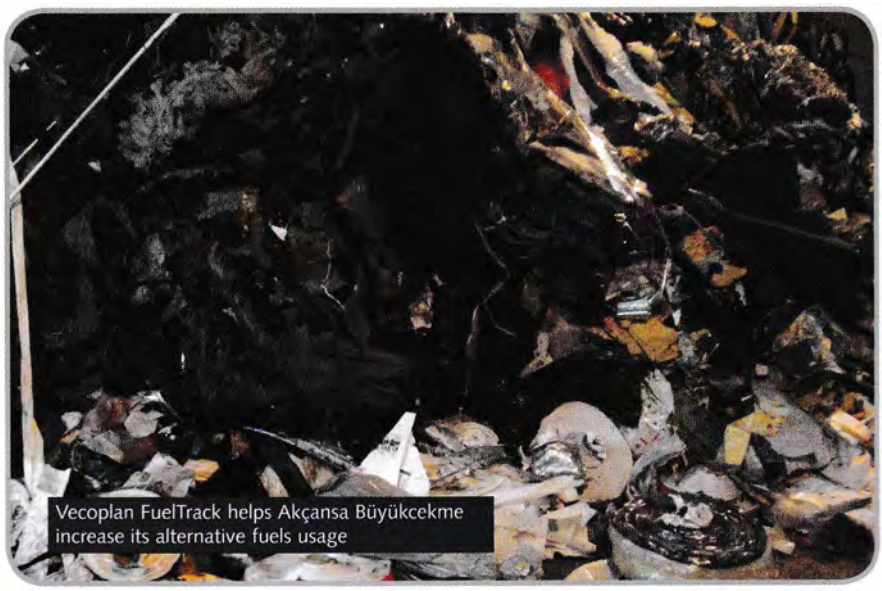
Building RDF partnerships

by Vecoplan FuelTrack, Germany

There has been a discernible and growing interest from cement plants across Europe over recent years regarding the use of refused derived fuel (RDF). When Turkish cement producer Akçansa Büyükcekmece opted to use RDF at its cement plant, it turned to the experience and know-how of Vecoplan FuelTrack to support the early stages of RDF handling and preparation.

The utilisation of alternative fuels has been one of the most important changes in cement production over recent years. However, the German cement industry was regarded with scepticism when it started to use waste-derived fuels in the mid-1980s to reduce fuel costs, which account for 30-40 per cent of modern process production costs. The rationale of replacing primary fuels was recognised by the industry at an early stage, particularly as the cement kiln provides the perfect opportunity to utilise even hazardous wastes due to the high combustion and retention times. However, local authorities and the public had to be convinced that the use of RDF was not harmful. A number of successful case studies have since proved that RDF usage not only benefits the cement producer, but also the local environment as it reduces the amount of waste sent to landfill.



Vecoplan FuelTrack helps Akçansa Büyükcekme increase its alternative fuels usage

Project scope

Akçansa Büyükcekmece made an initial enquiry into the use of RDF in 2006, one of the first from the Turkish region. Following a subsequent visit by Ahmet Somer (Somer International's representative for Vecoplan FuelTrack), it was evident that Akçansa Büyükcekmece was ready to use RDF on the main burner for one kiln.

With only a limited amount of industrial waste available at the time, the project started with a small shredder feeding a storage bin to fill the FLSmidth Pfister dosing unit. However, the lack of available waste resulted in the project being put on hold.

In 2007, the decision was to resume the project, however, this time with a different scope. Two main burners would need to be fed instead of the originally-planned one. This increase required a preparatory system with higher capacity and it was clear that the storage unit also had to be redesigned. A greater distance between the storage unit and kiln system also had to be addressed because of the increased amount of industrial waste to be processed.

Figure 1: pre-shredder

Plant specification

Key data was recorded and initial requirements for the extension formed important parts of the design criteria. Specifications included:

Equipment supplied

RDF preparation system
- pre-shredder
- airknife
- fine shredder
- separation magnet

Storage unit
- two loading and unloading devices (storage with 300m³ each)
- discharge screw (for mixing and blending out of storage units)

In addition to the various types of industrial waste, it was necessary to add a truck unloading station for a second phase. This was installed to receive additional RDF from local suppliers.

- preparation with maximum flexibility to handle various types of industrial waste using state-of-the-art technology
- a completely-enclosed storage system for different types for solid alternative fuels to minimise dust and odours
- a modular design for future expansion of storage capacities
- a storage system for simultaneous loading and discharging. This feature allows for the continuous use of RDF without additional interim storage facilities (as required for indoor cranes)
- independent storage silos so individual maintenance can be peformed while the other storage facilities are in operation
- continuous mixing and homogenisation of different fuels to maintain constant fuel quality
- a long-distance conveyor with low maintenance and spare capacity to increase future fuel rates.

While industrial waste has to be expected with most difficult single types of waste (eg, one load consisting of only carpet), it was clear from the start that a twin-shaft shredder with maximum torque would be able to meet this requirement. Therefore, Vecoplan recommended the VAZ2000 MFT 'V' with its state-of-the art HiTorque Drive® technology. This patented electric motor is designed to operate without a belt drive, gearbox or turbo clutch. Even without these parts, this drive is operated on the variable speed drive and is able to release a maximum torque of 20,000Nm for each shaft.

Therefore, it is possible to easily reduce capacity from the first shredder and deliver a constant amount of pre-shredded material to the system so operations are not frequently interupted. Running the system under a constant load also reduces power consumption, and stress on machines during start-up and stoppages. By using a so-called 'chiller', this part of the water system can cool the top drive of the VAS in a separate location, away from the dusty operating environment.

For the second device, a density separator was required for the separation and diversion of particles with a density higher than 200kg/h. Three-dimensional particles had to be removed and separated to avoid improper combustion in the preheater.

A VAZ2500RS F T was therefore recommended and ordered with:

- HiTorque Drive® technology
- floating counter knife (to absorb impact)
- preparation for rotor cooling (required in three shift operation).

The final size reduction led the customer to refer to it as one of the most advanced RDF preparation plants in Turkey.

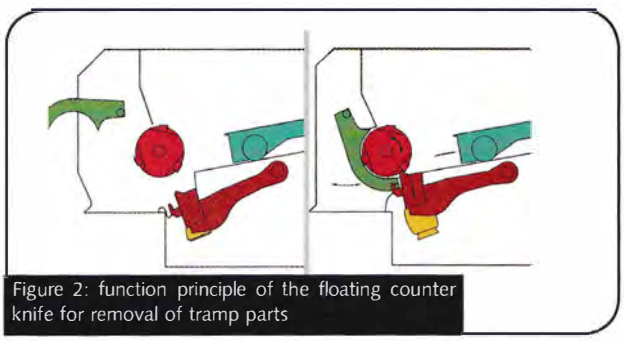


Figure 2: function principle of the floating counter knife for removal of tramp parts