3Bmagazin

2018

The modern **power plant**

MADE BY 3B

G2 **Pipe Conveyor**

ZERO WASTE

New **WASTE DISPOSAL** concept

Design

Shredding machines are born

Eco City

EVERY DETAIL COUNTS

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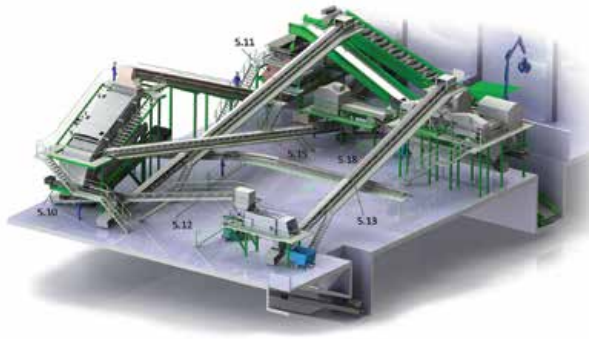

Preface

The Future

The future is infinite, it includes the past and it lies in the present. The demand for the new and the change as well as the desire for strive and research. To plan the future in the present requires dedication and knowledge: a vision. The company ethos of 3B has encompassed since the very beginning the research, the objectives and desires which will lead us towards the future. We have always been appealed by forward-looking solutions and our goals have been set accordingly.

We have started to deal with unique technologies with the aim to implement zero waste technology. We wish to establish an efficient, secure system which goes beyond today's limitations, allowing us to deposit only 10% of the waste produced by mankind in landfill sites.

When you leaf through our magazine, looking at the topics you will set out on a journey with us, where you can gain an insight into a very exciting future. In the magazine we would like to the readers' attention not only to our own products but also the protection of our environment as well as the importance of environmental awareness.

Our future is unpredictable and full of the unknown, but what is being formed now fills us with curiosity. Given today's accelerated digital advancement, the 3D printing, the artificial intelligence, the additive production technology are all great chances which could change the production processes basically and create totally new opportunities. We are setting out with courage and well-prepared, full of ideas. Please join us!

Zoltán Nagy
managing director

Zoltán Nagy Jr.
sales manager

Industries where we are present

We offer industry-specific machines and technologies. Our wide product range enables us to provide everything one-stop even for the establishment of a complete plant: machines, buildings, control management technologies as well as condition management systems.

Construction & mining

Stone, gravel, concrete, slag ... we have a solution for each material. Design, production and installation of mobile vehicles, fixed plants.

Energetics / Steel industry

Innovative technologies and products for the treatment, transport and shredding of biomass, RDF, alternative fuels, coal and other materials.

Agriculture

Construction of high performance transport and warehouse systems, special handling equipment.

Logistics

Warehouse and logistic distribution conveyor systems according to individual needs.

To enhance efficiency, reliability and quality

3B is the perfect partner for this

Waste management / Recycling / Secondary fuel

For the waste management and environment industries we offer unique technologies, machines not only for household and office waste disposal.

Port

We undertake the design and execution of complete port systems.

Established in 1992

The past 25 years left behind us has been full of interesting stories, adventures and challenges. The company established by 3 people has grown by now into a 160-people company.

The extension of our product portfolio and the continuous development of our production technology have enabled us to stay competitive. One significant precondition of our continuously improving productivity is the self-developed production management system, which underlies the production processes on our production site. Until the present day we have been striving unbrokenly to digitally transform our company. Our thanks for our success go primarily to our colleagues, whose work, dedication and passion move forward our company day by day. Together, we will have to brace ourselves for our challenging tasks in the future as well.

New technologies, forward-looking trends and solutions must be recognized by us on time and they have to be adapted by our company accordingly. Digitalisation is advancing at an extremely rapid pace thus allowing us excellent opportunities to make the most out of our products and offer the very best to our partners, as without their trust we wouldn't have come so far.
We will continue improving quality wishing to support our partners with up-to-date services.

Distribution of employees 2018

We are thinking back to the past years with honour and pride and looking forward confidently to the tasks which will have to be accomplished by us in the future. We are calmly looking towards to the future as we are aware of our potentials and the opportunities inherent in our company. Respect, responsibility, teamwork, passion and courage are the values giving direction to us to jointly accomplish our tasks. We are convinced that by representing these values we can get even more successful and we can overcome the challenges in the future successfully.

We are planning the future!

Quality assurance systems: ISO9001
ISO14001
DIN EN ISO 3834-3

Mining and the Construction Industry

In the mining and construction industries machines are exposed to especially heavy use. Weather, dust and heavy loads take a big toll on the equipment. Failsafe operation of them requires stable and robust design, safe technology, and solutions appropriate to the size of the task.

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Our machines in the world

Do you need professional assistance or spare parts?

South Africa
glass processing system
– bucket elevators

Austria
Dürnrohr Power Plant

Hungary
biomass plant, disc screen

Netherlands
waste incinerator – ash removing system
– conveyors and steel constructions

Germany
Wood Processing Plant: conveyor belts
and steel structures

Hungary
electronic waste processing plant

Germany
feeding hopper with belt feeder

Contact us or our representations in Europe

Thailand
communal waste processing

Bulgaria
communal waste processing

Hungary
municipal solid waste processing plant

Our colleagues are pleased to be at your disposal

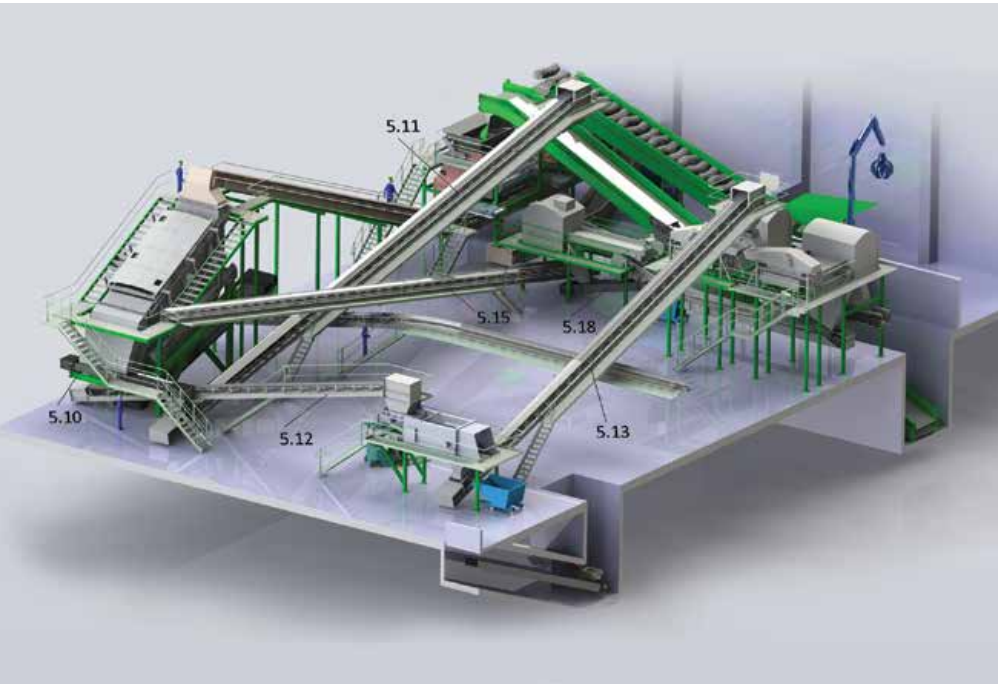
Hungary
plastic waste processing plant

Rumania
electronic waste processing plant

Made by 3B

How are a conveyor belt, an elevator or mobile track mounted equipment produced? How is a machine made from steel plates? What is the plant like which is owned by one of the most dynamically developing machine producers?

Our customers, partners and everybody interested are always welcome to us here in Zalaegerszeg. By some delicious coffee and refreshment we strive to ensure that you will be able to make the best of the cooperation with us. We would like to accompany those who have not visited us on a virtual tour in our factory.



Raw material supply for each work is carried out on individual orders. Production may start only from raw materials whose origins have been testified by our suppliers with certifications.

Our laser cutting machines care for the shredding of plate components. Each component gets an identification label so that it can be tracked down during the production process. This is greatly supported by our self-developed company management system, which we have been developing during our daily work continuously. We can see when the component gets into the KARDEX vertical storage system… or whether its bending has not been done yet.


3B


3B

The identification of the produced components is carried out continuously, so that we can get information about their conditions during the painting and assembly processes.

