CLAIMS

What is claimed is:

1. A method comprising, for a particle size distribution (PSD) of a plurality of particles of a nonuniform solid phase material, wherein the PSD is for a group of particles having a volume percent equal to 100 vol%, removing a top volume percentage and a bottom volume percentage from PSD to obtain a true PSD; wherein the top volume percentage comprises the particles in at least the highest 0.5 vol% of the particles of the PSD and the bottom volume percentage comprises the particles in at least the lowest 2.5 vol% of the particles of the PSD;

wherein the method further comprises calculating a numerical value representing the modality of the true PSD, wherein the numerical value is calculated using the equation Z equals kurtosis minus the square of the skewness, wherein the kurtosis and the skewness are calculated for the true PSD;

wherein the PSD and the true PSD are determined by a particle size analyzer.

2. The method of claim 1 wherein the top volume percentage comprises the particles in at least the highest 0.25 vol% of the particles of the PSD and the bottom volume percentage comprises the particles in at least the lowest 2 vol% of the particles of the PSD.

3. The method of claim 1 or 2 wherein the particulate solid phase material has a PSD that is unimodal or bimodal.

4. The method of any one of the preceding claims wherein the particulate solid phase material comprises an inorganic material.

5. The method of any one of the preceding claims wherein the particulate solid phase material comprises a catalyst.

6. The method of any one of the preceding claims wherein the material comprises a catalytic material spray-dried on a particulate solid phase filler.

7. The method any one of the preceding claims further comprising selecting the particulate solid phase material for use in a manufacturing process for making a manufactured product, wherein the suitability of the particulate solid for use in the manufacturing process is based on the Z-factor.

8. The method of any one of the preceding claims wherein the Z-factor value of the particles is at least 2.7, or at least 2.8 or at least 2.9.

9. The method of claim 7 wherein the particulate solid comprises a Ziegler-Natta catalyst spray-dried on a particulate solid phase filler, the manufacturing process comprises polymerizing ethylene or copolymerizing ethylene and an alpha-olefin in the presence of the catalyst in a gas phase fluidized bed reactor.