

# GREENSPERSE CA-N

## Binder for applied granules (GR)

Greensperse® CA-N is a superior and versatile binder for applied granules (GR). It facilitates optimal processability and provides improved strength and durability of granulated products. It can be used with pressurised and non-pressurised processes. Greensperse CA-N contains different functional groups that enable it to adhere to a wide range of particle surfaces. It is applicable for use with a range of powder qualities having highly diverse surface characteristics.



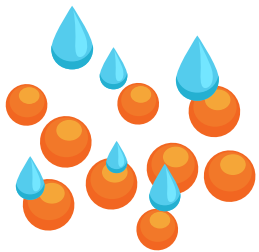
## PURPOSE

Give an example on how Greensperse CA-N works as a binder for applied granules produced by pan (disk) processing.

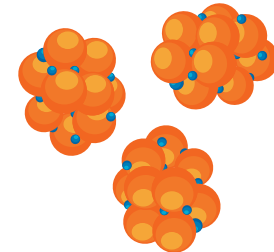
## RESULTS

Greensperse CA-N is robust and versatile binder that is easy to handle and blend. Its binding properties are demonstrated on two substrates to show how it can help produce low dust granulated products for soil and aqueous applications. A crush strength of approximately 25 N/mm<sup>2</sup> was achieved at approximately 3,6 % (w/w) binder dosage on the substrates tested.

Binder drops



Powder



Final agglomerates



## PROCEDURE

Greensperse CA-N is water soluble at all pH ranges and is efficient for use with pan and drum agglomeration and with pressurised processes like roll compactors, pin mixers, extruders, tablet presses and pellet mills. The binder molecule contains hydrophilic and hydrophobic sites that become functional in the presence of moisture.

In this example a pan (disk) granulator was used for granulating two different powder materials (substrate I and substrate II). Granulation trials were performed by spraying a liquid solution of Greensperse CA-N onto the powder (substrate) that had been pre-wetted and mixed with the same binder solution just before the granulation process. Binder addition was in the range of 1.9 – 3.6 % (w/w).

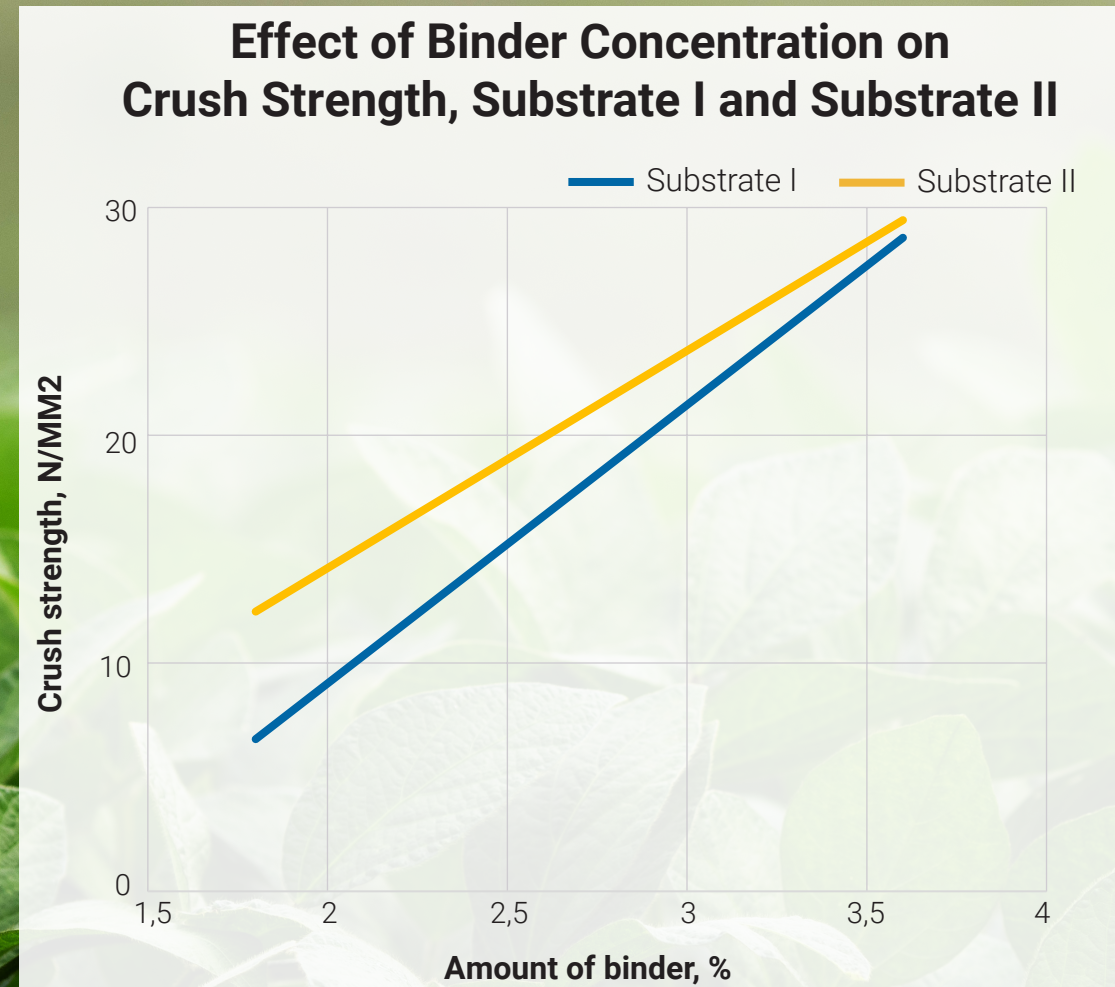
The granules were then dried at 140 °C for 1 hour and sieved to obtain the fraction having a granule size between 2.8 – 3.15 mm. Crush strength of the granules were then measured.



## DISCUSSION

Liquid solutions of Greensperse CA-N at dry matter concentrations ranging from approximately 12% to approximately 30% (w/w) were tested. Half of the binder solution was mixed with the powder just prior to granulation. The other half of the binder solution was sprayed on during the granulation trial. The data reported here were obtained from the trials performed with the 30% (w/w) binder solution.

In these trials it was observed that a pre-conditioning of the powder was beneficial. Approximately 200 g of binder solution was applied to 2.5 kg of powder, before another 200 g of binder solution was applied during the granulation process. A more homogenous size distribution of the agglomerated material was achieved, and the crush strength improved when applying this procedure.



## CONCLUSIONS

Greensperse CA-N has positioned itself as a benchmark product for achieving better strength and durability of granulated products. It can be used with pressurised and non-pressurised granulation processes. Greensperse CA-N contains several different functional groups and will, therefore, bind a broad range of substrates having highly different surface characteristics. Greensperse CA-N is a bio-based product having natural binding properties.

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### Greensperse CA-N provides several benefits

It is suitable for pressurised and non-pressurised agglomeration processes

It provides increased strength and durability to the granules

It is applicable for substrates having highly different surface properties

It is a bio-based product that is safe to handle