In the field of welding a separate robot cell has been installed this year, which carries out the welding of complete belt conveyor frames. With the installed rotation unit the robot itself moves the 3-metre-long elements independently. We feel that this could be the greatest innovation and we are planning to purchase further robots as well.

We possess all types of turning machines which are essential in the machining of the machine components produced by us. At the profile machining work station after drilling and sawing processes the components are cut to size and get into the production process of steel constructions.

Through the computer network system of our plant the automated machining equipment such as the bending machines or the laser cutting machines are provided with ready-to-use programmes and data about the preproduction process.

In our database each used component is available, if any of it happens not to be in stock, we can produce it within a short term and deliver it to its destination. The original spare parts greatly contribute to the performance of the machines, its safety and life span.

The impressive 5000-m^2 glass facade of our assembly hall lets through an immense amount of light. Here are the finished machines assembled and prepared for delivery by us. The components used in the machine production come from the best producers in the world. In consequence, there is no need to worry for our customers whichever part of the world they may come from as the suppliers of each element run extensive service systems all over the world.

As a result of our investment in 2015 the new painting hall accommodates new up-to-date technology. Thus the quality of liquid coating has improved i.e. now we can execute powder coating even up to 12 m.

The way is long from the idea to its implementation. We have been working hard so that our customers can feel that

3B is more than a simple machine factory

With our products and services we wish to ensure our customers a safe and flexible background on which they can build their long-term plans while feeling at ease.

Colourful opportunities

Which colour do you prefer?

Painting is more than a protective surface: it determines the appearance of the equipment and thus our customers' first impressions. At the same time it is the most energy consuming process in the machine production. Our new painting technology installed in 2015 enables the efficient utilisation of resources, enhances our competitiveness and parallelly it optimizes quality. By applying state-of-the-art technology we can carry out the following surface treatments:

Surface preparation equipment (according to ISO 8501-1 standard)

1. Shot-blasting machine – pass-through system, roller conveyor equipment.
   Overload size: • width: 1500 mm
   • height: 500 mm
2. Shot-blasting room with automatic recovery system, where the surface cleaning is done in a closed system with manual shot blaster.
   Cabinet size: • width: 3.8 metres
   • height: 2,7 metres
   • length: 13 metres
   Max. work piece size: 2,5 x 2,5 x 12 metres
   Blasting material: steel abrasives (SAE-J-444 standard)

Liquid coating (according to ISO 12944 -5 standard)

We paint with 2-component paint and possess a computer controlled paint mixing equipment.
The painting may be carried out:

- horizontally in a cabinet (cabinet size: 6x24 metres, up to 20 tons)
- suspended in a cabinet (cabinet size: 6x24 metres, up to 2x3 tons)
- or on conveyor (the acceptable size of the elements that are allowed to be hung on the conveyor: 3000x600x 1800 mm)

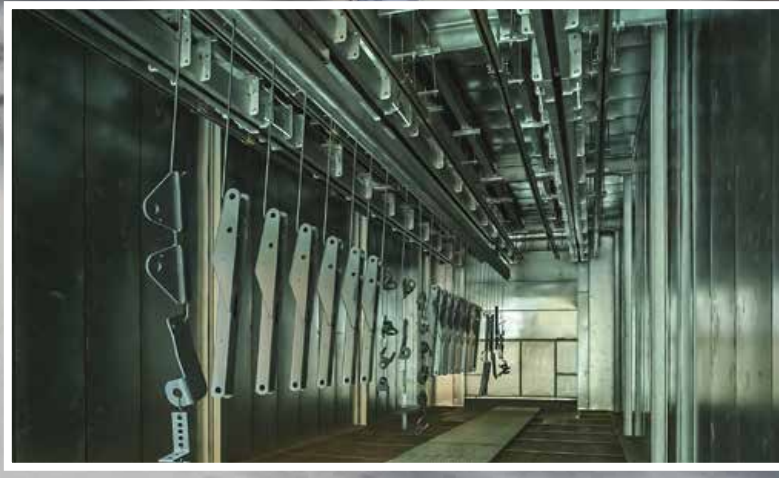
Powder coating (according to ISO 12944-5 standard)

Max. work piece size for painting:

- width: 1000 mm
- height: 2000 mm
- length: 12.000 mm

Elements of technology:

- vertical spray type pre-treatment cleaning system
- powder spray booth (14x3,6x4,6 metres)
- curing oven (14x1,6x4,6 metres)
- overhead automatically conveyor and storage system



Eco City Project

New generation of waste sorting plants

Within the framework of consortium cooperation 3B Hungaria Kft and Szabadics Zrt have implemented the construction of an up-to-date waste processing turnkey plant, which was a highly ambitious and inspiring project from every aspect.

Project data:

Venue: Hungary, the town of Zalaegerszeg and its surroundings
(ca. 192 000 inhabitants)
Waste volume: 60.000 tons/year
Waste composition:
- 51% bio-organic waste (ca. 30.000 tons/year)
- 12% PVC and silicate waste
- 14% recyclable waste (PET, Fe, Al…)
- 23% RDF (12.000 tons/year)

While designing the waste sorting plant we intended to create the simplest possible system with the least possible energy consumption. We simplified several processes based on our experience with previously constructed plants. We developed four new equipment types which would allow us the single-handed management of the plant to supply our customers. Among these the 5F separator (KLME) is under international patent protection for its currently outstanding technical solutions.

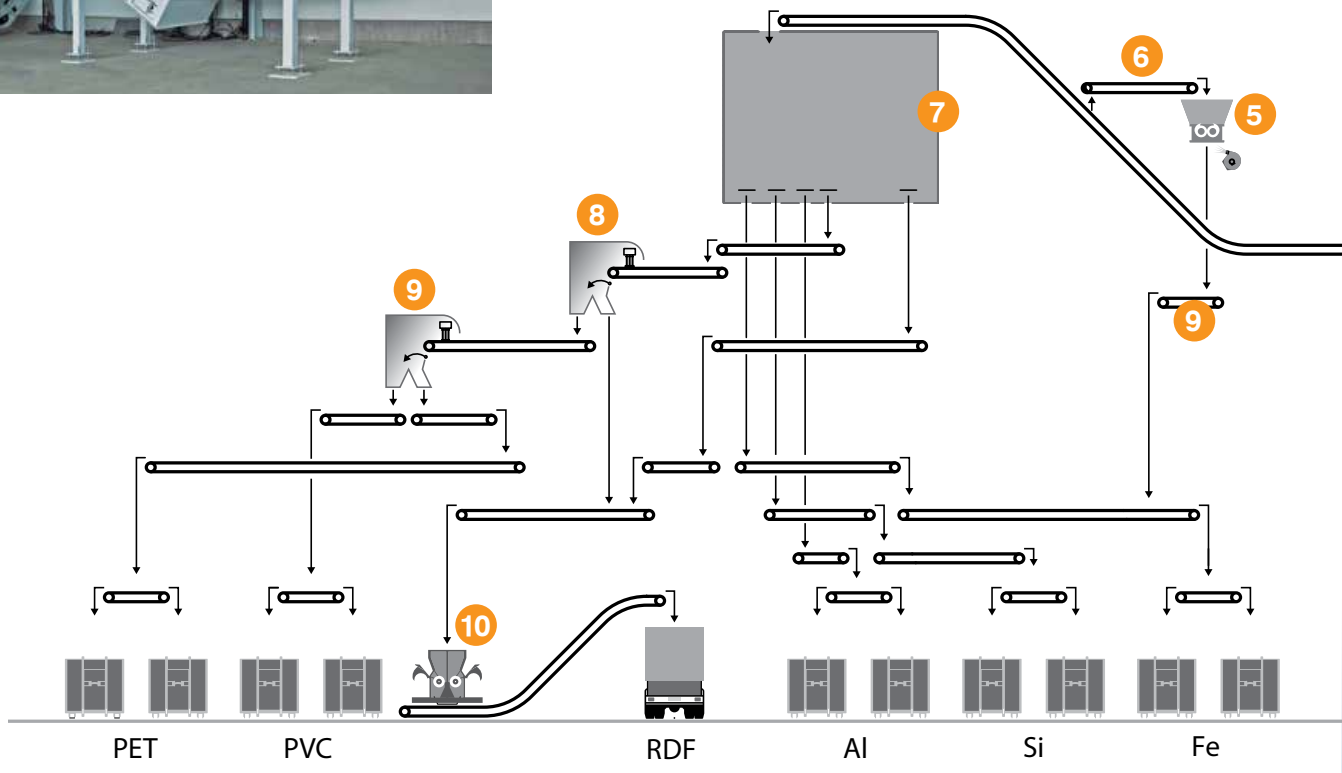
We could win the support of the town leadership of Zalaegerszeg for our concept, thus a site was provided by the town for us near the current waste disposal plant. Following thorough waste examinations the plan for the technology was drawn up and the construction work started. In the meantime the pilot/trial tests of the newly developed equipment types were going on to improve their operations.

