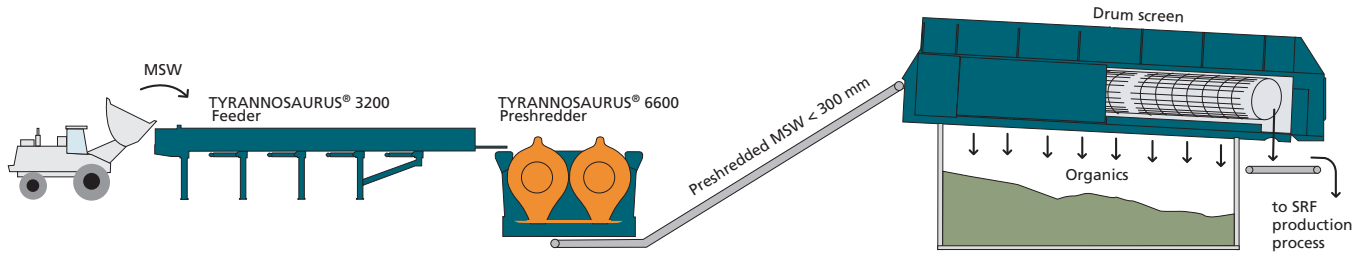
The process starts with the raw material in the feeder. Tyrannosaurus Feeder is automatized to work optimally together with the shredder. If the shredder has a big mouthful to chew, the feeder slows down, allowing the production line always to work at maximum capacity.

Tyrannosaurus Shredder is simply the biggest, strongest and smartest shredder in the world. He weighs up to 90 tonnes, is made of a 60 mm solid steel frame and never stops working. Not only is he robust, but he is intelligent, too: MIPS® (Massive

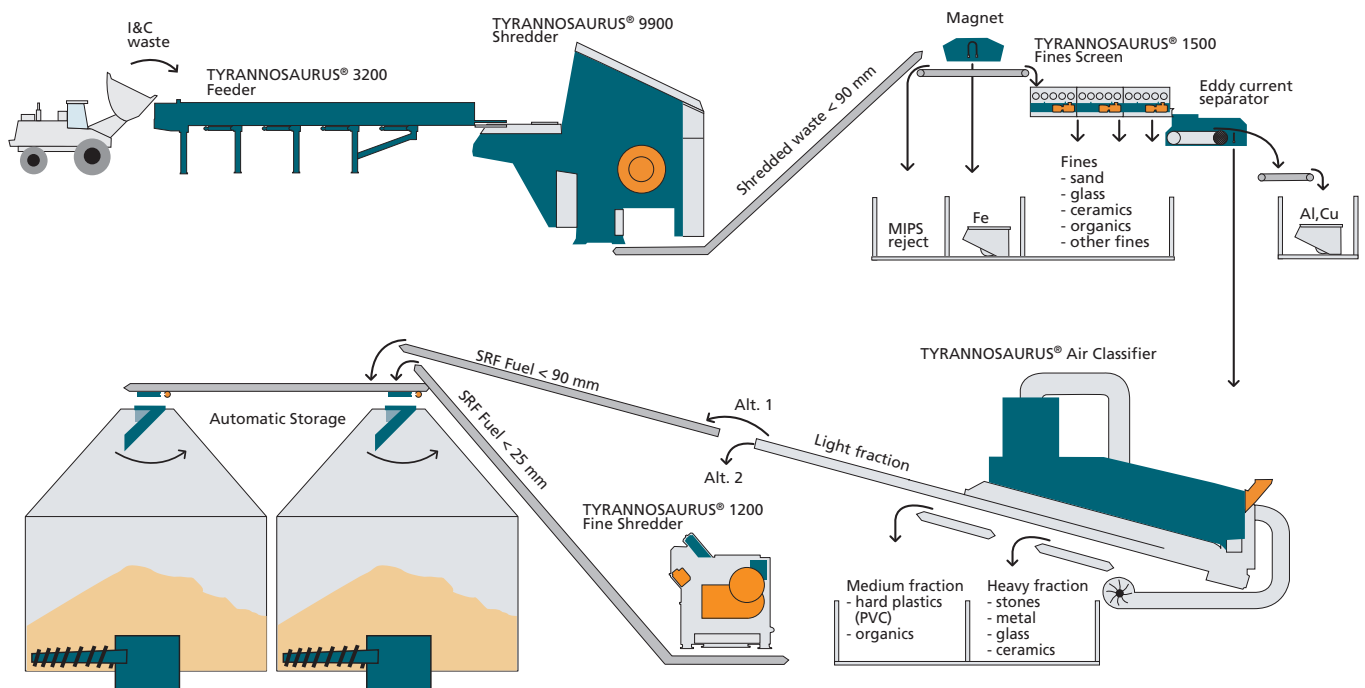
Impact Protection System) means that he will spit out bigger pieces of metal that cannot be crushed and keep on shredding. And shred he will. At maximum capacity, he can reduce particle size to 75 mm in one single stage. ZeroGap® shredding means that particle size and quality are maintained even with the wear of knives. The knives are hydraulically adjustable to keep on working optimally and to lengthen the service interval.

