

3. Machines

3.1 Grinding

Hosokawa/Micron Pulvis PV

Agitating Media Mill with an Integrated Classifier

Summary

The Pulvis was developed as a dry type energy-efficient ultra-fine agitating media mill with integrated classifier.

To obtain particles of sub-micron size with impact type mills or jet mills very large milling energy is required. On the other hand, media agitating mill such as ball mills is possible to grind down to sub-micron range with energy saving features, however, problem was that the particle size distributions is rather broad.

To solve this problem by integrating a classifier in the agitating media mill it is now possible to continuously produce submicron size particles.

Principle of Operation

The milling part is located at the bottom of the machine. Feed material is ground by agitated media that combine impact grinding and attrition. Here, media surface covered with particles receive impact, compression, shear and attrition effect. Therefore effective grinding with less energy can be done compared to impact type mills.

The ground particles are conveyed via the gas flow injected from the bottom side to classifying zone, and only the particles finer than cut point passes the classifier and collected as products. Coarse particles are descends down to milling section and re-ground.

Since the grinding by media agitation and the classification by air stream is simultaneously done under dry conditions, drying process can be eliminated and thus there is no agglomeration problem, which is different to the case of using wet media agitating mill. The product contact part such as grinding media, casing, and classifying rotor can be manufactured in ceramics to minimize the metal contamination in the product.

Features

- Energy efficient
- Possible to grind down to ultra fine particles(sub-micron)
- Easy particle size adjustment
- Ceramics construction possible for powder contact part

Applications

- Ceramics such as glass, silica
- Battery materials such as iron phosphate
- Minerals such as iron ore



Fig.1 Pulvis PV-1000

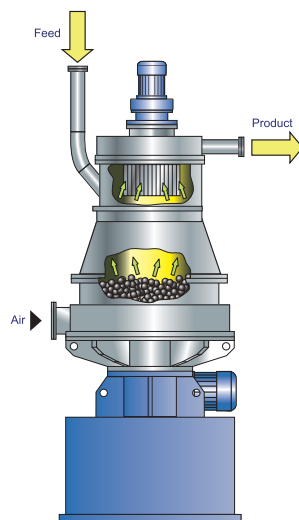


Fig.2 Structure



Fig.3 Classifying wheel made of alumina



Fig.4 Grinding chamber