Brainstorming and consultations with the project participant universities and specialists have given us a new direction: our focus has shifted on the tasks beyond sorting.

At present we are still working on it:
the implementation of a ZERO WASTE CONCEPT.

In the first stage of the project we built this plant, where the mechanical processing of communal waste takes place. Thus the quantity of recyclable substances from mixed municipal waste increases, less waste goes to landfill-sites while secondary raw materials and secondary fuels are supplied more cost-efficiently in the required quality.

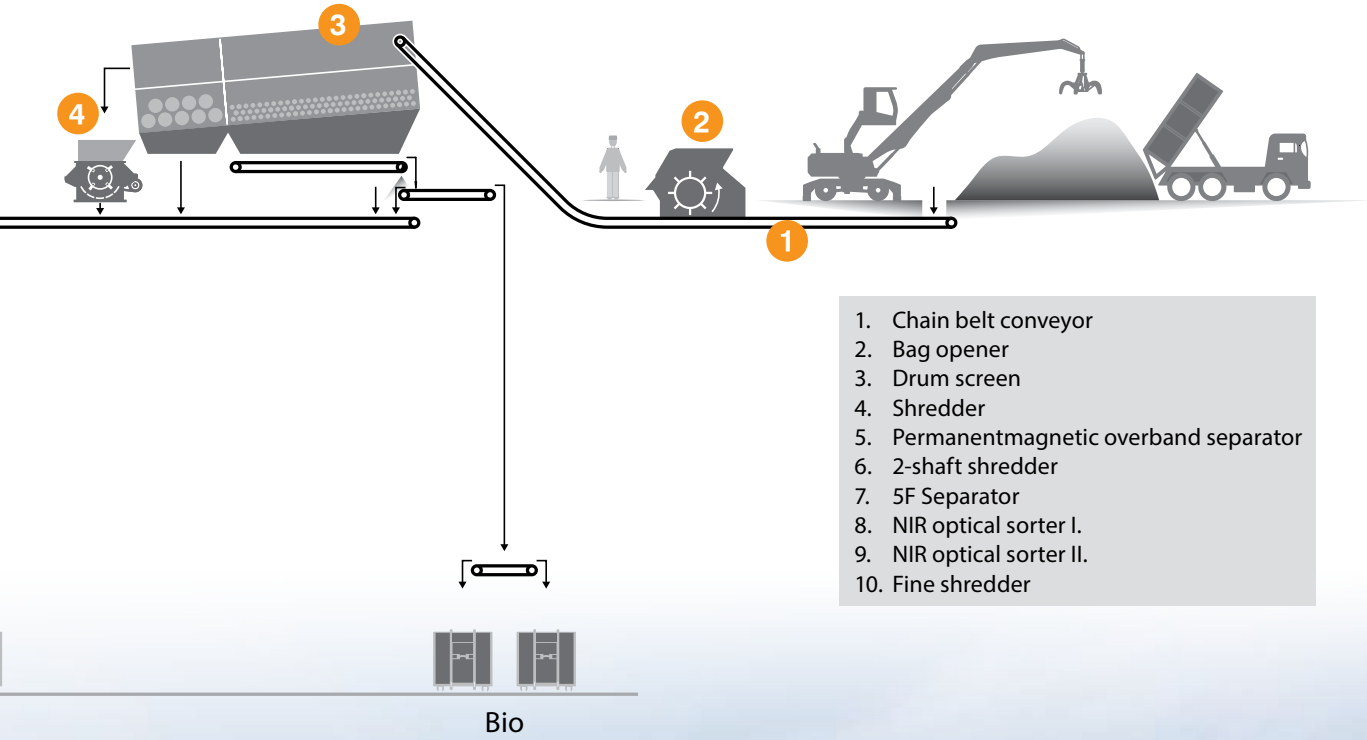
COMMUNAL WASTE MANAGEMENT



In the second stage we wish to build a small power plant where non-recyclable substances are processed and electricity is generated. Similarly to the sorting plant concept we think in small and compact dimensions. Our purpose is that no further landfill shall have to be built every 20 years from urban waste and to leave a clean, livable environment to future generations.

Zalaegerszeg is a town in Western Hungary with 62.000 inhabitants and a green-minded way of thinking. The city operates door-to-door and container selective waste collection. Container collection with 4 fractions (paper, plastic, glass and metal) whereas door-to-door collection with 5 fractions (pine wood, glass, junk clearance, plastic, paper and green waste). The town runs its own biogas plant on a waste water treatment site and the city buses are fuelled by the generated gas.

SYSTEM – FLOWCHART



1. Chain belt conveyor
2. Bag opener
3. Drum screen
4. Shredder
5. Permanentmagnetic overband separator
6. 2-shaft shredder
7. 5F Separator
8. NIR optical sorter I.
9. NIR optical sorter II.
10. Fine shredder

'Museums preserve the past while the future lies in waste processing plants.'
(T. Anson)

Solutions to modern city waste

1999

It was in 1999 that we took part in the construction of a waste sorting plant for the first time.

2015

Since then we have gained a wealth of experience and knowledge during the establishment of many further processing plants.

2016

A few years ago we began dealing seriously with various waste-treatment technologies and the improvement of related machinery seeing that the recovery of a high proportion of waste was still not solved and the non-recyclable waste went to landfill.

2017

Three Hungarian universities, one research centre and several specialists joined the work.

Finally, a new concept was drawn up for the implementation of ZERO WASTE strategies with the following goals:

01 To establish a simple, low-budget waste sorting plant with small space requirements and the least possible human labour, so that 1 ton of waste could be processed with as few costs as possible.

02 To make the selected waste recyclable in an increasingly large percentage.

03 The remaining post-selective substances should be utilised on the spot without delivery to avoid further environment contamination.

04 The non-recyclable waste will be utilized through pyrolysis or in a small power plant generating electricity.

05 To be able to generate energy not only from municipal waste but from industrial waste and sewage sludge as well.To create a sustainable economic solution.

06 To provide waste management solutions for small and middle-sized towns but to be able to operate them in a district of a large town.

management in the future

Waste is no more a mass of substances to get rid of but all the more valuable raw material allowing us to save primary resources.

We have been developing complex solutions for settlements and cities where after the waste recycling stage– and the removal of recyclable materials – the non-recyclable remnants could be promptly gasified in the adjacent pyrolytic plant or the small power plant to generate electricity or district heat. The appropriate solution will be determined by the energetic capacities of the town and a waste analysis.

We offer various constructions for waste-to-energy recycling:

1.
Thermal utilisation of bio fraction and RDF on the spot, in a small power plant.

2.
Utilisation of bio fraction in biogas plant.

3.
RDF utilisation with pyrolytic technology.

We already have professional partners for the practical implementation of the two former ones, the third one is in an experimental stage, but the flagship plant with RDF recycling testing will be ready this year.

3B Hungary undertakes the design and execution of complete technologies. We hope that we can contribute to less waste landing in the landfills in your environment, too.

New machines, new design

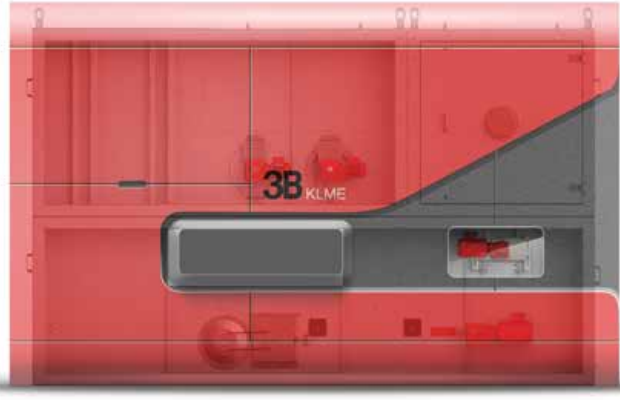
We keep striving to go beyond our limits … but what is the next step?

