

Case Study 01

Enhanced Quality Granules

Consultant: Prof Mike Hounslow & Prof Agba Salman (University of Sheffield)

Technology

Granule 'Quality' can be defined in a number of ways including consistent size, shape, porosity and strength. This technology enables the production of granules with highly reproducible properties, possessing:

- ④ Tightly defined, mono-modal, size distribution (see figure 1)
- ④ Homogeneous porosity and binder, providing consistent physical properties such as strength



R = 0.97, Span = 0.39

R = 0.89, Span = 0.63

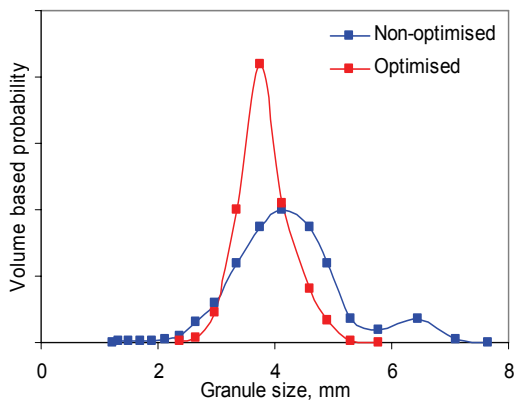


Figure 1: Size distribution and roundness, R.

Benefits

There are a number of benefits to manufacturing a particle using this granulation method:

- ④ Able to produce highly uniform granules, 'as if from the same mould'. This means, typically, that the standard deviation of the size distribution can be halved
- ④ Uniform granules are particularly desirable as building blocks, when being combined into larger shapes or structures, providing:
 - more uniform microstructure
 - reduced vulnerability to distortion and breakage
- ④ Porosity variability from granule to granule can be reduced typically from $\pm 20\%$ to $\pm 5\%$, giving more consistent granule strength, dissolution rates, etc.
- ④ Granules so far have been produced with median sizes from 400 μm to 4 mm

Potential applications

- ④ Granules as an end product:
 - Consistent pharmaceutical granule size and dissolution characteristics (e.g. for capsules)
 - Regular animal health granules (e.g. for worming)
 - Uniform zeolite catalyst (fluid beds, etc)
 - Sweet/confectionary micro-granules
- ④ Granule aggregates, where uniform and repeatable microstructure is required:
 - Uniform pharmaceutical granule 'building blocks'
 - Avoid pigment brick breakdown during firing
 - Manufacture of Cermet sheaths and refractories

ParticlesCIC

Houldsworth Building ●
Leeds ● LS2 9JT ● UK
Tel: +44 113 343 2376 ● Fax: +44 113 343 2377

www.particlescic.com