

PRODUCT DENSITY AND SIZING

Incitec Pivot manufactures and imports fertilisers, from various suppliers.

Typical density and sizing data for the more commonly used products is shown in the following table.

These can vary between manufacturers/suppliers and over time, and consequently may differ from the stated values.

Measurement	Product										
	Granular Urea	Cal-Am	Gran-am	DAP	MAP	Granulock Z	SuPerfect		Muriate of Potash	Sulfate of Potash	Nitrophoska Special
							Geelong	Portland			
DENSITY											
Specific Gravity	1.33	2.0	1.77	1.62	1.80	1.85	2.3		2.0	2.66	NA
Bulk Density (kg/m ³)	700 - 800	950 - 1 150	800 - 1 000	900 - 1 100	900 - 1 100	900 - 1 100	1 100 - 1 300		1 000 - 1 200	1 200 - 1 400	1 000 - 1 200
SIZING											
Size Guide Number	300	375	265	300	300	300	340	270	300	295	385
Uniformity Index	55	55	50	60	60	60	45	35	50	55	35
Typical Sizing (%)											
Undersize (< 2 mm)	2	0	10	2	3	1	3	19	6	5	0
Target (2 - 4 mm)	92	70	84	94	94	94	70	69	88	90	63
Oversize (> 4 mm)	6	30	6	4	3	5	27	12	6	5	37

DENSITY

The **Specific Gravity** measures the weight of individual granules, and compares this with water, which is ascribed a Specific Gravity of 1.

As such, it is a ratio, and has no units.

The **Bulk Density** is the weight of the product in a given volume, e.g. kg per cubic metre (m³) or kilolitre (kL).

It takes into account the space/air between the granules, and is typically about 50 - 60% of the Specific Gravity, when expressed on a volumetric basis.

SIZING

Fertilisers that are uniform in their particle size have more consistent flow rates, and are less prone to segregation when used in blends. With this in mind, most fertiliser manufacturers aim to produce fertilisers in which the majority of granules are in the 2 to 4 mm range.

Size Guide Number (SGN)

The Size Guide Number is the diameter of the “average particle” in millimetres (mm) multiplied by 100.

The average particle size of a fertiliser with a SGN of 300 is 3 mm. 50% of the particles will be retained on a 3 mm screen, 50% will pass through it.

UI (Uniformity Index)

The Uniformity Index is a method of determining how consistent the granule diameter is. It compares the particle size at which 95% of the fertiliser is retained on a screen, divided by the particle size at which 10% is retained (and 90% passes through the screen), multiplied by 100.

The higher the number (UI), the greater number of particles that are close in size to the SGN. A UI of 100 means all the granules have the same size.

A Uniformity Index of 50 means that the average diameter of the small particles is half that of the large particles.

A UI of 50 is considered to be good.

ANGLE OF REPOSE

Most granular and prilled fertilisers have an angle of repose of around 35°.

This varies with the type of fertiliser, granule size and shape, and quality (presence of fines and dust).

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