After ferrous metals have been separated by belt magnets, Tyrannosaurus Fines Screen separates

TYRANNOSAURUS® MSW Pretreatment Process



TYRANNOSAURUS® SRF Production Process



sand, glass, soil, organics and other small heavy and wet particles. This is followed by separating conductive metals by eddy current separators.

The final touch is given by Tyrannosaurus Air Classifier. This is the decisive stage concerning the quality of the fuel. In the Tyrannosaurus System, you can adjust the process online, allowing you to make the optimal fuel for the end user, for example cement kiln or power plant. Should smaller particle sizes (20 – 25 mm) be needed, Tyrannosaurus Fine Shredders – the biggest in the world – can be added to the production line.

Pretreatment Process

Not all waste is equal though, nor all combustion processes. Should the quantities of wet organics in the raw material be high, as usually is the case with MSW, they should be separated before the actual SRF production. The Tyrannosaurus MSW Pretreatment Process starts with a receiving feeder which works as a buffer to feed the Preshredder. Tyrannosaurus Preshredder will produce about 250 mm particle size, which is then refined in the SRF process. For grate-fired incinerators, this particle size would be acceptable

as such, in which case the Preshredder could be the main shredder. The wet organics and non-recyclable materials are separated by a drum screen or a disc screen and fractions with higher calorific value are conveyed further to the Tyrannosaurus SRF Production Process.



SIMPLY SUPERIOR

In the Tyrannosaurus System, every step of the shredding and separating process is the result of long experience in process industry engineering and heavy-duty machine design. We at BMH have set the new standard for SRF production.

What does the TYRANNOSAURUS® System give you?

- turnkey delivery
- high availability
- high capacity
- minimum maintenance
- no constant surveillance
- automated process
- compact layout
- low production cost
- the best fuel quality

