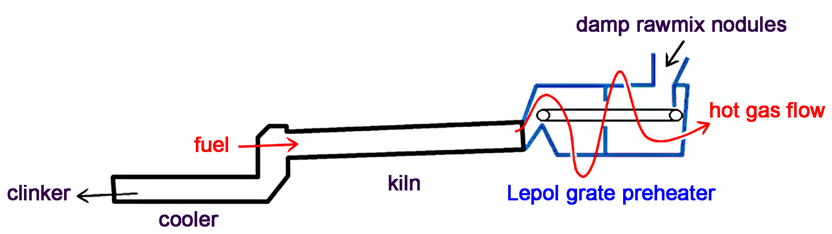
# Different technologies for Metakaolins production

## Two main processes

### Rotary kiln or moving bed

#### Rotary kiln




**Advantages**
- Robust and reliable technology (like a cement kiln)
- Thermal efficiency: 800-1200 KWh/t
- Production capacity is high: 10-12 tons/hour

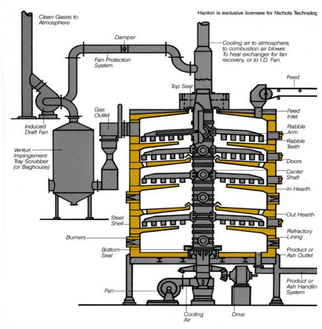
**Drawbacks**
- We do control the calcination state afterwards
- Thermal gradients inside the pellets
- Needs to be milled after calcination
- Big thermal inertia

**IMERYS France (AGS)**
- 2 kilns at Clérac
- Feed in pellets or noddles
- **Calcination cycle: 4h**
- Production 10 tons/h

**IMERYS Ukraine (VKV)**

**IMERYS U.S.**

#### Multiple-hearths calciner
*"Herreshoff type"*



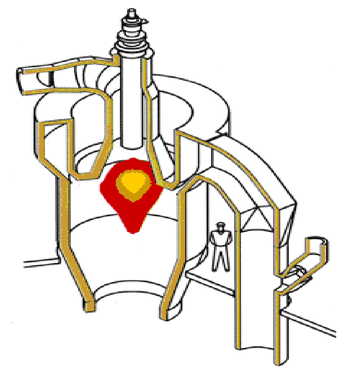

**Advantages**
- Reliable equipment
- Energy consumption is controlled: 600-1200 KWh/t
- Better control of the calcination temperature

**Drawbacks**
- The state of deshydoxylation of MK is controlled afterwards
- CAPEX is about twice the one of a rotary kiln

**IMERYS U.S.**
- **Calcination cycle: 40min to 1h**

### Flash calcination

#### Flash calciner

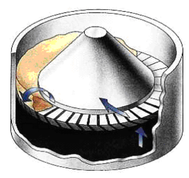


**Advantages**
- Quick to start and stop
- Better control of the temperature and of the MK state
- Limited consumption of energy: 400-800 KWh/t
- Good capacity related to the size of the kiln

**Drawbacks**
- Complex system
- Quite high initial CAPEX

**IMERYS France (AGS)**
- 1 kiln at Clérac
- Kaolin is milled before input
- **Calcination time: 1s**
- Production 1 ton/h

#### Torbed calciner



**Advantages**
- Quick to start and stop
- Better control of the MK state
- Good control of the temperature

**Drawbacks**
- High energy consumption: 1000 to 2000 KWh/ t
- Expensive maintenance costs and high initial CAPEX

**IMERYS U.K.**
- **Calcination time: 1s**

## Range of Imerys Metakaolins

| Metakaolin | d50 | Production | Kaolin source | Reactivity | Whiteness | Specific surface area (BET) |
|---|---|---|---|---|---|---|
| **MK40** | 20 µm | Ukraine | Secondary | ++ | + | 15 m²/g |
| **Argical M1000** | 10 µm | France | Secondary | ++ | ++ | 18 m²/g |
| **Argical M1200S** | 2 µm | France | Secondary | +++ | ++ | 23 m²/g |
| **Metastar 501** | 2 µm | U.S. | Primary | +++ | +++ | 14 m²/g |
| **Argical M50S** *(liquid)* | 1 µm | France | Secondary | +++ | | 23 m²/g |

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