Mikołów, 30-01-2025

### ****Norm Fe Briquette****

**Briquettes Containing Oxidized Iron**

Dear Sir/Madam,

We are pleased to introduce **Norm Fe Briquette**, an innovative burden material for the Blast Furnace, produced from highly oxidized iron.

### ****Advantages of Using Norm Fe Briquette:****

✅ **Blast Furnace Cleaning** – Effectively removes deposits from the upper and middle sections of the furnace walls, enhancing system performance.

✅ **Increased Working Space** – Enables smoother gas flow, improving gas exchange efficiency.

✅ **Process Optimization in the Blast Furnace** – Our analyses show that using **Norm Fe Briquette** contributes to:

* Enhanced gas permeability and reduced gas demand.
* Increased furnace working volume.
* Reduced coke consumption.
* More stable and uniform furnace operation.
* Improved quality of the molten product.

### ****Technical Characteristics:****

✔ **Chemical Composition:**

1. **Fe Briquette**
   * **Fe (Iron):** min. 65%
   * **CaO (Calcium Oxide):** 10%
2. **FeCbio Briquette**
   * **Fe (Iron):** min. 38%
   * **Cbio (Bio-carbon):** 40%
   * **CaO (Calcium Oxide):** 5%

✔ **Form:** Oval briquette (50 × 40 × 30 mm)

Thanks to its high quality and proven benefits, **Norm Fe Briquette** is an excellent solution for optimizing blast furnace processes. The briquettes serve two key roles when introduced into the furnace burden:

### ****1. Cleaning Function:****

* The high content of iron oxides (**FeO, Fe₂O₃**) and **CaO** initiates chemical reactions with furnace deposits (mainly carbon and silicon compounds).
* **CaO acts as a fluxing agent**, lowering the melting point of deposits and transforming them into liquid slag that is easily removed.
* This process **frees up working space**, eliminating bottlenecks in the upper and middle furnace zones.

### ****2. Optimization of Gas Reduction:****

* The iron oxides (**FeO, Fe₂O₃**) in the briquettes react with **CO (carbon monoxide)** produced in the furnace, accelerating reduction to pure iron (**Fe**).
* This reduces the need for reducing gas, leading to more **efficient energy utilization**.

### ****Impact on Steel Production:****

#### ****1. Increased Furnace Efficiency:****

* The removal of deposits increases the reaction zone volume, allowing for more burden material without clogging risks.
* **Result:** Higher pig iron production per unit of time (up to **10–15% increase** over longer periods).

#### ****2. Reduced Coke Consumption:****

* **Norm Fe Briquettes provide additional oxidized iron**, which is more easily reduced than raw iron ore.
* This **lowers the need for coke** as a carbon source for reduction (estimated savings: up to **5%**).

#### ****3. Process Stabilization:****

* The **uniform briquette structure** (dimensions: **50×40×30 mm**) ensures even burden distribution, preventing uneven thermal zones in the furnace.
* **Result:** More predictable smelting operations, with **reduced fluctuations** in temperature and chemical composition.

#### ****4. Improved Pig Iron Quality:****

* **CaO content in the briquettes binds sulfur and phosphorus**, reducing their levels in the final product.
* **Result:** **Cleaner pig iron** with **fewer impurities**, improving **steel quality** in further processing (e.g., **fewer non-metallic inclusions**).

### ****Environmental Benefits:****

* **Lower coke consumption** = **Reduced CO₂ emissions** (up to **3–5 tons per 1 ton of pig iron**).
* Briquettes **can be produced from metallurgical waste** (e.g., dust from dedusting systems), supporting a **circular economy**.

### ****Technological Summary:****

**Norm Fe Briquettes** function as an **active modifier** in the blast furnace process, providing:

* **Physical benefits** – Cleansing the furnace and increasing working volume.
* **Chemical benefits** – Enhancing iron reduction and neutralizing harmful elements.
* **Economic benefits** – Lowering raw material and energy costs.

If you are interested in our product, please contact us for a more detailed presentation.

**Best regards,**  
**Wadim Wiszniewski**, Mobile: +48 605 979 222  
**Zbigniew Kotlarz**, Mobile: +48 606 951 104

[www.normastal.com](http://www.normastal.com/)