

BMH Enviro

TYRANNOSAURUS® Process
SRF Fuel for Cement Kilns



SRF – Low-cost Fuel for Cement Kilns

TYRANNOSAURUS® waste processes provide a proven and effective solution for the production of Solid Recovered Fuel (SRF) for the cement industry - with an exceptionally short payback period.

Not only is SRF the cheapest fuel available, its application will also enable you to benefit from the freed marketable CO₂ credits.

The high-quality SRF processed by TYRANNOSAURUS® represents an ideal substitute for more expensive fuels such as coal, pet coke, oil, natural gas and other fossil fuels.

Turnkey Solutions from BMH Enviro

BMH delivers complete TYRANNOSAURUS® processes for producing and handling SRF to cement kilns. The systems consist of waste processing and fuel purifying systems, storage and conveyor systems as well as dryers, dosing and kiln feeding systems.

The fuel prepared in the TYRANNOSAURUS® process is suitable both for the preheater and the main burner - one single line for the production of fuel for both ends of the kiln.

BMH will provide you with all the technical solutions that you require. Our considerable expertise starts at the waste collection procedure and ends with the controlling of the flame in the kiln. By choosing BMH, you are choosing a complete service. This means delivery deadlines and project management issues will no longer be relevant.

Raw Materials

A wide range of materials that have a negative market value can be converted by the TYRANNOSAURUS® process into profit. These include commercial, industrial and domestic waste.

Furthermore, used tyres can be transformed into tyre-derived fuel (TDF) by the TYRANNOSAURUS® process. The tyre chips are easy to handle and feed into the preheater.



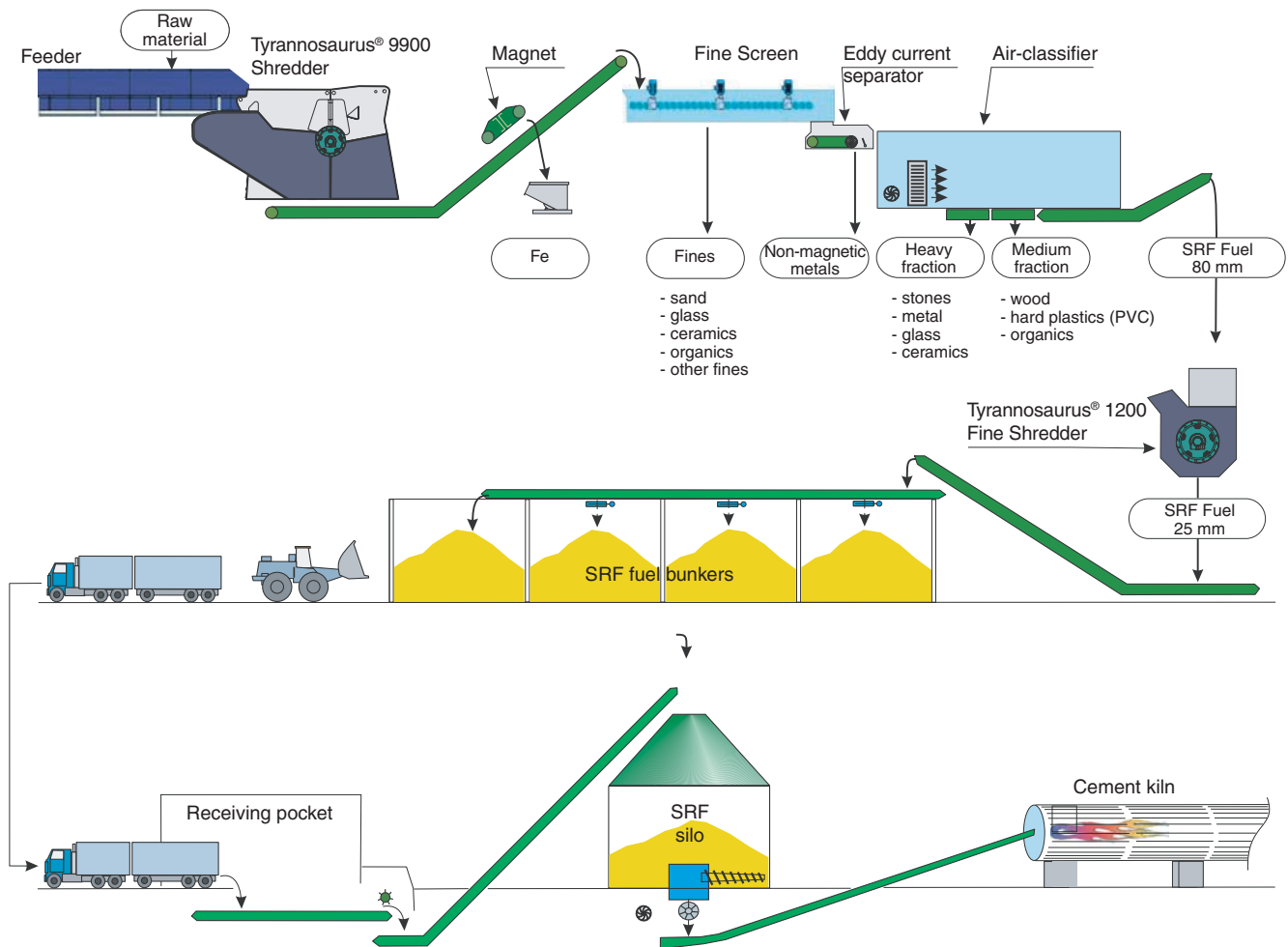
The heart of the process is the TYRANNOSAURUS® 9905 Shredder.