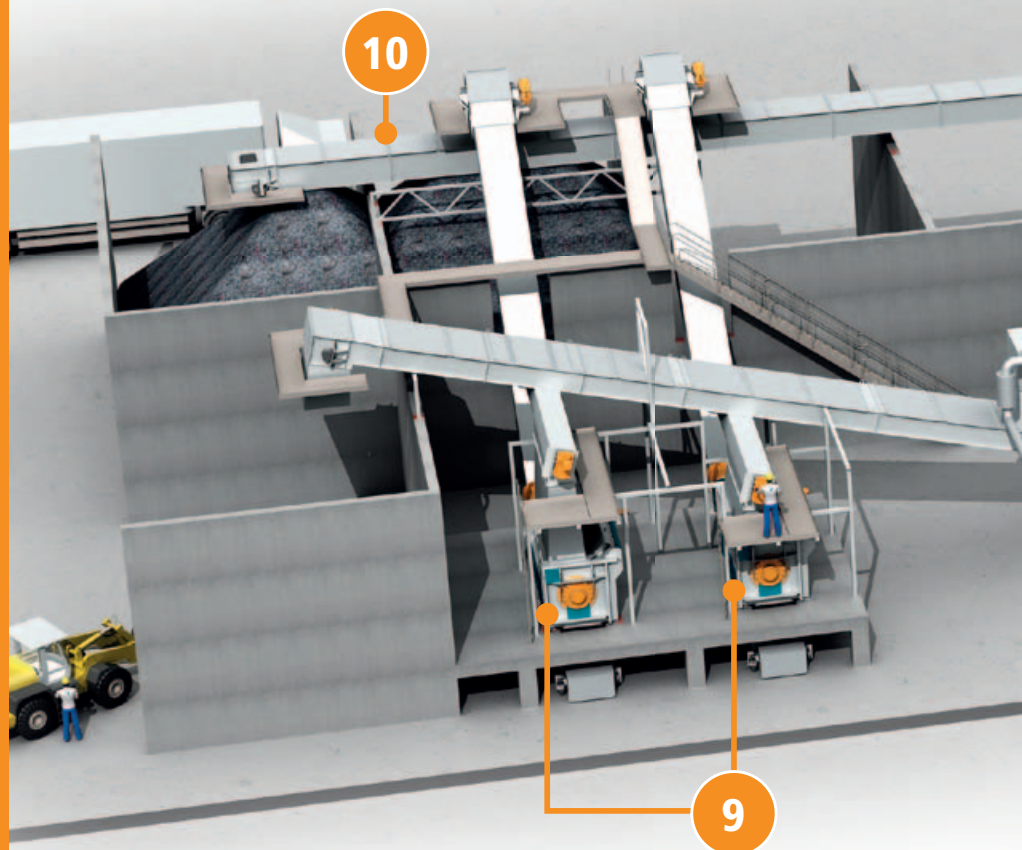
Taking care of your investment

The Tyrannosaurus System is the best in the world. Even the best is exposed to wear, but less than others, because BMH has a comprehensive knowledge of the process as a whole. Regular control, inspection and preventive maintenance guarantee the high availability of your production.

The fuel quality stays maximised, impurities minimised and you are in complete charge. Who better to take care of your investment than the people who designed it?

