



BEUMER SYSTEMS FOR SOLID ALTERNATIVE FUELS



THE RIGHT SOLUTION FOR SOLID ALTERNATIVE FUELS

Based on many years of experience and expertise, a new milestone has been reached: To reduce costs in energy-intensive production processes and save limited resources of primary fuels like coal, oil and natural gas, the BEUMER Group has expanded its solution with new products for the reliable and economical handling of alternative fuels and raw materials (AFR) from reception to their application.

USING ALTERNATIVE FUELS

Pre-processing of waste into a high grade alternative fuel and its application is becoming increasingly attractive to reduce production costs and CO₂ emissions – especially for energy-intensive areas like the cement and lime industry. Furthermore, all organic pollutants will be destroyed in the kiln at temperatures of approximately 2,000 °C and will be absorbed by the surplus of finely ground limestone.

The use of different types of alternative fuels is governed by the availability in a given region and especially the economic aspects.

WE LEARNED FROM THE PAST

The BEUMER AFR systems are designed to meet the particular requirements of functionality and performance under the strain of daily operation.

In addition to a comprehensive supply of reliable systems for handling alternative fuels, we also focus on planning of logistics and customized conveying and warehouse systems, including crane halls, steel structures and of course turnkey deliveries of mechanical part. Due to the modular system of all design groups and system components, each project is engineered and designed individually.



Pneumatic conveying line to the main burner

THE IMPORTANCE OF FLEXIBILITY AND RELIABILITY

The alternative fuel markets are still developing. It is in the interests of the plant operator to prefer solutions which could be continually and easily customised to use the most efficient and economical fuel.

The thermal substitution rate (TSR) also has a significant effect on the overall design of the system and the components used. The higher the required and achieved TSR, the greater the need for reliable equipment, because the substitution of primary fuel is very difficult due to technological and economical aspects.

ONE-STOP SHOP

We will be happy to assist you with planning and supplying of conveying technology for the required logistics and storage systems. We can also improve and optimise your existing plant – to create a comprehensive system for optimal material handling for monitoring and co-processing of alternative solid fuels. We can draw on many years of experience and expertise in the areas of truck unloading, discharging, mechanical and pneumatic conveying, storing, weighing and feeding.

Our knowledge has been proven in the cement industry and reflects the high quality and reliability of the BEUMER AFR system technology.

COMMON SPECIFICATIONS



Residue Derived Fuel (RDF) for the Calciner

- Grain size: 50 – 200 mm
- Heat value: 15 – 18 MJ/kg
- Bulk density: 0.1 – 0.4 t/m³



