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## Catalyst & Zeolite Processing

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The ability of the TORBED reactors to carry out precise calcination and heat/mass transfer processes has allowed the development of unique process plants. The ability to control strong exothermic reactions allowed the regeneration and recovery of catalysts and zeolites to be carried out faster and with greater precision. The precise temperature control achieved in endothermic calcination of catalyst substrates produces higher surface area support structures and more reactive catalysts.

There are several application areas where TORBED reactors are already utilised including:

- Catalyst manufacture
- Catalyst regeneration
- Catalyst recovery
- Zeolite regeneration

### Catalyst Manufacture

The ability to dry and precision calcine the catalyst substrate presents exciting opportunities, particularly in the generation of higher surface area support structures. TORBED reactors have been in commercial use since 2001. In the production of mineral based substrates, an increase in particle surface area of 10 times has been routinely achieved. Torftech has also provided their technology to aid users for the development of new catalysts.

### Catalyst & Zeolite - Regeneration & Recovery

The removal or stripping of Volatile Organic Compounds ('VOCs') from catalyst and the control of the combustion of surface carbon and sulphur is best achieved in a TORBED reactor. The precise temperature control, and gentle physical handling afforded by the TORBED concept allows greater precision in processing. This close process control minimizes damage to the catalyst due to uncontrolled combustion.

TORBED reactors have been in commercial use for catalyst regeneration since 1997. The surface area, shape and reactivity of the catalyst are retained but with higher throughputs than was possible previously.



**Catalyst Processor During Assembly**

Catalyst recovery is applied to catalysts no longer regenerable due to physical or chemical degradation. These are processed in multi-stage TORBED Reactors to remove carbon and volatiles prior to hydrometallurgical or pyrometallurgical metals recovery processes. A TORBED reactor has been in use since 2000 preparing spent catalyst for a leach recovery process. As the prices for metals used in catalyst manufacturing continue to rise, recovery will become an increasingly attractive commercial opportunity.

The removal of VOCs from mineral matter, particularly where there is a large exotherm potential, is well controlled and precise utilizing a TORBED Reactor. This precision enables faster and less energy intensive commercial operation to be achieved.

A TORBED CBR has also been used for removal of water from zeolites used in drying of slurries.

TORBED Reactors are co-current heat transfer devices that have similar characteristics to fluidised beds. However, their very low pressure drop compared with fluidised beds allows multistage operation creating near plug flow processes. TORBED Reactors are smaller, cheaper and are usually factory assembled and tested.



**A Catalyst Processor is hoisted into position**

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