From the mixed solid municipal waste recyclable materials have to be recovered in greater proportion. One of the most important means to achieve this goal in the future is the so-called 'sensor based sorting' (sorting machines based on sensors). For the past few years our company has been developing plants which assist this guiding principle. Whether it may be external design or functional operation, the concept and operation of the new models yield in all areas exciting and interesting ideas.

5F separator

The 5F separator unites four plants in one combined separator reducing the future space requirement of waste separator plants, there is no need for four separate machines or conveyor belts connecting them. This union has brought both benefits and hardships. During their development some difficulties arouse due to the fact that the separators influenced each other's operation respectively and the cooperation among the component units had to be harmonised precisely.

The 1200mm-wide 5F separator was designed by us primarily for sorting out the 60-200mm fractions of mixed municipal solid waste. We carried out successful experiments with the 400mm-wide separator prototype for sorting out shredded WEEE (e-waste) samples too, so the equipment can be used for other material streams as well. The equipment contains four units: two air current machines, one constant magnetic separator and an eddy current separator.



The 5F separator can sort out the following products:

1. Fe,
2. Inert materials,
3. non-ferrous metals,
4. 3D-light materials,
5. 2D-materials such as film and paper

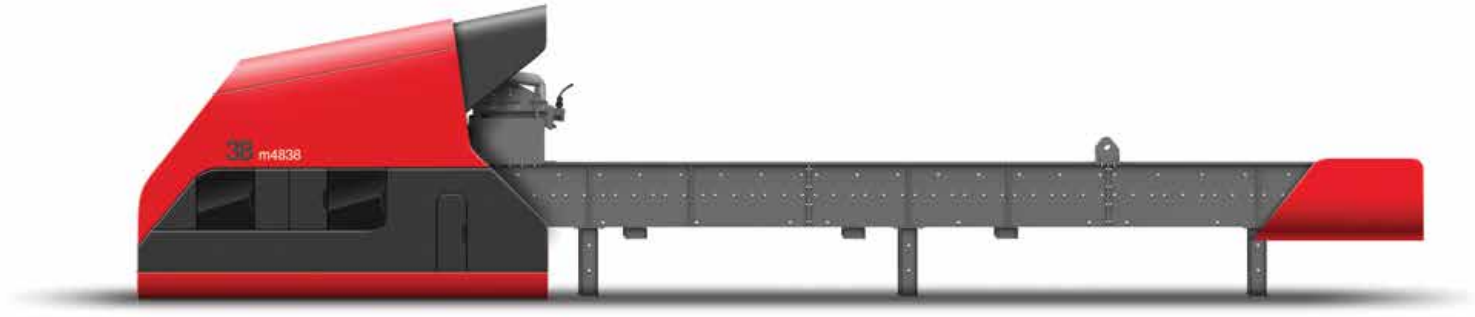
Waste processing can be carried out with the new 5F separator at a more favourable price with less specific energy consumption.

Technical description:

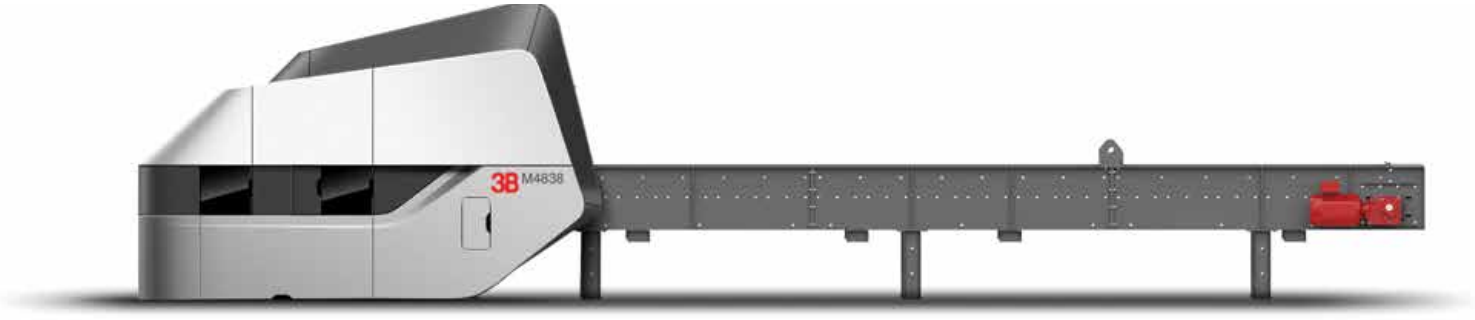
- Patented product
- Feedable particle size(mm): 60-200 (MSW)
- Sorting capacity (t/h): max. 8 t/h
- Electricity consumption(kW): 22
- Outputs: Fe, Al, Si, 2D, 3D
- Weight (kg) : 8000
- Size: (t/h): max. 8 t/h 2000x2850x4500

NIR Optical Sorter

- Sorting width (mm): 1000/1200/1600/2000
- Sorting capacity: depends on task and material
- Perceived particle range: (mm): 3-300
- Perceived materials: paper, cardbox, wood, TETRA, textile



Each substance has an easily identifiable light reflection curve, the so-called spectral fingerprint. The control board of the sorter tests 'these fingerprints' by means of a hyperspectral imaging camera and distinguishes them from each other. The substance to sort can be adjusted on the user surface of the software, which is selected after it has been identified with the help of pneumatic blowers from the falling substance stream at the end of the conveyor belt. It can be controlled on the spot or from a distance, through ethernet Modbus TCP/IP network.



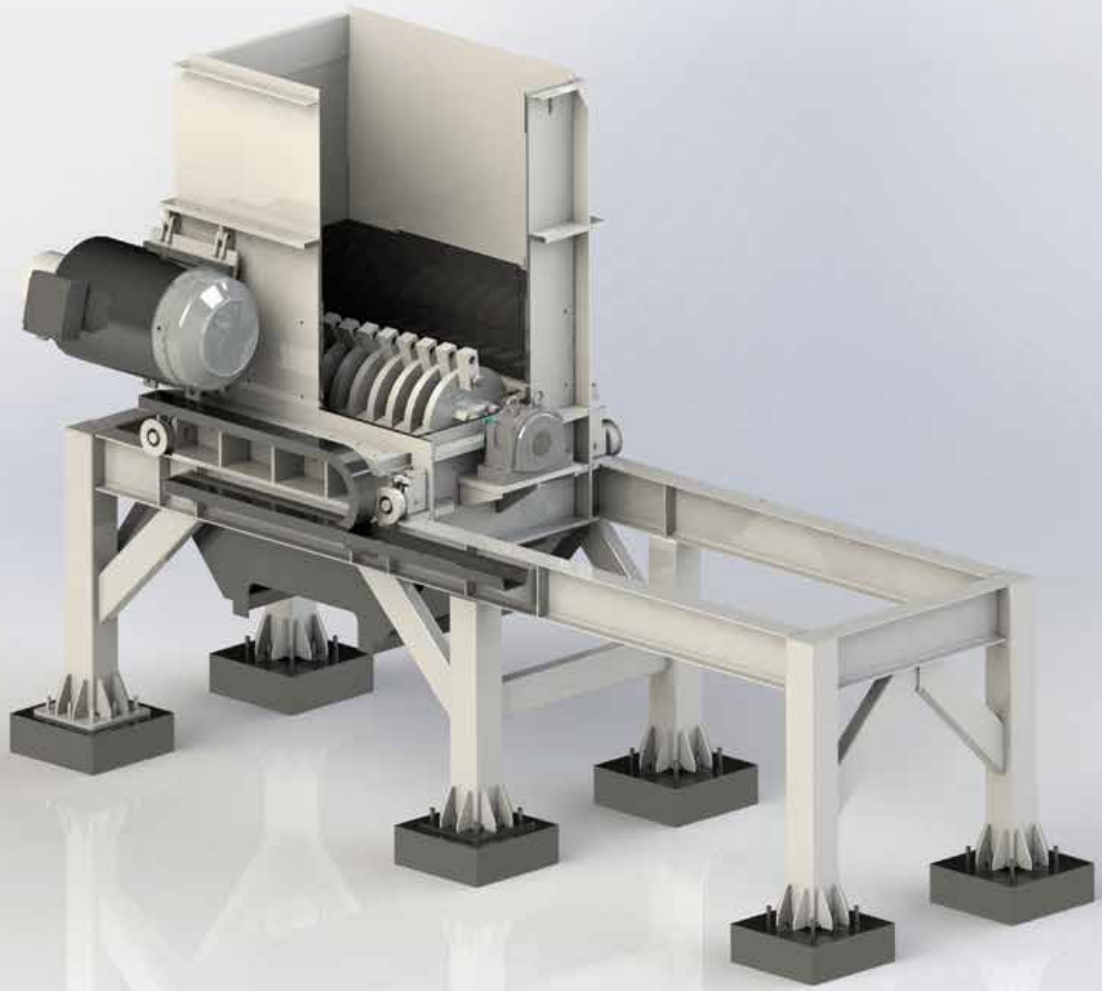
The machine design exemplifies the fact that 3B is making its own way. It is a way with the primary goal of functionality despite any emotional influences.

