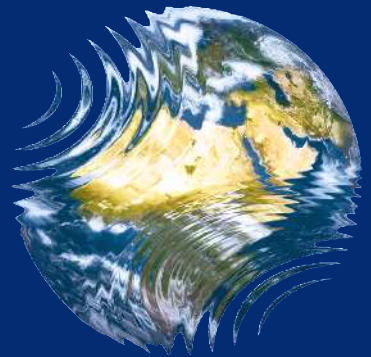




*FLOFORM™*  
*Iron Ore*  
*Pelletization*

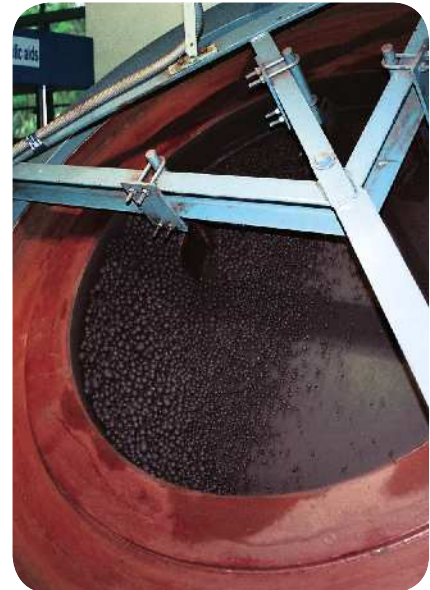
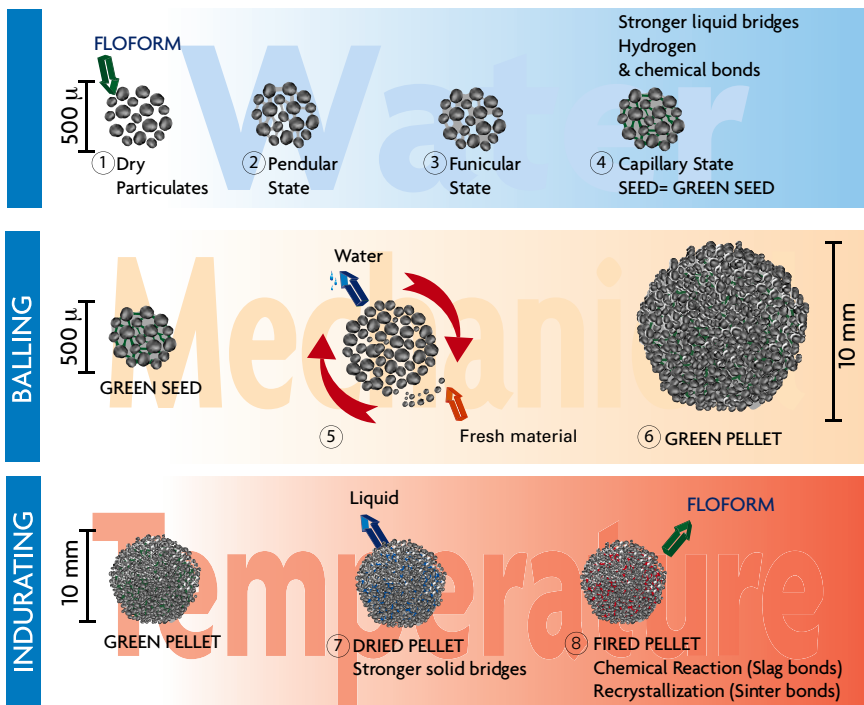


**SNF FLOERGER**

## Use of FLOFORM™

Pelletization is a tumble/growth agglomeration mechanism for solid particulates, which must comply with several key points from the strength of the liquid bond during the seeding, the control of the water migration during the balling to the solid bonds resistance during the indurating stage. Starting from these observations, **FLOFORM**, which is an organic binder based on acrylamide chemistry, has been specially developed for pelletization of magnetite and hematite ores, whatever the equipments used.

