A new concept in cyclone technology
More capacity – less energy
FLSmidth’s new counter current cyclone (CCX) delivers cement plant owners greater opportunities to reduce initial installation expenses and improve plant operations. Leading the way as the next generation of top-stage cyclone technology, the FLSmidth CCX is designed to make the preheating process more economical.

**Greater operating efficiency**
One of the CCX’s ground-breaking technologies is the counter current heat exchange concept. Developed by FLSmidth, this reduces operating costs by combining efficient heat exchange and effective separation of dust and air into one process. Unlike conventional cyclone designs, material exits the CCX cyclone at a higher temperature than the exit gas. For retrofits, this delivers two main advantages:

- Net. heat consumption reduced by 8-10 kcal/kg clinker
- Less than 50% pressure drop compared to same standard cyclone diameter

**Lower capital costs**
For new preheater projects, the CCX cyclone decreases initial costs of the preheater structure and installation time – while maximising production capacity. This is due to the cyclone’s larger capacity and a new, lighter lining concept, which allows the cyclone to be lined before being lifted and installed. Furthermore, installation is simplified as the acting loads are more than 50 percent lower than a conventional cyclone of the same size.

The CCX cyclone’s improved heat transfer efficiency means it is often possible to reduce the number of cyclone stages. For example, a four-stage preheater will often be possible instead of a five-stage preheater, resulting in lower combined operating costs for fuel and power as well as significant capital cost savings.

**A new perspective on upgrades**
Upgrading a preheater to more efficient technology can deliver compelling commercial benefits. But upgrades have often been out of reach for plant owners, typically because of excessive civil and structural costs, installation difficulties, and the impact on plant layout. The FLSmidth CCX enables owners to meet these challenges, thanks to its unique concept – which makes upgrading a highly attractive economical proposition.

For conventional preheater technology, it is especially the construction height than can escalate costs. Upgrading to the CCX does not require any reinforcements to the existing preheater structure, despite the larger size of the cyclone. For owners, this means the ability to boost their preheater operations, but at a lower capital cost.

**Key benefits**
- Lowest civil and structural costs of new preheaters
- Lowest operating costs
- Low installation costs
- Lightweight construction
- Fast, simple installation
- High flexibility for retrofits and upgrades
The FLSmidth CCX top-stage cyclone combines FLSmidth’s process and cement production know-how with industry requirements for reliability, power and heat efficiency and low installation cost. Several fundamental design features contribute significantly to its outstanding performance:

- **Raw meal feed inlet**: Material and gases are then processed naturally by gravitational and centrifugal forces in the cyclone.
- **Rotating spreader**: A rotating spreader disperses the raw meal into the gas stream ensuring efficient counter current heat transfer and separation.
- **Upward-facing central pipe**: The cyclone cannot be filled with dust during a stop, which reduces material loads on the preheater tower by 50 percent – making it possible to install a much larger cyclone within the existing structure for retrofits.
- **Lightweight lining concept**: The slim lining concept reduces the weight of the lining by approximately 60 percent compared with conventional top-stage cyclones. It also reduces heat loss and pressure loss by allowing more effective use of the volume in the cyclone.
- **Downward-facing exit gas outlet**: Changes in flow direction typically seen in conventional top-stage cyclones are avoided, leading to a reduced pressure drop as the work required to lift material is eliminated.