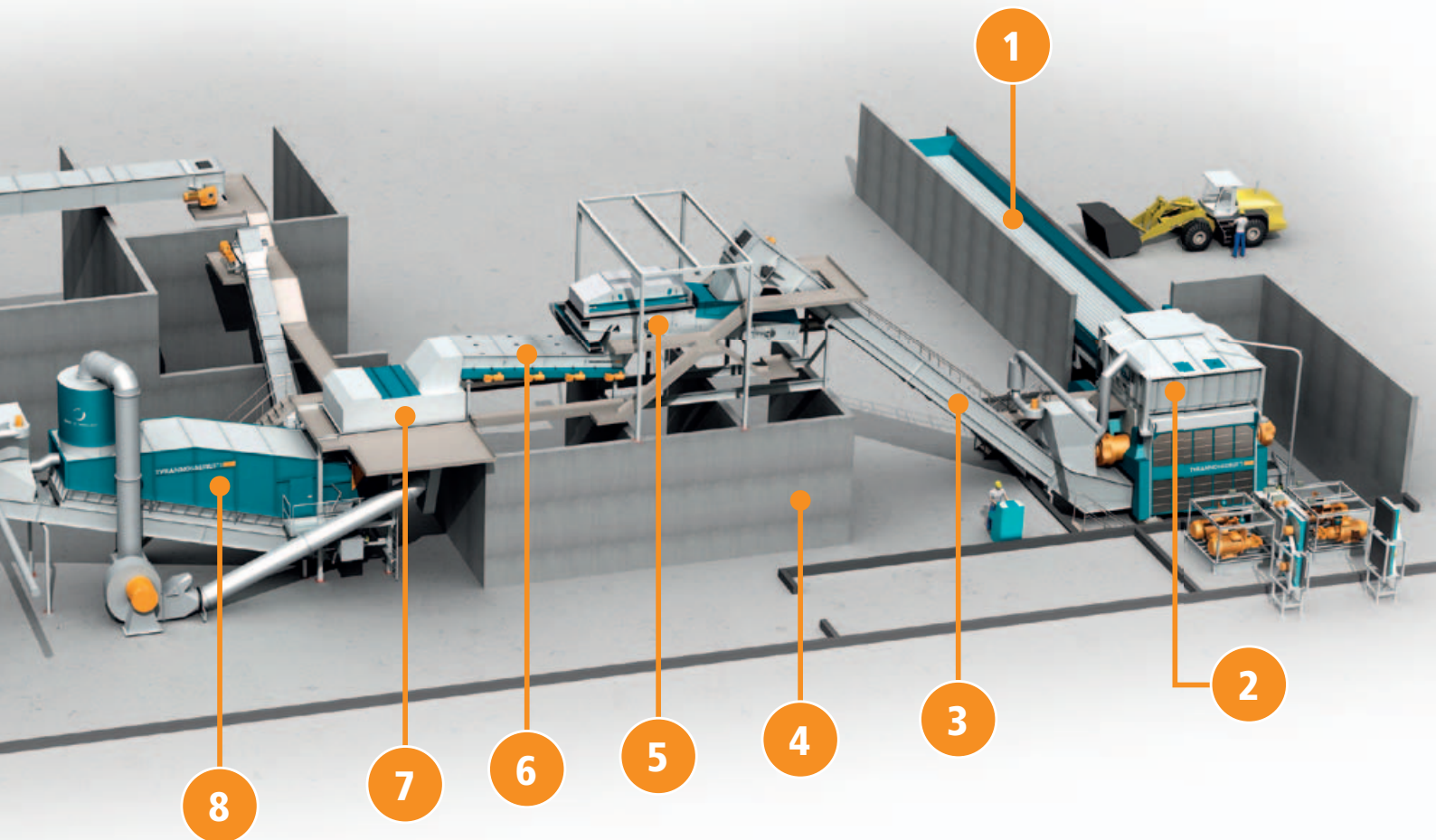
Availability is king

BMH Service crowns your waste-to-energy process



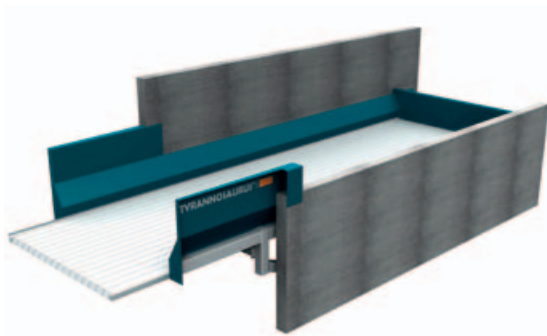
TYRANNOSAURUS® SRF Production Plant

1. TYRANNOSAURUS® 3200 Feeder
2. TYRANNOSAURUS® 9900 Shredder
3. Discharge Conveyor
4. Automatic Tramp Metal Rejection (by MIPS®)
5. Ferrous Metals Separation
6. TYRANNOSAURUS® 1500 Fines Screen
7. Non-ferrous Metals Separation
8. TYRANNOSAURUS® Air Classifier
9. TYRANNOSAURUS® 1200 Fine Shredder
10. Storage System



TYRANNOSAURUS® Family

TYRANNOSAURUS® 2400 & 3200 Feeders



- Fully automatic optimal feeding.
- Ensures maximal process capacity.
- Heavy-duty design.
- High reliability.
- Low operating and maintenance costs.

TYRANNOSAURUS®	2412 3212	2418 3218	2424 3224
Width m	2.4 3.2	2.4 3.2	2.4 3.2
Length m	12	18	24
Power kW	37 45	37 45	37 45
Power transmission	Hydraulic	Hydraulic	Hydraulic
Capacity tonne/h	75 100	75 100	75 100

TYRANNOSAURUS® 6600 Preshredders



- For rough shredding in the pretreatment process or as the main shredder for grate-fired incinerators.
- Produces 100 – 300 mm particle size.
- Hydraulic drive.
- Easy maintenance.
- Low operating and maintenance costs.

TYRANNOSAURUS®	6603	6604	6605
Rotor length mm	1900	2500	3200
Rotor diameter mm	660	660	660
Power kW	220	264	320
Power transmission	Hydraulic	Hydraulic	Hydraulic
Capacity tonne/h	20 – 50	40 – 70	50 – 90
Weight kg	11,000	12,000	13,000

TYRANNOSAURUS® 9900 Shredders



- The world's biggest and strongest waste shredder.
- Shreds any combustible material.
- Produces uniform particle size in one single phase.
- No primary and secondary shredding needed.
- Protected from tramp metal injuries by MIPS® (Massive Impact Protection System) with fully automatic rejection of unshreddable pieces.
- Easily adjustable counter-knife system.
- Low operating and maintenance costs.
- Due to ZeroGap® shredding, wear of knives has minimal impact.