Shredding machines are born

They don't want to save the world, they just do their job, these are our new shredding machines. Their development continued earlier model. They are robuster and more reliable.

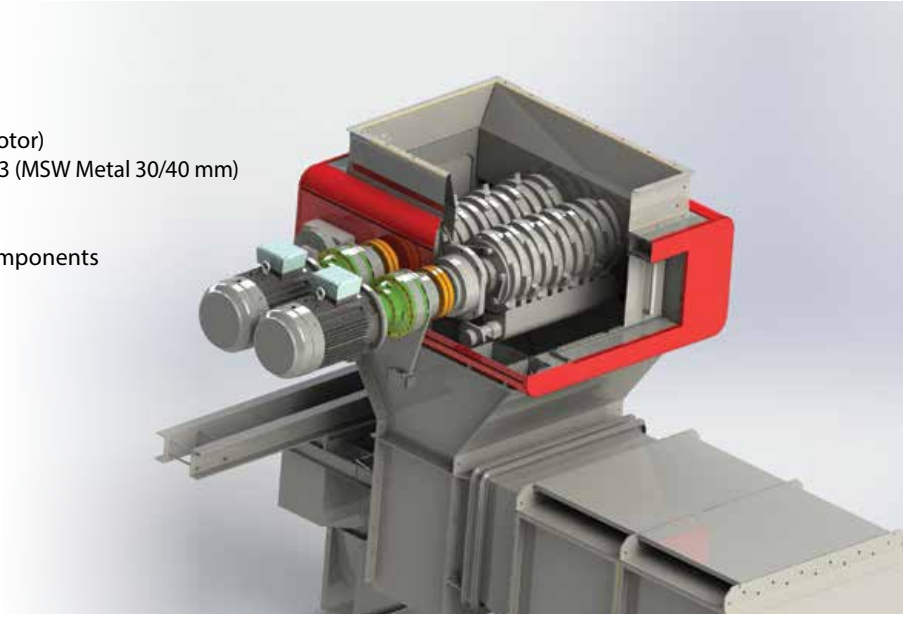
Single-shaft shredder

- Motor capacity (kW): 132 (AC-motor frequency driven)
- Throughput performance (t/h): 1-1,5 (20/50mm)
  5-6,5 (150/200mm)
- Charge opening (mm): 1500x1000
- Total weight (kg): 6500
- Sturdy construction
- Compact design, low maintenance and service costs
- Developed for MSW
- Mesh size (mm): 30-320 (Mesh size according to customer requirement)
  Number of Flail teeth: 44
- Rotor weight (to): 2



2-shaft shredder

- Motor capacity (kW): 2x30 (AC Motor)
- Throughput capacity (t/h): max. 2-3 (MSW Metal 30/40 mm)
- Total weight (kg): 4000
- Sturdy construction
- Simple structure with reliable components
- Rotor Speed (rpm): 30



Bag opener

- Drive capacity (kW): 30 Hägglunds drive or AC-motor frequency driven
- Throughput capacity (m^3/h): max. 200
- Working width (mm): 1500
- Total weight (kg): 5400
- Sturdy construction
- Compact design
- It can be used for many different types of materials: packaging materials, household waste, paper waste, etc ... Overrange protection and automatic switch-off in case of blockages cauzed by bulky and disruptive material.

Pyrolysis in waste management

Our company, the 3B Hungary Ltd. works on waste management projects which provide sustainable solutions for the environment. Our goal on waste management is the utilization of as much locally generated waste as possible.

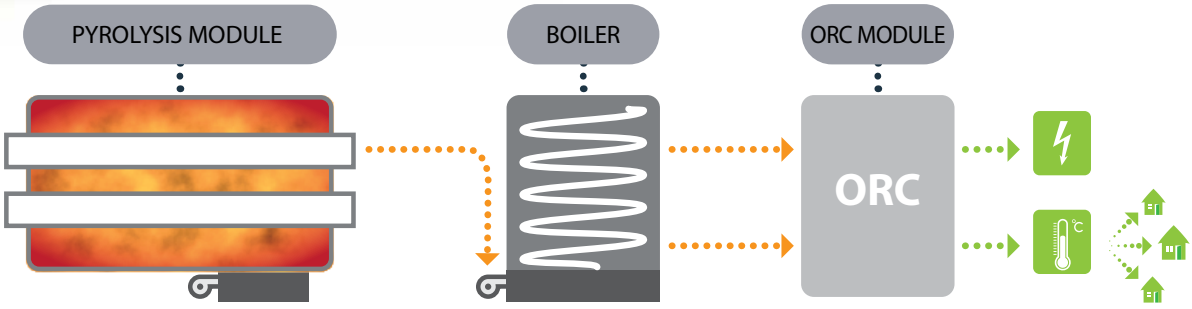
We have been developing a waste-to-energy recovery method that is capable of converting MSW, RDF, organic waste, or contaminated polymer waste into energy carriers thus generating clear and safe energy production.

The technology works on the principle of thermochemical degradation (TCD) of carbon-based feedstock materials in oxygen-free environment. First, we pretreat the waste, generating pellet, a high-density input material.

The pyrolysis process takes place at an intermediate temperature (around 600 C°-700 C°) in oxygen free environment producing hydrocarbon gas and oil derivatives as well as and high caloric volume carbon black. All the produced products are safely storable, transportable, or locally utilizable. Our well-designed primarily RDF-based technology features several safety elements to prevent emission and in addition it does not produce any by-products or contamination. This way only utilizable industrial base materials are produced making the process partly a waste recycling technology.

However, our technology is basically developed for the waste to energy utilization of RDF, it can also effectively handle waste polymer mixtures. The quality and quantity of the produced hydrocarbon gas and oil derivatives depend on the input materials. In case of the handling of PE, PP, PS or other hydrocarbon polymers the products are mostly oil derivatives, in 70-80%., with 10-10% gas and carbon black.
Our developed product treatment process can handle the quality and quantity shifts generated by the differences of the input materials, so every kind of hydrocarbon derivatives will be collected in the same way, getting into the containers in the proper quality according to their utilisation.

PYROLYSIS SIMPLIFIED PROCESS FLOW DIAGRAM



Advantages of the technology:

- high efficiency, full-scale utilization of the input material and energy content
- self-supporting technology, which does not need additional energy in case of continuous operation
- meets the strictest emission regulations
- handles tar preventing the generation of dioxins and furans
- modular design, cascade equipment for different capacity need
- simple built-up, low maintenance, high reliability

With the cascade design and user-friendly properties the technology has universal application ability. Significant income could be generated from the produced electricity and heat energy. Our test period is still running, determining the electricity and heat generation effectivity from a ton of RDF.

The long-term goal of our company is the realization of eco-friendly projects, which can reform the waste generation and management practices in the word.

Vertically

Bucket elevators are special types of equipment suitable for delivering bulk materials vertically. We started/commenced 20 years ago the development of these machines specifically for heavy duty industrial usage. Both the frame structure and the bending and …unit are dimensioned for 24-hour operations, they are robust but free of unnecessary parts. Under all circumstances they operate reliably. Likewise, bucket and chain elevators are also available in our product range. Their performances are listed in the following chart:

BUCKET ELEVATORS										
Bucket width b (mm)	160	200	250	315	400	500	630	800	1000	1250
Transport capacity (m /h), Bucket DIN 15 324	13,5	21	33	53	77	120	191	268	428	555
Belt speed (m/s)	1,3	1,3	1,32	1,32	1,4	1,5	1,55	1,6	1,66	1,66

Our bucket elevators are present in several parts of the world: in almost every country in Europe, as well as in the USA, the Republic of South Africa, the Ukraine, Russia and Tunisia.