Tire Derived Fuel (TDF) for the Calciner

- Size: 50 – 120 mm
- Heat value: up to 28 MJ/kg
- Bulk density: 0.6 – 0.8 t/m³



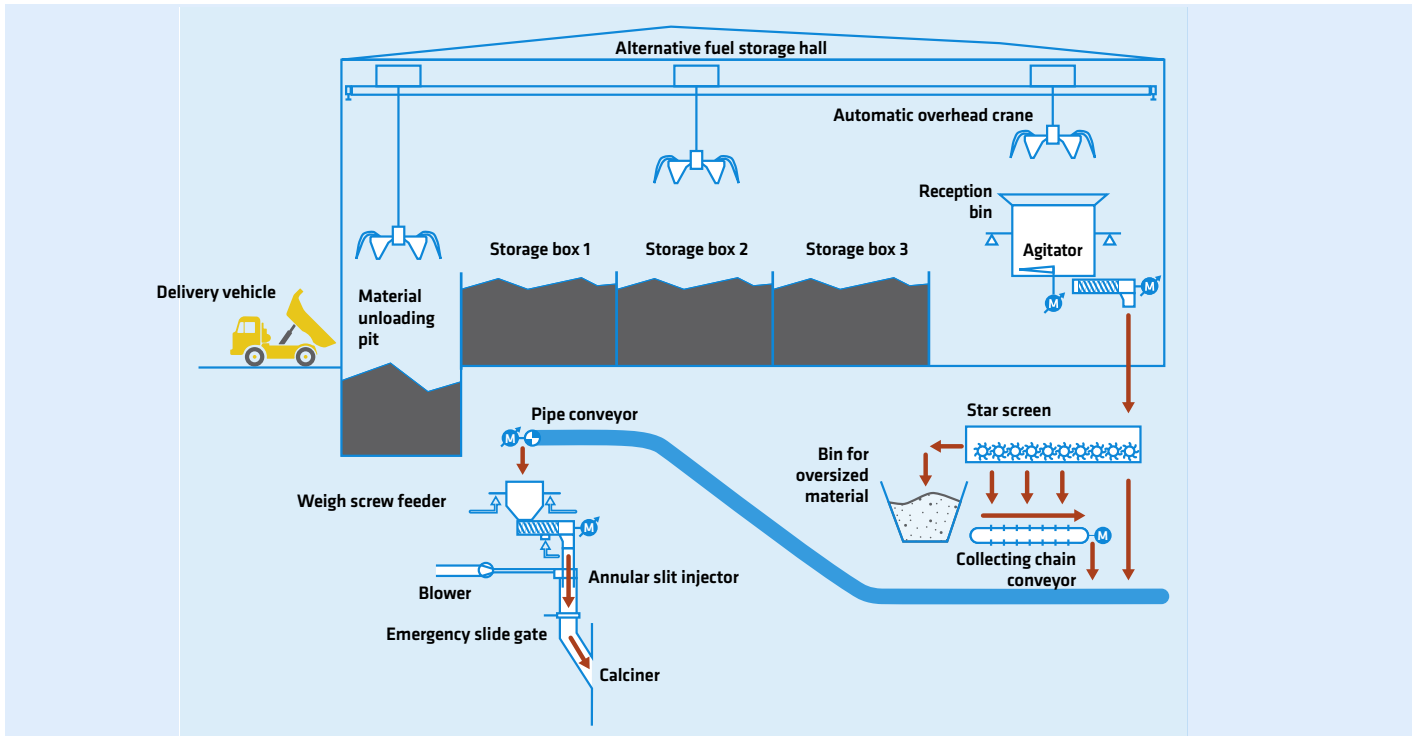
Solid Recovered Fuel (SRF) for the Main Burner

- Grain size: <15 – 30 mm
- Heat value: 20 up to 26 MJ/kg
- Bulk density: 0.1 – 0.3 t/m³

HIGHLIGHTS

- › High durability – for a long service life of all plants
- › Proven and robust solutions with regard to the varying characteristics of alternative fuels
- › Maximum operational reliability – thanks to proven, highly reliable components, machines and systems
- › Comprehensive customer-specific support – from planning through operation to service and optimisation measures
- › Everything from a single source – from a component to the entire system

DIFFERENT AFR SOLUTIONS FOR DIFFERENT REQUIREMENTS



Scenario for the RDF feeding system for calciner with crane storage hall

Different combustion processes require different fuels, which means that the conveying technology also has to meet special requirements. The BEUMER Group has therefore developed special solutions for using alternative fuels based on extensively tried and tested components.

EVERYTHING YOU NEED

The BEUMER AFR portfolio comprises the entire logistics chain, from discharging the delivery vehicle to storing, conveying and feeding the alternative fuels, which ensures a continuous replenishment of the process.

If you intend to enter the field of additional co-processing of alternative fuels, the BEUMER Group offers you reliable small systems with low equipment and installation costs and a rapid payback period. Such equipment, with a minimal stored volume, can also be used for initial testing of the suitability of that requested fuel.

BEUMER SOLUTION RANGE

- › Large facilities for achieving highest TSR
- › Small devices for initial testing of alternative fuels, their quality, behavior in the pyroprocess and emission control
- › Safe and spillage-free mechanical transport and storage, as well as reliable pneumatic transport lines
- › Customised and easy to maintain