TYRANNOSAURUS®	9903	9904	9905
Rotor length mm	2400	3200	4000
Rotor diameter mm	990	990	990
Power kW	365	525	685
Power transmission	Hydraulic	Hydraulic	Hydraulic
Capacity tonne/h	10 – 25	15 – 35	25 – 50
Weight kg	50,000	65,000	80,000

TYRANNOSAURUS® 7700 Shredders



- Compact and robust design.
- Shreds any combustible material.
- Produces uniform particle size in one single phase.
- Protected from tramp metal injuries by MIPS® (Massive Impact Protection System).
- Adjustable counter-knife system.
- Low operating and maintenance costs.

TYRANNOSAURUS®	7703	7704
Rotor length mm	2400	3200
Rotor diameter mm	770	770
Power kW	357	517
Power transmission	Hydraulic	Hydraulic
Capacity tonne/h	10 – 20	12 – 25
Weight kg	25,000	30,000

TYRANNOSAURUS® 1500 Fines Screens



- Separates sand, soil and other fines.
- Reduces the content of ash, humidity, chlorine and heavy metals.
- Rotating shafts with rubber stars.
- Adjustable throughput with speed and star gap.
- Low operating and maintenance costs.

TYRANNOSAURUS®	1501	1502	1503	1504
Width mm	1500	1500	1500	1500
Modules	1	2	3	4
Shafts	12	24	36	48
Capacity tonne/h	20	40	60	80

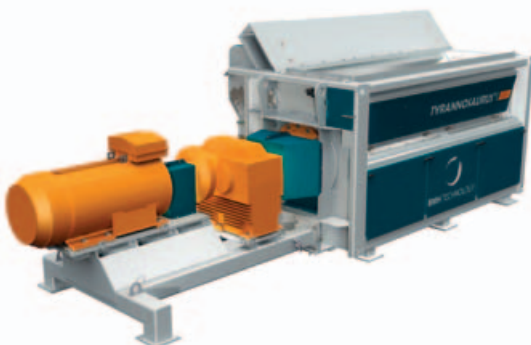
TYRANNOSAURUS® Air Classifiers



- Separates inert materials like glass, stones, ceramics, remaining metals and organics.
- Produces clean light fraction.
- Online adjustable.
- Low operating and maintenance costs.

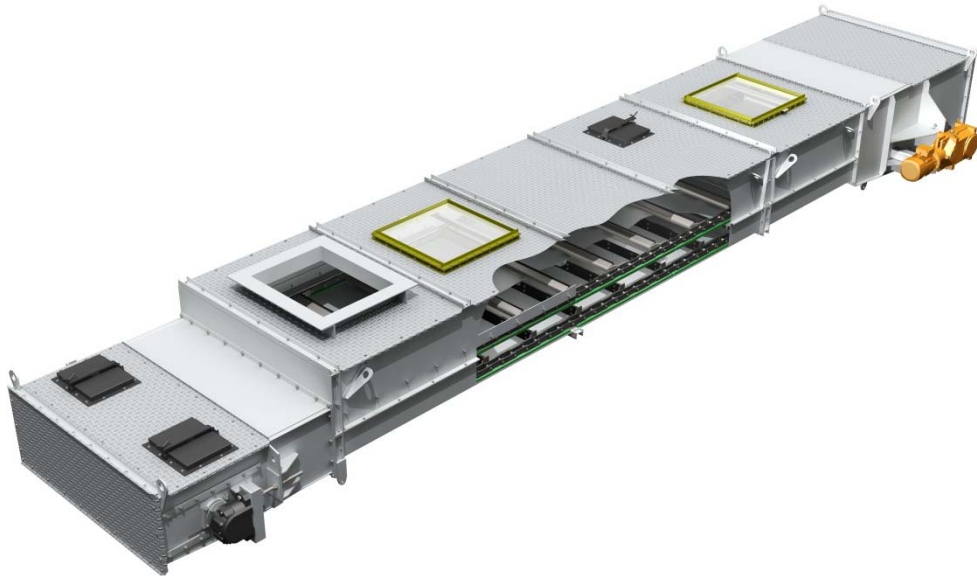
TYRANNOSAURUS®	1200	2500
Width mm	1200	2500
Power kW	44	90
Capacity tonne/h	25	60

TYRANNOSAURUS® 1200 Fine Shredders



- The biggest fine shredder in the world.
- Shredding from 80 mm to 25 mm fraction.
- Easy maintenance.
- Low operating and maintenance costs.