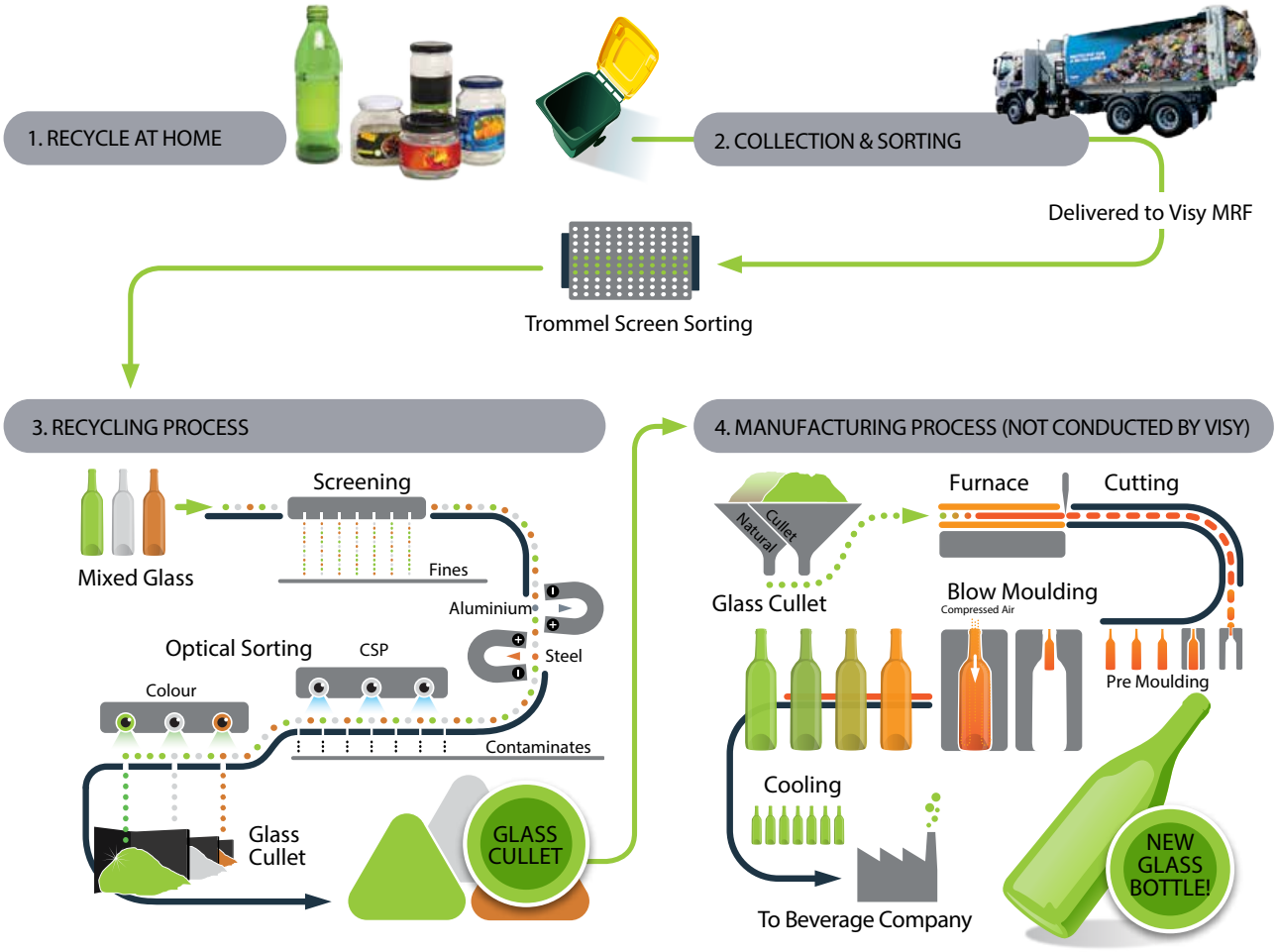
They are widely applicable as they are considered commonly used technological equipment in the construction, chemical and mineral powder industries. We supply ca. 100 pieces of equipment annually. 70-80% of the bucket elevators produced by us are sold for recycling purposes, primarily for glass processor companies.

In these systems the bucket elevators execute the vertical delivery of glass debris between the processing levels respectively as well as the feeding of silos.

The machine parts which may come in contact with glass are equipped with wear protection. It could be HARDOX or even chromium carbide overlay wear steel plate. This way a long, undisturbed operation period is guaranteed.

3B undertakes the design and execution of complete glass processing plants.
Feel free to turn to us with your ideas!

GLASS RECYCLING PROCESS DIAGRAM



Given the advancement of processing technologies waste glass can be recycled into new glass production with fewer costs and less energy. Due to the appearance of optical selectors and the spread of metal and other pollution separators processing industries need less human labour, which results into increased economic efficiency.

Urban Mining

Our company has been participating in the construction of several major e-waste recycling plants. Each recycling plant uses unique solutions and technologies, the related material handling machines and technological steel structures are delivered by 3B.

The recycling process aims at gaining possibly clean marketable secondary raw materials possessing the highest possible grade of cleanliness while pollutants are eliminated safely by this technology. Relying on well-tried and tested solutions our machines cope successfully with the shredded machine parts that may turn out to be difficult to manage during delivery. The constantly rolling, popping condensers and magnets meant a highly challenging task to solve during the construction of our first plants. By now we have developed conveyor belt models and construction solutions that ensure the smooth delivery of all types of materials without problems. In addition, their operation requires few wear parts. The suppliers of in-built components have representations and factories in each point of the world, thus whenever a machine part is needed it can be purchased within a short term.

The term URBAN MINING originally meant recycling valuable metals from electronic waste. Now it denotes every work-process with the aim of waste-processing and gaining back secondary raw materials from products out of use whether it is a demolition of a building, disassembling a car or the processing of a fridge.

Up to 13% of the 50 ton e-waste annually generated at global level is recycled under professional circumstances. The vast majority of discarded electronic devices get transported to China, India and Ghana. There anything that is repairable will be sold to developing countries where they get disassembled into parts to gain valuable machine parts and metals, then the devices will be burnt causing considerable environmental and health-related damage. The problem is exacerbated by the fact that the population in China, India and certain African countries is accumulating and replacing electronic devices to an increasing extent. The primary aim of electronic device recycling industry is to regain at least 70% of the whole mass of devices sold 7 years before.

The mining industry of the future is getting more and more ‘urban’ and by the end of the century raw materials will be gained mainly from recycling rather than from mineral processing. Thus in the future products thrown away into the trash have to be principally considered raw materials.

New concept in waste disposal management

We have been participating in the construction of waste treatment facilities for about 14 years. We have got several international and national projects behind us. Our project experience has made it possible for us to develop our own machines as well as design and produce complete turnkey plants.

In 2015 we built two plants which already represent a new direction. On the 6-hectare site everything is available which is inevitable for complete waste treatment. Owing to the fully automatized technology the amount of materially recoverable waste is on the increase while the materials to be disposed of in landfill sites are decreasing. Thanks to the new concept the plant in Békéscsaba is ranked as one of the most modern waste processing facilities in Central Europe.

Sorting system with drum screen, NIR and Eddy current separator

Waste reception building

Its primary task is to process mixed waste on a daily basis, that is on each collection day the mixed municipal waste is processed, which is justified for public health reasons.

Feeding may be done on two lines, either of them contains a pre-shredder too. The capacity of the lines is 19 t/h respectively.

In the first stage the waste is selected through a drum screen into fractions of various diameters to make the sorting process easier.

The organic fraction under 70-80 mm is taken out from the total stuff flow and the magnetisable metals are removed with an overband separator from it, and then grading it with a disc screen and an x-ray sorter we gain inert and compost fractions. The plastic/paper waste separated previously with the optic sorter equipment and the small-sized plastic non-recyclable waste separated somewhere get over into the RDF material flow, after that the PVC and other thermally non-recyclable or toxic combustion waste will be separated. The 'cleaned' organic material fraction will be biologically stabilised – due to lack of fraction recycling – in the treating area. Later on the fraction over 300 mm gets back into the feeder area where it can be put back on the pre-shredder again.

Waste fractions

- mixed collected municipal solid waste

- selectively collected municipal solid waste (from waste collection islands, and waste collection yards)

- possibly clearing waste

The leftover 70-300 mm waste gets over to an optical sorting machine, where all plastic and paper wastes are removed, then the magnetisable and non-magnetisable metals are selected (with an overband separator belt and eddy current separators). Next, according to their specific weight it will be selected into plain (2D) and box-type (3D) fractions and the leftover material streams will be selected in their own 'material' primarily with optic sorters, then the whole material flow will get into the manual sorting cabins (closed, climatised room with independent air technology) where it comes to the post control phase of the sorted fractions and the leftover waste (unrecognisable with optic devices e.g. stuck, heavily polluted waste).

