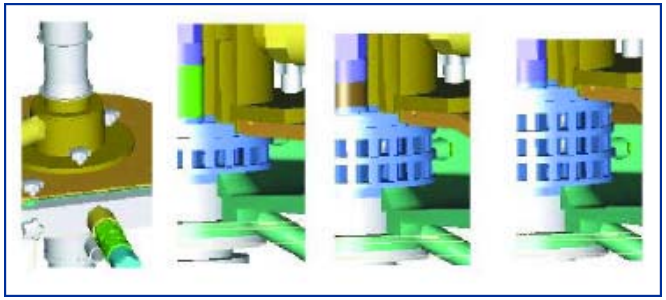
## Technical Specification

### The Pharmill Classifier Spiral Jet Mill

Pharmill Technology Ltd. is a joint venture company of Atritor Ltd & PMT Jetmill GmbH. Together we have developed a new concept in pharmaceutical micronising, the Pharmill CSJ1-2-3, a spiral jet mill with internal classifier wheel. The unique feature is that, by changing the mill top cover, 1, 2 or 3 classifier wheel modules can be mounted in the same mill body as shown below, doubling the mill capacity factor each time. With 1 classifier wheel module the Pharmill will produce typically 4kg/h, suitable for R&D work, with 2 classifier wheel modules, 8kg/h suitable for pilot scale work, and with 3 modules, 16kg/h, ideal for small scale production.

CSJ1-2-3 Classifier Spiral Jet Mill.

3 module classifier assembly for R&D, pilot scale and small scale production i.e. capacity 4, 8, & 16 kg/h.





Food & Pharmaceutical Technology

Atritor can provide a totally integrated process plant design service for the food and pharmaceutical industry. This includes design, manufacture, supply, installation, commissioning and validation, for milling, micronising, classification, containment and ancillary equipment.

Single machines or complete turnkey systems can be provided. For explosion protection typical options are nitrogen inerting, either straight through or recycle, 10bar pressure resistant design, or suppression. For non-toxic materials venting is an option.

For process control/quality assurance, Atritor can offer real time process monitoring by on-line measurement of product PSD. Opposite is the Malvern Insitec on-line optical laser analyser located in the mill discharge pipe and sampling milled product giving instant readout of PSD.

## Mill System Cleaning

Mill system cleaning is always an important issue in pharmaceuticals and the method is usually influenced by:

- Mill geometry
- Type of deposits (light powder or hard build-up)
- Material solubility.

The common regimes for cleaning mill systems are:

- Manual disassembly and cleaning
- WIP (wash in place) followed by manual intervention for finish cleaning
- Full CIP (cleaning in place)or CIP & SIP (sterilising in place)

Atritor can design process systems to include these options. Product contact gaskets and seals are FDA compliant materials. Bearing seals can be gas purged to satisfy containment and contamination issues.

When processing pharmaceuticals, product toxicity, the resultant OEL (operator exposure level) figure and room classification will determine the level of operator protection required during plant operation, cleaning and maintenance. Where containment of our equipment is necessary for either product or personnel protection, we can provide a variety of solutions, including downflow booths, gloveboxes and isolators.