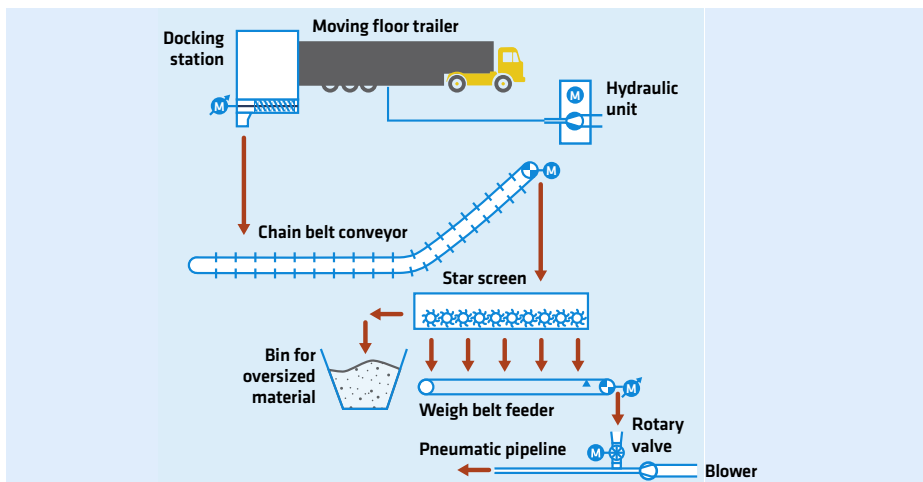


Intermediate bin with agitator and screw prefeeders

SYSTEMS FOR SMALL TO LARGE APPLICATION

The solid alternative fuel will be delivered and stored directly on the cement plant for application. However, in some cases direct firing may become an alternative solution. For both scenarios, we can analyse and draw up the user friendliest option.

Even in the initial stage a feasibility study can be executed by BEUMER specialists who are able to identify and evaluate all possible solutions from direct application to storage capacities of thousands of cubic meters.



BEUMER QUALITY

- › Proven in several of applications in continuous operation under the toughest, and in some cases extreme conditions
- › Based on nearly 80 years' experience in the development of tailored system solutions
- › Fulfilment of strictest specifications by using the best materials and latest technologies
- › To achieve high reliability, BEUMER only uses top-quality materials and components
- › Designs used by BEUMER achieve a long service life

CONVEYING AND STOCKING FOR SOLID ALTERNATIVE FUELS



BEUMER pipe conveyor

With 80 years of experience developing system solutions and 30 years of experience specifically in handling alternative fuels, the BEUMER Group offers you a complete service package that includes our expertise, plant and system technology, turnkey delivery, engineering services, and servicing if you require it.

BEUMER PIPE CONVEYORS

Alternative fuels can be transported safely, quickly and efficiently over long distances by BEUMER pipe conveyors – for example, up to the feeding points high on the burner or calciner. The enclosed design protects the environment from the transported material and prevents material losses on the conveyor route. The rugged, low-maintenance BEUMER pipe conveyor handles delivery volumes of up to 1,500 m³/h and can provide small curve radii as well as large gradient angles – while totally eliminating transfer towers.



BEUMER screw conveyor



BEUMER high-performance belt bucket elevator



BEUMER system technology for the warehouse

BEUMER SCREW AND CHAIN-BELT CONVEYORS

In the case of shorter distances of up to 15 meters, rugged BEUMER screw conveyors offer reliable transportation for alternative fuels at rates of up to 500 m³/h. The high resistance of this conveying technology to abrasion and foreign objects ensures a long service life. BEUMER screw conveyors are available with a choice of classic or shaftless screws.

For conveying distances in the range of 10 to 70 m a chain-belt conveyor is designed. BEUMER's solution meets both the requirements of resistance to aggressive and abrasive conveyed material and dust-free operation.

BEUMER TECHNOLOGY FOR THE WAREHOUSE

Alternative fuels with widely different material properties and volumes from 2,000 to 10,000 m³ can be safely handled and optimised with BEUMER system technology for discharging, homogenisation or storage. It is used for unloading all kinds of different vehicles quickly and reliably. Cranes or wheel loaders then transport the alternative fuels to the nearest processing station.

Proven lowest storage costs per cubic meter and high flexibility – these are the reasons why customers have recently prioritised the crane hall concept.

BEUMER BELT BUCKET ELEVATOR

BEUMER belt bucket elevator have proven their value hundreds of times in vertical transport applications. Belt bucket elevator are ideal for the vertical conveying of different types of alternative fuels, for example into silo type storage or for feeding the calciner in the preheater tower.

The heavy-duty belt bucket elevator is recommended for transporting lumpy, highly abrasive materials with particle sizes of up to 300 mm, which may be fed into a combustion chamber.

SYSTEM TECHNOLOGY FOR SCRAP TIRES AS ALTERNATIVE FUEL



A flat belt conveyor with corrugated side walls lifts whole tires from the ground level to the point of feeding at the preheater.

Scrap tires that cannot be recycled are best for co-processing: Natural rubber and textile carcass can be used as a fuel, whilst the steel carcass donates iron to the required clinker composition. BEUMER Group has many years of expertise and sophisticated technologies for feeding whole tires as well as chipped tires as tire derived fuel (TDF).

