

LOWER TRANSPORTATION COSTS BY REDUCING PRODUCT VOLUME

# PELLET MILL FOR FIBERS FROM SHREDDER RESIDUE CAR WRECKS

ARN Recycling in Tiel (The Netherlands) has installed a pellet mill for processing fibers out of its shredder residue from car wrecks. The pellet mill, designed and built by Dutch Milling Technology International (DMT) can economically produce fiber pellets, useful as RDF (Refuse Derived Fuel), or fuel from waste. Another step towards 100% recycling of cars.

TEXT AND PICTURES; WIL H.J. WIJNANDS

**T**HE pellet mill for the fiber processing plant at ARN Recycling in Tiel (The Netherlands) is designed, built and put into operation by Dutch Milling Technology International in Helvoirt (The Netherlands). DMT is already forty years well known for its worldwide trade in used equipment, particularly in the animal feed industry. In recent years, however, branches have been added, such as the biomass industry and the recycling sector. The company also supplies spare parts for machinery. The market for used equipment is one thing, but the construction of new machines is another story.

## New machine

According to Rogier Oerlemans, sales and service manager of DMT, the occasion for the

design and construction of its own pellet mill, were client contacts in Asian countries. "Here companies in the biomass industry increasingly prefer new machines instead of second hand equipment. So after extensive thoughts we decided to develop a machine that is versatile; suited for the production of biomass, but also deployable in the animal feed industry and recycling sector. In the recent decades we have gained much experience with other machines; as well with regard to constructions as their shortcomings. We have therefore designed a very robust machine."

## ARN Recycling

"At the same time, we happened to get in touch with ARN Recycling. This company showed much interest in our pellet mill, especially in view of their fiber processing.

agreed to run a test project which turned out to be successful. Meanwhile we are in the stage of full production."

## Shredder residue

The recycling of cars starts with demolition and dismantling companies. Here environmentally harmful substances are removed as well as re-usable parts. The wreck is then shredded and the metals are separated. The shredder residue, consisting of small metal particles, plastics, minerals and fibers, go to ARN Recycling. This company handles all automotive shredder residue produced in the Netherlands since 2011. In its factory in Tiel the material is ground, sieved and finally separated into the four above-mentioned main material flows. What is salable goes to the subsequent processor, but for the fibers the next station is the incinerator.



The new pellet press of DMT at the ARN factory



Fibers from shredder residue



Pellets as final fiber product



View in the press system of the Taurus

### Fibers

The incoming shredder residue is reduced in a variety of milling and screening steps to a fraction of 4 mm. Metals, plastics and minerals are separated. What remains is the fiber material (especially of seat upholstery), yet mixed with small particles plastics and wood. Air classifiers remove these particles; the heavy components falling down and the fibers going along with the air flow.

According to Emil Bregita, head of technical services at ARN, the fibers really are waste: "It was a bulky product to be transported to the incinerator by trucks; a costly activity. We therefore looked for a higher quality recycling process that also would yield something. We found the solution in the pellet mill of DMT. Now we process the fibers one more time in a grinding mill, after which the material can be pressed in the pellet mill. The volume decreases sharply, so we were able to reduce transportation costs by more than thirty percent."

### Robust

The new machine of DMT, the Taurus, is a pretty standard construction. According to Oerlemans the techniques used are not really new, but the pellet press is much more robust compared to the machines of competitors. This applies for instance for the heavy bearings selected. Furthermore some extras are added in response to the test results gained at the ARN plant.

### Die

Oerlemans: "In the pellet press hangs a die in which two roller shells rotate. These roller

shells take the infeed, press the fibres and then squeeze the material through the die. On the outside of the die the pellets are cut to the selected length. The machine is equipped with two motors driving the axle load dependent through ten V-belts per motor. The maximum output is controlled by the power of the engines. For safety reasons, the drive system includes a shear pin."

### Capacity

On the DMT machine 6 mm diameter pellets are made with a length of 1.5 to 2 cm. It is possible to produce 10 cm long pellets, but in the case a pellet is contaminated with iron, the pellet must be captured and a lot of product is lost. Short pellets cause less loss. The maximum capacity of the pellet mill is about 2.5 tons per hour. But so far, the machine at ARN runs at a capacity of about 1.5 tons per hour.

### Challenge

Bregita: "The challenge is that the flow and composition of shredder residue may vary. And this also shows in the fiber material. It can have more or less wood, sometimes it is dry and in other cases it is moist. All this has an impact on the achievable capacity. Furthermore, the temperature in the machine must be monitored. As a result of friction the temperature can rise up to 130°C. In order to avoid the risk of fire, a cooling water system is applied. In this game of forces, temperatures, material properties we manage to find an optimum capacity."

### Around the clock

After some initial difficulties due to the infeed



The die of the pellet press

of fibers, the machine is working satisfactorily. The pellet press by now runs around the clock in three shifts, but is still under the regime of Technical Department.

### More tests

This is because Bregita wants to run some more tests. "We now investigate a pressing process in two stages. This seems to be very promising for the quality of the pellet and the capacity of the machine. In addition, we look at the capabilities of the machine to produce plastic pellets. This is yet another stream of material which we think can make a greater contribution to operating profit." ■

More information:

[www.arn.nl](http://www.arn.nl)

[www.dmt-int.com](http://www.dmt-int.com)