The recyclable and leftover fractions (PE foil clean/coloured, PET bottles, PP, LDPE, Tetra Pack, PET coloured, cardboard, mixed paper HDPE) get into temporary storage boxes built under the manual sorting cabins, where they get on the outlet belt conveyors for baling into the baler station, where after baling they will be weighed singly and labelled with individual identification tags.

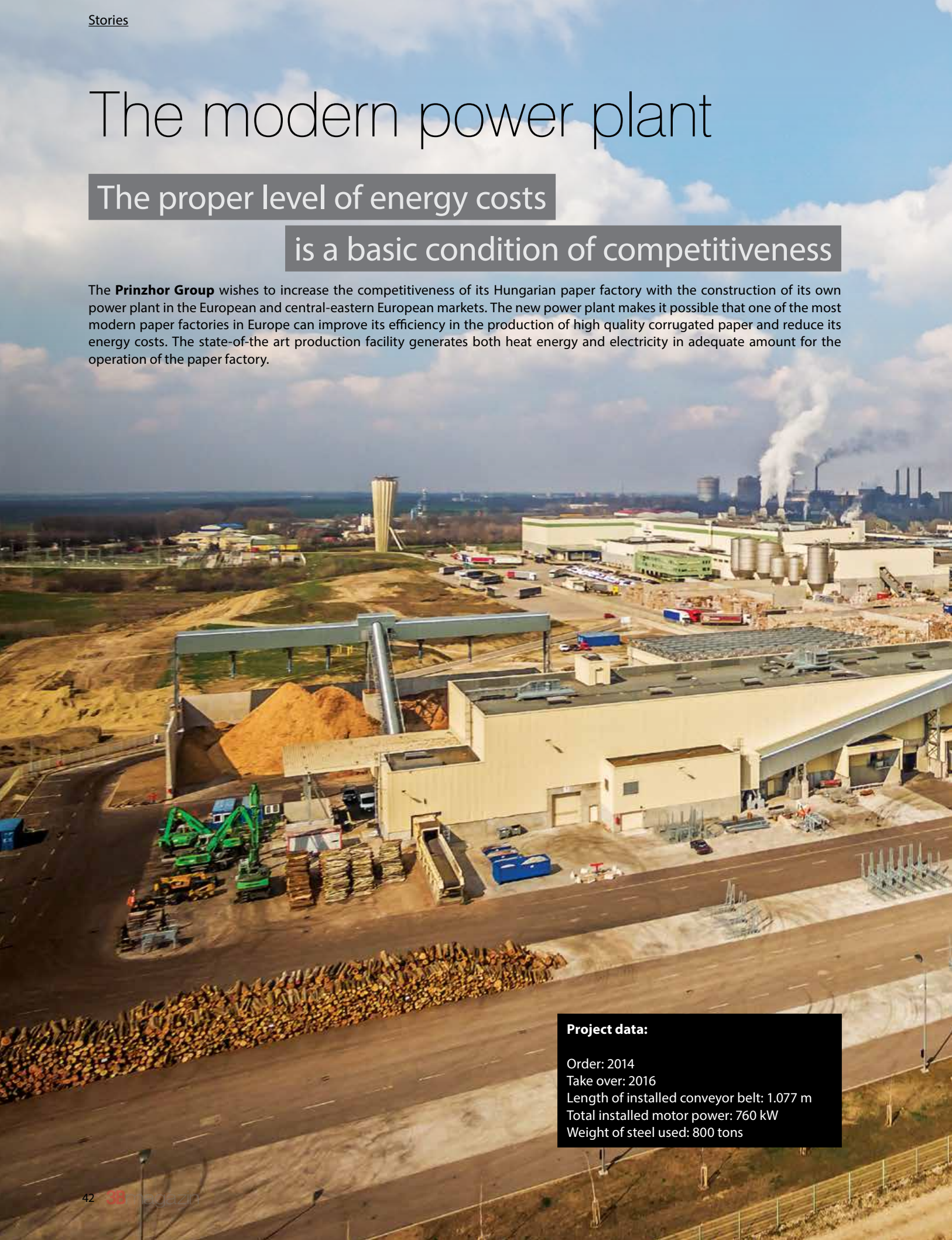
Project data:

Project launch: 2014
Site: Hungary
Take over: November 2015
Capacity: 120 000 t/y
Installed conveyor belt length: 1055 m

The modern power plant

The proper level of energy costs is a basic condition of competitiveness

The **Prinzhor Group** wishes to increase the competitiveness of its Hungarian paper factory with the construction of its own power plant in the European and central-eastern European markets. The new power plant makes it possible that one of the most modern paper factories in Europe can improve its efficiency in the production of high quality corrugated paper and reduce its energy costs. The state-of-the art production facility generates both heat energy and electricity in adequate amount for the operation of the paper factory.



Project data:

Order: 2014
Take over: 2016
Length of installed conveyor belt: 1.077 m
Total installed motor power: 760 kW
Weight of steel used: 800 tons

The 150 million Euro's worth of power plant uses solid fuels such as biomass, coal as well as production waste generated in paper production and stored in landfill sites.

Its fuel consumption capacity is 172 MW, in relation of the generated heat and electricity its capacity is 158 and 42 MW. The efficiency of its energy production is outstandingly high: 75%, which -alongside with the favourable fuel composition- makes it possible that the CO_2 emission of the factory could be reduced by 35%.

In order to minimise environment contamination the power plant was equipped with the most up-to-date fuel gas filtering equipment, which makes the operation of the plant almost unnoticeable for the dwellers of the surrounding settlements.

At the beginning of the year 2013 the paper factory approached us with the project. We were given the basic data and a flow diagram at the first meeting, and in succession of an almost one-year long joint preparation and design work our company was entrusted with the design, production and assembly of the complete material handling system of the power plant. 3B could supply the necessary rollers, hydraulic bottom dischargers, disc screen, conveyor belts, feeding hoppers, belt bridges and any other steel constructions necessary for the technology. The other machines which were needed for the system were ordered by the customer (HHP), but we were in charge of their installation.

The conveyor system is equipped with the most modern safety technologies.

The prepared substances from the individual lines are transported on 3 conveyor belts through a 160 m-long belt bridge into the silos providing the daily supply of the furnace.

The fuel reception and preparator system is divided into 4 areas, which contain as outlined below the following.

The biomass line

- receiving wood waste and purchased wood chips by trucks
- storing purchased and in-house produced wood chips
- preparing the biomass for the boiler feed silo
- mixing sludge to the biomass
- delivery of biomass and sludge to the boiler feed silo

Coal line

- receiving and unloading coal
- storing coal
- crushing coal, and metal removing
- delivery of coal to the boiler feed silo

Paper sludge handling

- receiving sludge by trucks
- adding the screened fine reject to the sludge
- homogenising the sludge+fine reject and adding it to the biomass
- delivery of sludge using biomass as carrier material to the boiler feed silo

Reject line

- receiving loose reject and rags by trucks
- preparing and shredding the reject for the feeder silo, metal selection, PVC separation with optic selectors
- making puffer from the prepared reject in a temporary silo
- delivery of reject to the boiler feed silo