### Pelletization process



① to ③: With liquid addition, the void between the particles are progressively filled, passing by the pendular ② & funicular ③ states. FLOFORM gives strength and efficiency to the liquids bonds.

④ **Key point:** the capillary stage. All the voids are fully saturated with liquid. At the surface, concave menisci, created by capillary pressure, increase the adhesion force and the liquid bonds have the optimum strength thanks to **FLOFORM**'s action. It is the Green Seed.

⑤ During the Balling step, the mechanism is the snow balling leading to the Green Pellet. Green Seeds roll into fresh material. The rotation speed leads to migration speed of the water to the pellet's surface (centrifugal forces) and surface moisture.

**Key point:** **FLOFORM** allows to control the migration speed of the water thus the surface moisture. It can operate even with different moisture contents present inside the ore.

**Key point:** Sticky pellet surface. **FLOFORM** brings sticky properties (+/- viscous surface humidity) and enhances the efficiency of the snow balling.

⑦ Dried Pellet: the liquid inside the granule has evaporated. The strength, due to the adhesion forces created by the liquid bridges, vanishes.

**Key point:** with **FLOFORM**, the pellets have strong solid bridges, so they can be fired at the induration temperatures.

⑧ **FLOFORM** is then burned off as the chemical reactions and the recrystallization occur, the pellet are successful hardened with few gangues.

### FLOFORM™, an alternative

Traditionally bentonite is used as binder, but it reintroduces deleterious elements such as silica and alumina. FLOFORM is typically dosed at 0.01-0.05% prior to balling, i.e. about 1/20th of Bentonite. Depending on the quality of iron ore, a dual binder system comprising both FLOFORM (0.02 to 0.03%) and bentonite (0.2 to 0.33%) in the addition range could also give excellent results thus decreasing the overall bentonite consumption by 75-80%.

#### ■ Increased green ball recovery

FLOFORM promotes green ball growth and reduces the recycling rates. Increased green ball productivity, subject to furnace capacity, can therefore be achieved to maximize plant usage. Use of FLOFORM products as binder brings uniform sizing required and good shapes.

#### ■ Improved pellet properties

Green balls prepared using FLOFORM exhibit a uniform shape with a dry even surface. The pellet structure is more suited to the release of moisture, which improves thermal shock resistance and prevents spalling. The fired pellets have fewer cracks, with lower incidence of chips and pieces, and have a high CCS (Cold Compression Strength) with low AI (Abrasion Index) and TI (Tumble Index). The FLOFORM burns off during firing, yielding pellets with higher porosity and better reducibility than with bentonite.

#### ■ Lower energy consumption

The major energy saving, when using FLOFORM, will be in the furnace, where lower moisture will require less energy for the drying stage. Reduced steaming can contribute to faster heat transfer, which, combined with reduced cluster formation for better breathing. Higher green ball recovery on the balling stage also contributes to energy savings : less power is wasted on recycling of undersized material.

#### ■ Product, packaging and delivery

FLOFORM is readily miscible with the iron ore concentrate. FLOFORM is a free-flowing powder supplied in sealed 750 kg big-bags. Full details can be found on the MSDS supplied with the product.

#### ■ Process expertise and equipment

SNF's aim is to provide our customers with a total solution, from initial plant appraisal, balling test on site, and assist the Pot-grate evaluation. We look forward to discuss with you of your pelletizing application and to work with you to provide the best, most cost effective solution for your plant.

*Just look at the difference...*



**FLOFORM™ pellets**

With a clean surface  
well formed shape  
and good size distribution



**SNF SAS**  
**rue Adrienne Bolland**  
**ZAC de Milieux**  
**42163 Andrézieux Cedex - FRANCE**  
**Tel : + 33 (0)4 77 36 86 00**  
**Fax : + 33 (0)4 77 36 86 96**  
**info@snf.fr**  
**www.snf-group.com**



The information in this brochure is provided in good faith. To our knowledge it reflects the truth.