CO-PROCESSING TIRES

A continuously running kiln process is necessary to produce a constant cement clinker quality, which requires a continuous feeding of scrap tires as well as tire chips. An automatic handling system is recommended, due to the large quantities to be burnt without peak load.

The electrical control is equipped with a PLC. All storage and supply functions are controlled by means of photocells and sensors insensitive to dirt, dust and temperature. The drives are furnished with inspection switches so that in case of disturbances a single segment can be handled manually. The control cabinet is weatherproof and air conditioned and any errors are indicated at the control room to ensure fast troubleshooting.

SYSTEMS THAT RUN SMOOTHLY

The BEUMER Group has developed a special system technology for co-processing scrap tires, which covers the entire process from tire supply, separation, and discharging of improper tires to feeding the kiln. It ensures safe, controlled and automatic operation under the strain of daily operation.

The construction and function of the machine components are designed for all tires poured on a heap, which means that they can handle tires of different sizes, shapes, weights and amounts of impurities like dirt and water content.

Damaged tires and tires with wheel rims are rejected by means of a control device automatically. During transport, the tires are turned to get rid of that dirt and water.



A hook lifter separates the whole tires for a controlled and continuous feeding.



Whole tires can be fed easily by a wheel loader.

FROM DELIVERY TO CO-PROCESSING

After the scrap tires are unloaded, they are handled primarily by a wheel loader or gantry crane with a polygon gripper for storage and discharge. The size of the stock area has to be adapted to the kiln consumption and works as a compensation between discontinuous supply and continuous consumption.

Official permission must be obtained for setting up and operating the storage as well as for building the tire handling system, and the corresponding local regulations regarding fire-fighting and water management should be followed.

Once the tires have passed the storage and separating line, control station and weighing system, steeply inclined conveyors transport them from ground level to the defined inlet height at the preheater. The capacity and size of the incline conveyor are specifically designed in accordance with each particular project.

The whole tires can be fed through a swivel valve or triple flap. The upper and central steps open and close in order to protect the pyroprocess against heat loss and unwanted air entry. The lower step acts as a shutoff device for malfunctions. The metallic parts are protected by a highly heat-resistant coating.

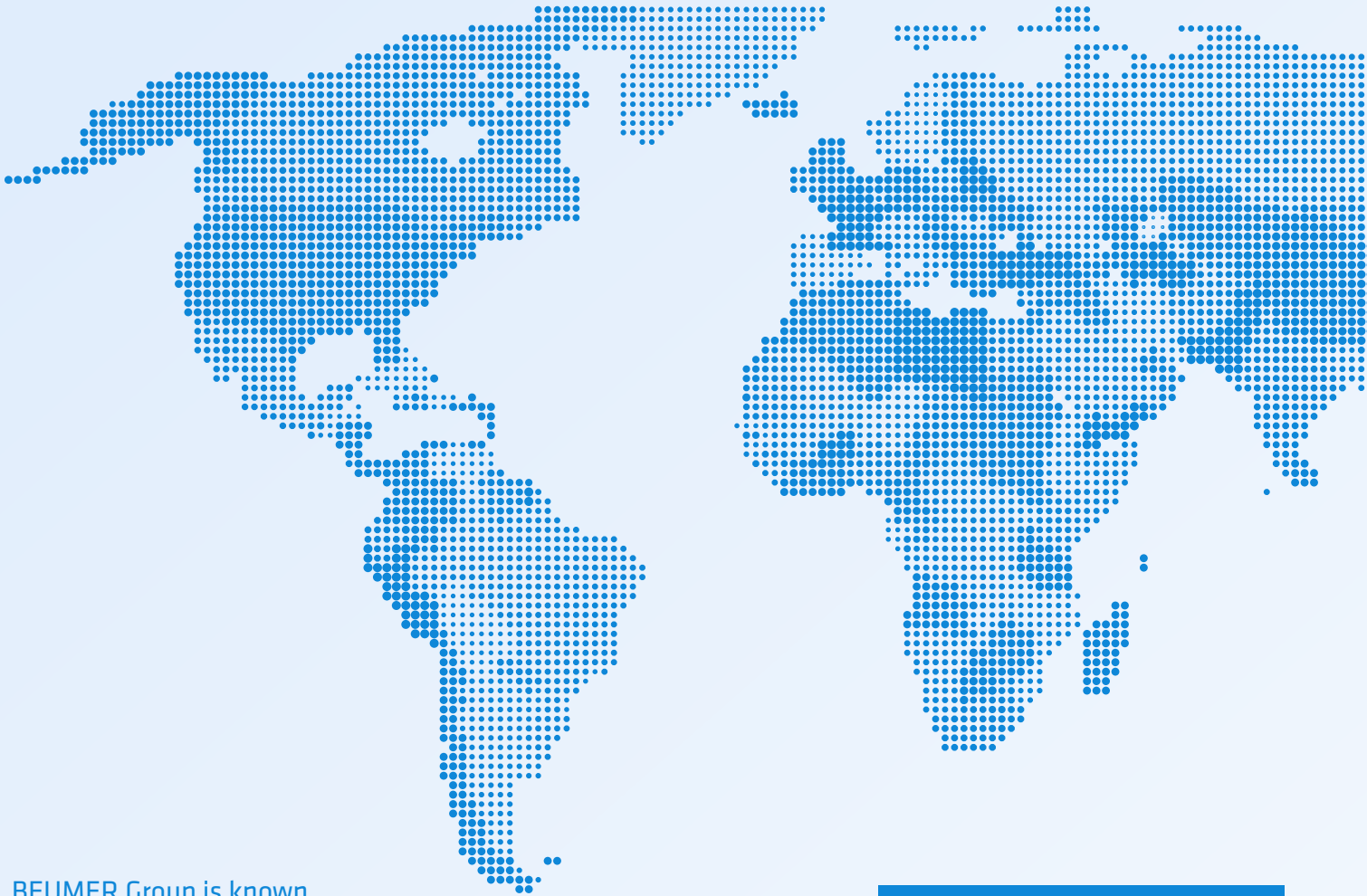
CHIPPED TIRES AS TIRE DERIVED FUEL (TDF)

