

## BRIQUETTING OF STEEL-MILL BY-PRODUCTS

The K.R. KOMAREK group developed a strong experience within the steel industry to briquette various by-products in order to recycle them in the steel production cycle.

### ***HISTORICAL BACKGROUND***

The briquetting concept applied to various types of waste started in the last ten years in the United States with units operating around Chicago, Pittsburg and in Ontario, Canada. These units are operated by companies servicing the steel industry.

The concept was then developed in France with the briquetting of mill sludge. Today, K.R.KOMAREK have supplied more than 20 units to briquette:

- ▶ mill sludge,
- ▶ BOF or EAF dust,
- ▶ mill scales
- ▶ etc...

in countries like South Korea, Canada, France, Belgium, the UK.

### ***PROCESS HIGHLIGHTS***

- 1.** The briquetting system generally accepts well calibrated material below 3 to 4 mm and with a low surface moisture (below 2-3%). Consequently, the wet mixes, particularly those including rolling mill sludge, have to be pre-processed to drive off the excess moisture.

This operation is carried out :

- ▶ by thermal drying, generally in rotary kiln,
- ▶ by physico-chemical process, using CaO to absorb moisture.

- 2.** The binders generally used are molasses and hydrated lime, sometimes with cement as additive. Molasses is in liquid form and generally contains 70 to 75% dry solids. Cane molasses is usually considered as a better product than sugar beet molasses. It is added in variable proportions depending on raw material specific surface : 4 to 10 % is the normal bracket. The sugars contained in molasses combine with the calcium of the  $\text{Ca}(\text{OH})_2$  to form solid links between particles.
- 3.** Briquettes are formed in a tangent-wheel press equipped with 2 counter-rotating rolls. Their volume is usually between 30 and 80 cc and their density between 2.5 and 3.5 g/cc depending on selected formula.
- 4.** As a conclusion, the briquetting units include the following sections:

  - ▶ A raw material preparation section to obtain adequate size-range and moisture at the press inlet.
  - ▶ A mixing section to dose and homogenize raw material and binders.
  - ▶ A briquetting section with a special K.R. KOMAREK roller press, particularly adapted to abrasive products
  - ▶ Handling of fines/ashes to recycling circuit.
  - ▶ Storage section for briquettes.