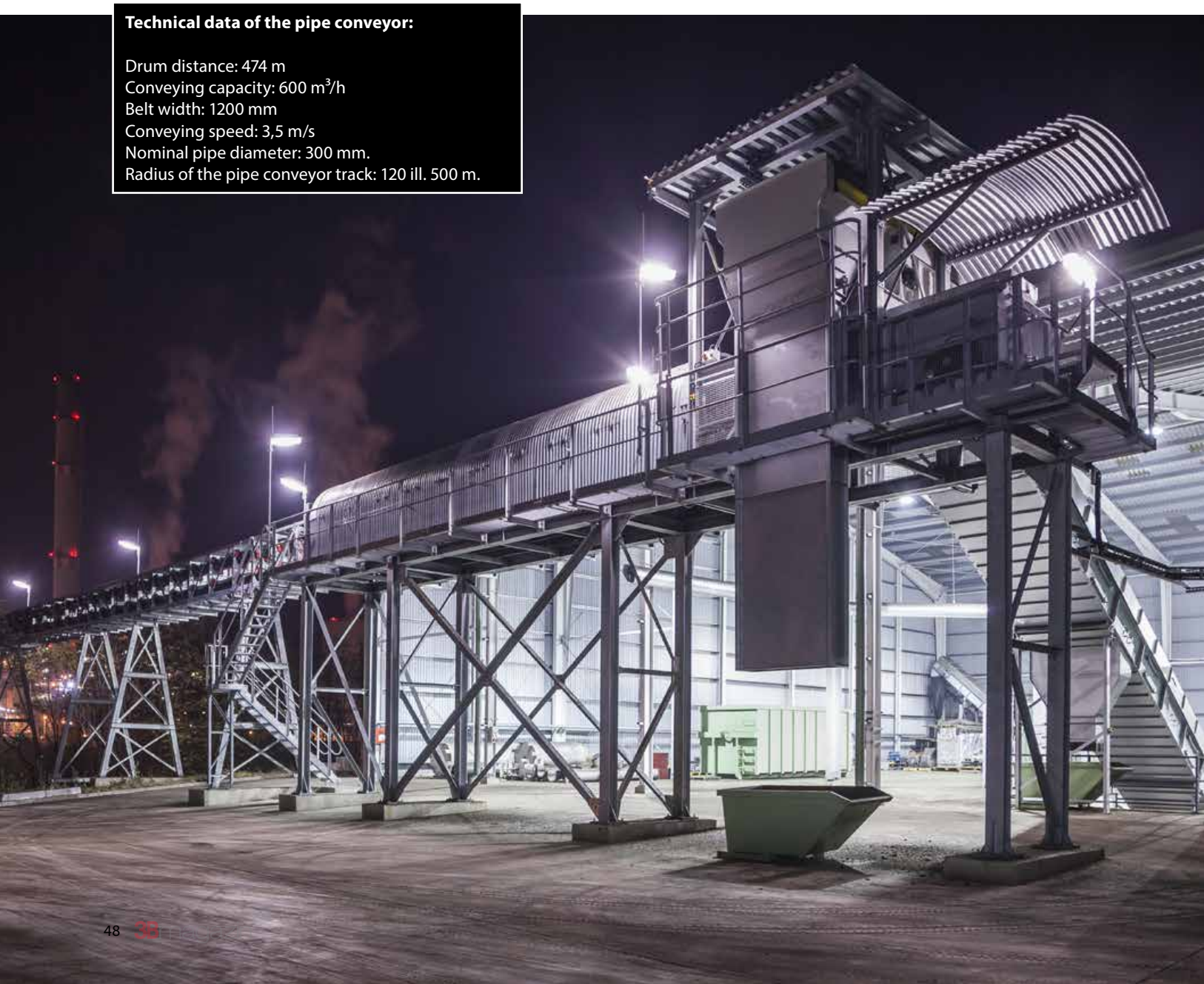
G2 Pipe Conveyor

The goal of the project which started in 2013 is to construct a receiver-feeder plant with extended capacity that would supply a wider range of materials for the **Mátra Power Plant**. On the new premises alternative fuels are received, fed and pre-treated for power plant combustion. These materials are various types of biomasses as well as pre-treated public utility waste and sewage sludge which could be all used energetically.

The pipe conveyor which links the new premises with the power plant plays a central role in this technology. After the trucks have been emptied, during the reception phase the fed material is protected by a magnetic band and a disc screen from unwanted stuff. The equipment starting from the new plant reaches the pipe bridge of the power plant after 144 metres. The first radius can be found there. An intermediary steel construction – developed specifically for this purpose – has been placed on the pipe bridge to ensure an appropriate support for the pipe conveyor. On our customer's request we had to design it in a special way so that later another pipe conveyor could be placed on it in case of further extension. Next comes a 330 m-long section on the pipe bridge towards the power plant, after a 500 m-radius curve follows the downloading on one of the conveyor belts of the power plant.

Technical data of the pipe conveyor:

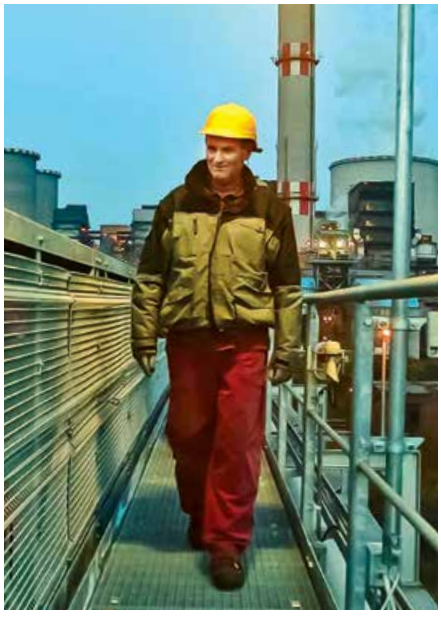
Drum distance: 474 m
Conveying capacity: 600 m^3/h
Belt width: 1200 mm
Conveying speed: 3,5 m/s
Nominal pipe diameter: 300 mm.
Radius of the pipe conveyor track: 120 ill. 500 m.



Conveyor scales were built into the pipe conveyor, at many points congestion sensors, compulsory emergency cut-out switch, rotation sensors and sensors controlling belt closure have been placed.

The signals are processed by a control system installed by 3B and forwarded to the control management unit of the power plant.

The video about this project can be watched on our website!



The assembly of the pipe conveyor was a kind of challenge for us.

Given the difficult accessibility of the area we were working on the site track with a 100-ton crane which could be mounted on 7 points along its full length.

Matra Power Plant

The Matra Power Plant Inc with premises in Visonta is a reliable pillar of the Hungarian electricity supply network. Its main profile is electricity generation. The Matra Power Plant Inc with a 950 MW capacity is the largest coal fuelled power plant in the country. The company produces electricity from lignite from its own mines with quarrying technology. The company produces 13% of the total energy consumption of the Hungarian national economy.

Alternative Solutions

Under an agreement between Márta Power Station and our client, a significant investment took place in 2007-2008, the point of which was to receive and forward alternative fuels, primarily biomass-like materials, using a site which can receive up to 400-500 tons of fuel, and which commands technologies which are suitable for present and future requirements. Previously, these had been received in the power station's coal yard, which exposed the activity to the elements.

The major aim of this investment was to save energy. Another important aspect was the utilisation of by-products and materials which were difficult to place in both agriculture and in industry. The new equipment allows the carbon dioxide quota to be set off, and it also saves fossil fuels. In the meanwhile, through burning these alternative fuels, materials which are useless in agriculture and in industry are used (which previously accumulated and were discarded as landfill).

The development on the site positively had a positive effect on deliveries, the logistics of deliveries, reception and shipment. Deliveries take place from self-emptying vehicles, with an automatic self-transporting system in completely closed conditions. The materials on the moving floor in the bunker are moved onto the conveyor belts with the help of a hydraulic system. The conveyor belts ensure the homogenisation of the materials and the separation of alien materials, while conveying 100-120 tons (600 m^3) of materials per hour.

The push floor in the bunker are moved via a Rexroth hydraulic system. 5 hydraulic machines were installed for the 5 moving ladders, which are controlled by electronic means. The speeds of parting the push floor and the hydraulic system and, to some extent, the speed of the conveyor belt, can be adjusted, thereby allowing a regulation of the amount of materials received in the power station. The system was designed so that the moving floors operate with phase-differences from each other, through which they provide continuous, steady conveyance for the power station. The requirement for the fuel which makes this possible is between 5 and 10% of the coal.

Our client plans to carry on developing the system within the power plant. At another site, meanwhile, a similar system may be installed, on the basis of the good experiences of the past 8-9 months of operation. At the planning stage of the initial piece of equipment the two major aspects under consideration were the high technical quality and operational safety. 3B, with the material conveying equipment and Rexroth, with its hydraulic system, were able to fulfil both of these requirements.

Every detail counts

We love what we do. Since the beginning we have thought that a machine should be not only good but attractive, functional and affordable as well. We have been searching the best solutions and with the assistance of a couple of selected suppliers perhaps we have reached our goals. Our modular machines work with professional performance, they have been designed for continuous, 24-hour operation in a compact form and robust design.

Safety? The most important factor. Grids, covers, sensors… everything that is needed to save human life.

Practical? The functions necessary for everyday utilisation cannot be missing. Listening to our customers' advice and experience we have been working on new ideas.

Drive station, bearings, framework, each component has got an immense significance respectively, but these all constitute the machine together.

Perfect technological solutions for our customers, that is our goal

Mining and the Construction Industry

In the mining and construction industries machines are exposed to especially heavy use. Weather, dust and heavy loads take a big toll on the equipment. Failsafe operation of them requires stable and robust design, safe technology, and solutions appropriate to the size of the task.

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