Integrated TYRANNOSAURUS® fuel production line



Typical raw material



TYRANNOSAURUS® SRF Process

The process typically involves a large feeder which puts raw material into the TYRANNOSAURUS® and the material is shredded into an 80 mm particle size. TYRANNOSAURUS® 9900 series shredders are in fact the world's largest waste reducers and are fully protected against unshreddable metals by the patented MIPS™ Security System (Massive Impact Protection System).

Ferrous metals are separated from the shredded material by magnets, while eddy current separators separate the non-ferrous metals. In some cases, the very fine fraction is screened out from the fuel to further improve the fuel quality.

The most important separator is the TYRANNOSAURUS® Air-classifier. This competently eliminates all materials that are unsuitable for suspended combustion. These include rest metals, glass, minerals and other inert materials, as well as wet organic materials and hard plastics containing PVC.

Finally, the light fraction is further shredded down to approximately 25 mm particle size in the TYRANNOSAURUS® Fine Shredder and at this point the fuel is ready for use.

The end product is a standardized high-quality SRF fuel consisting of predominantly PE plastic foils, paper, cardboard and textiles. The fuel is clean from both a mechanical and chemical perspective.

The entire TYRANNOSAURUS® process is virtually unmanned during operation.



An example of a complete TYRANNOSAURUS® process

SRF Fuel Properties

SRF is a homogeneous and standardized high-quality fuel that should not be considered as a secondary fuel, but rather as a primary one. In most areas, SRF is in fact cleaner than fossil fuels such as pet coke and coal due to its low sulphur and chlorine content.

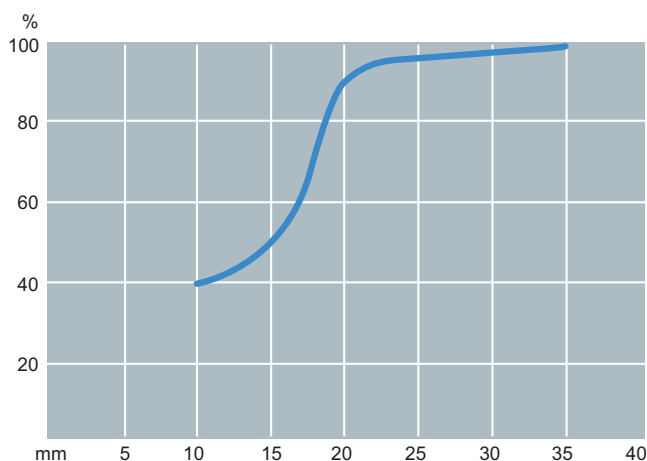
The typical net calorific value of SRF is 18 - 24 MJ/kg, equalling 4300 - 5730 kcal/kg, which is close to that of typical coal.

SRF fuel is suitable both for the preheater and the main burner. Only the preparation process may be slightly different depending on the use.

With well-processed SRF, very high substitution rates with optimal kiln operation is possible.



High-quality SRF fuel for the main burner



An example of particle size distribution when fuel is produced for burning in the main burner. Other particle sizes can also be produced by the same process.

SRF Logistics

If the SRF production plant is positioned close to the kiln, the fuel can be transported directly to the kiln by chain or tubular belt conveyors.

In cases of longer distances, the SRF fuel is usually transported by trucks. The TYRANNOSAURUS® process can be fitted with fully automatic truck docking stations or alternatively intermediate storage bunkers.

Furthermore, the SRF fuel can be compacted into plastic-wrapped Energy Cubes which are highly efficient during transportation. These are also an ideal long-term storage solution.



Trailer docking station

SRF Storage and Conveying at the Kiln

The most straightforward solution is to use truck trailers as an intermediate storage for the fuel. The truck leaves its trailer at the kiln for controlled discharge directly into the kiln through a mechanical or pneumatic system.

In addition, silos with automatic discharge can be built at the kiln. Any storage volumes required can be achieved by building a multiple silo complex.

Tubular belt and chain conveyors are used for transportation, while bucket elevators are available for vertical transport. Furthermore, in some cases screw conveyors are ideal.

All conveyor types are designed in an entirely enclosed manner to eliminate material spillage.

Dosing and Feeding

Both pneumatic and mechanical feeding systems are available. The pneumatic system includes a dosing hopper with accurate discharge control. SRF fuel is fed into a rotary valve from where it is ejected into the pneumatic system and further into the burner.

The mechanical systems include receiving bunkers, silos, dosing and flow monitoring. They are designed and dimensioned so that the kiln can receive a wide range of substitute fuels. Special attention is paid to ensuring that the flow of fuel is undisturbed and controlled.



The density of the Energy Cubes is approx. 800 kg/m³



SRF storage silos are available in sizes up to 5,000 m³



BMH Enviro

BMH Technology Oy

Kaivopuistontie 31
P.O. Box 32
FI-26101 Rauma
Finland
Phone: +358 20 486 6800
Fax: +358 20 486 6990
www.bmh.fi