TYRANNOSAURUS®	1203	1204
Rotor length mm	2400	3200
Rotor diameter mm	1200	1200
Power kW	250	355
Power transmission	Gear box	Gear box
Capacity tonne/h	8 – 15	12 – 20
Weight kg	20,000	26,000



Drag chain conveyors provide a safe and reliable solution for handling powdery and dusty bulk materials in various industrial processes that require a continuous and even material flow.

Drag chain conveyors efficiently meet your needs in the following areas:

- receiving of material and transferring to intermediate storage
- filling of storage silos
- discharging from storage silos and further feeding to process equipment
- transferring of end product to storage

Width (mm)	Capacity (m ³ /h)	Recommended max. length (m)
650	150	60
800	200	60
1000	300	60
1200	400	60
1400	500	60
1600	700	60
2000	1000	60

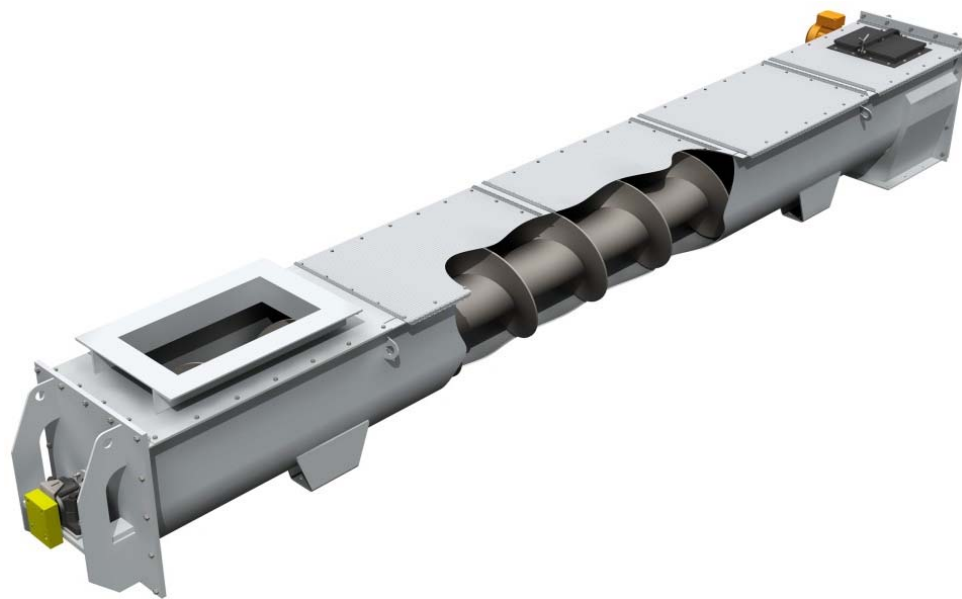
Please note that the values in this table are only indicative. The capacities have been calculated for handling woodchip or similar materials.

IDEAL FOR HANDLING:

- biomass fuels (woodchips, bark, peat, agro biomass, pellets)
- solid recovered fuel (SRF)
- coal
- ash
- cement
- lime and minerals

Main advantages

- customised solutions based on modular engineering for fast and cost-effective installation
- horizontal or inclined installations, or a combination of both
- several inlet and outlet points
- standard components and chain types
- forged chains for heavy-duty applications
- special chains for heavy-duty and demanding conditions (heatproof structures)
- possibility to include water-cooling designs
- simple construction for straightforward maintenance
- dust-tight and spillage-free



Screw conveyors are one of the most economical ways to transfer bulk materials over short distances.

Besides transferring materials from one place to another, screw conveyors can be used for:

- feeding, dosing and mixing
- distribution of material flow
- cooling (double-wall special design)
- humidifying (when equipped with internal water nozzles)
- vertical lifting of certain materials

Screw conveyors are designed to meet your specific usage requirements and to suit the materials being handled.