The BEUMER system technology is flexible and also designed for conveying and feeding TDF for a continuous and smooth kiln operation. TDF can constantly be fed on the same path as RDF and biomass, when the longer retention time of tire chips is taken into account for proper co-processing. All modules and system components, as well as each entire project, are planned individually according to the specific process requirements.

HIGHLIGHTS

- › Cost-effective co-processing of whole or chipped tires
- › Precisely dispensed, continuous combustion processes
- › Flexible system for changing type of fuels

SIMPLY WORLD-CLASS CUSTOMER SUPPORT



BEUMER Group is known worldwide for its individually tailored customer support. This is based on a global network of regional service centres. Our support solutions will keep your systems operating – 24 hours a day, 365 days a year.

BEUMER GROUP – EVERYTHING FROM ONE SINGLE SOURCE

We also act as the main contractor on behalf of our customers providing comprehensive, highly customised concepts from product filling to palletising and packaging.

Competent engineering, fast and reliable on-site service as well as optimal spare parts supply round out our offering and ensure high reliability of the systems.



*At BEUMER Group, the focus is always on people.
We build strong partnerships through personal
relationships and individual attention.*



CUSTOMER CARE

Our customer care programme entitles you to multiple service options, such as maintenance and repair on site through our field service engineers or regular safety checks according to statutory rights. If hardware replacements are needed, our comprehensive warranty service ensures you are always covered.



MODERNISATION

We are constantly developing new ways to upgrade our software and hardware to extend a system's lifetime, lower energy costs and increase efficiency. We will keep you informed of all relevant upgrade opportunities, based on an understanding of your business and system needs.



TRAINING AND QUALIFICATION

We offer standard and tailored customer training programmes to make sure your teams are fully qualified to operate your systems. With hands-on guidance, conducted either on-site or at BEUMER Group locations, your teams can maintain optimal operational performance.



SPARE PARTS LOGISTICS

We guarantee spare part replacements around the world through our local companies. As a BEUMER Group customer, you will have your own individual contact to assist you with technical inquiries, warranty issues or repair orders and to secure that your order is delivered on time.



HOTLINE SUPPORT

Our hotline support is manned 24/7 by highly trained, multi-skilled engineers who all have at least four years of direct field experience. Most cases are solved remotely, however, should the problem require more specialised attention, a BEUMER Group engineer will be quickly sent out.



RESIDENTIAL SERVICE

With our residential service, we are on-site every day to take complete responsibility for your system uptime, performance and operational efficiency. We can take care of all maintenance and management, including system improvements, contingency plans, specialist advice and repairs.

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