Screw diameter (mm)	Capacity (m ³ /h)	Recommended max. length
250	15	6.5
315	26	7.0
400	55	8.5
500	110	8.6
630	220	10.0
710	300	11.0
800	330	11.0
900	450	11.0
1000	520	12.0
1120	740	12.0
1250	850	12.0
1400	1200	14.0
1600	1400	14.0

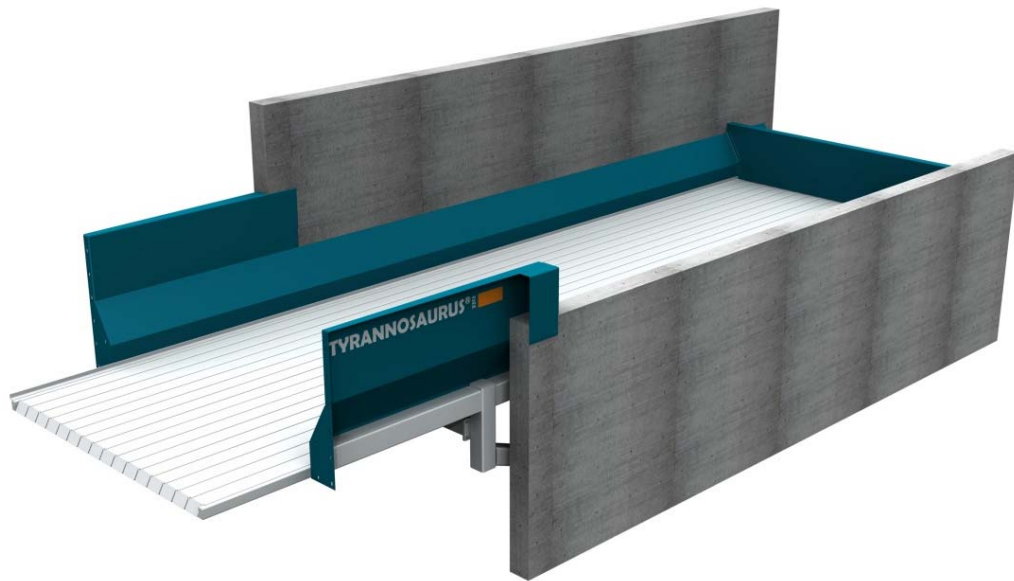
Please note that the values in this table are only indicative. The capacities have been calculated for handling woodchip or similar materials at an inclination of 0°.

IDEAL FOR HANDLING:

- biomass fuels (woodchips, bark, peat, agro biomass, pellets)
- solid recovered fuel (SRF)
- coal
- ash
- cement
- lime and minerals

Main advantages

- standard modular design
- horizontal, inclined and vertical designs
- tubular or U-shaped conveyor trough
- special design flights for difficult sticky materials
- screws with wear-resistant facing for demanding conditions
- simple construction means easy maintenance



TYRANNOSAURUS® Step Feeders are an excellent solution for optimising almost any feeding process where a continuous flow of material is needed. They are typically combined with a TYRANNOSAURUS® Shredder or a TYRANNOSAURUS® Biocrusher. A step feeder serves a buffer and a feeder for the process lengthening the loading intervals and enabling the front loader driver to take on more profitable tasks between loadings.

When attached for example to a shredder, TYRANNOSAURUS® Step Feeders can adjust their feeding capacity according to the level measurements taken in the shredder's feed hopper. This means the production capacity is kept at its maximum level all the time. Step feeders are not only capable of handling large pieces but also carrying a huge volume of material. The fully automatic feeding ensures that the process functions are constantly optimised.

TYPE	Width (mm)	Length (m)	Capacity (m³/h)
2412	2400	12	45
2418	2400	18	65
2424	2400	24	85
3212	3200	12	60
3218	3200	18	85
3224	3200	24	115

Please note that the values in this table are only indicative and they have been calculated for handling MSW. The thickness of the material layer used in the calculation was 1.5 m.

TYRANNOSAURUS® Step Feeders have a long lifetime. The number of wear parts has been minimised resulting in low operation and maintenance costs.

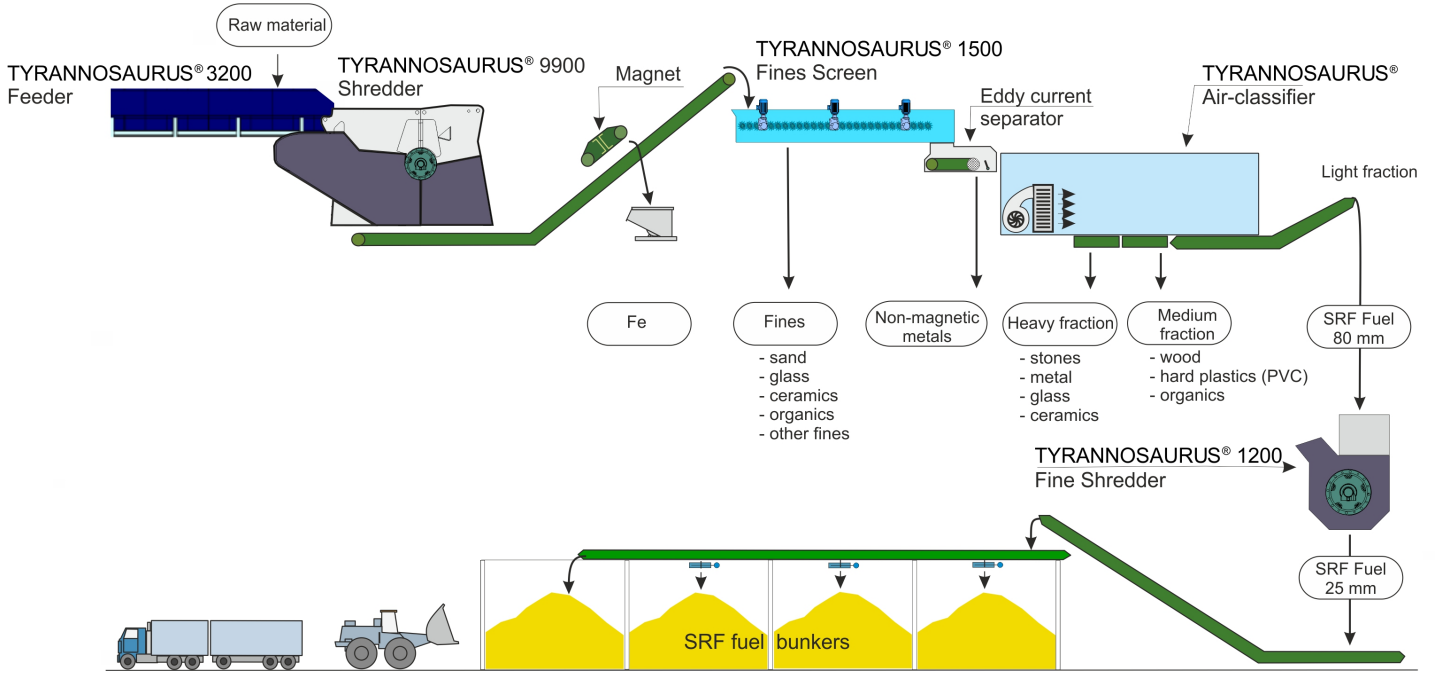
SUITABLE FOR ALMOST ANY SOLID MATERIAL:

- municipal solid waste (MSW)
- industrial waste
- demolition waste wood
- bark
- stumps
- biomass

Main advantages

- high availability and long lifetime
- low investment and operating costs
- low maintenance costs
- high buffer capacity
- loading intervals lengthened
- produces an even material flow to the next process
- designed to prevent material from tangling
- efficient operation
- heavy duty design
- easy to install

WASTE TO FUEL BY TYRANNOSAURUS®



Installation Sita Starol Ltd., Chorzów, Poland

Equipment Step feeder 3.2 x 24 m
 TYRANNOSAURUS® 9905 Shredder Capacity 30 - 50 t/h
 Automatic screening & separation systems
 Conveyors
 TYRANNOSAURUS® Air Classifier
 TYRANNOSAURUS® Fine Shredder Capacity 16 t/h (30 mm)
 Electrification and automation

Project description A turn-key plant for processing commercial and industrial waste and special wastes such as mattresses and textiles, furniture, plastic and paper rolls, bigbags as well as baled materials. The plant includes a two-stage crushing process. The product produced in the first stage has the particle size 80 % smaller than 100 x 100 mm. The second-stage product size is 30 mm. The end product is used as substitute fuel in cement kilns.

Start-up January 2008

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