

The background of the slide features a collection of various food ingredients including cinnamon sticks, coffee beans, cocoa powder, chocolate pieces, and nuts, all arranged on a light blue reflective surface. A semi-transparent blue rectangular box is overlaid on the left side of the image, containing text and decorative white circles.

## HIGH SHEAR MIXER, EXTRUDER & SPHERONIZER

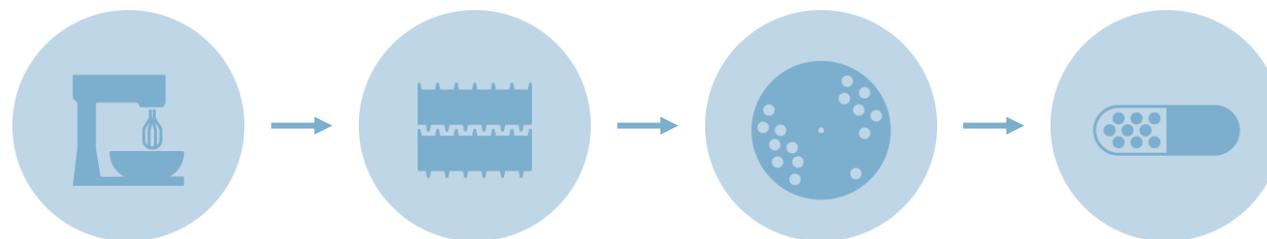
Patrick Gabler, Gabler  
Andre Duwendag, DIOSNA



# Agenda

High shear mixer, Extruder & Spheronizers for the food and pharmaceutical industry

- P1-6 High shear mixer
- Extruder DE40
- Spheronizer R250
- Fluid bed dryer/coater Minilab RC

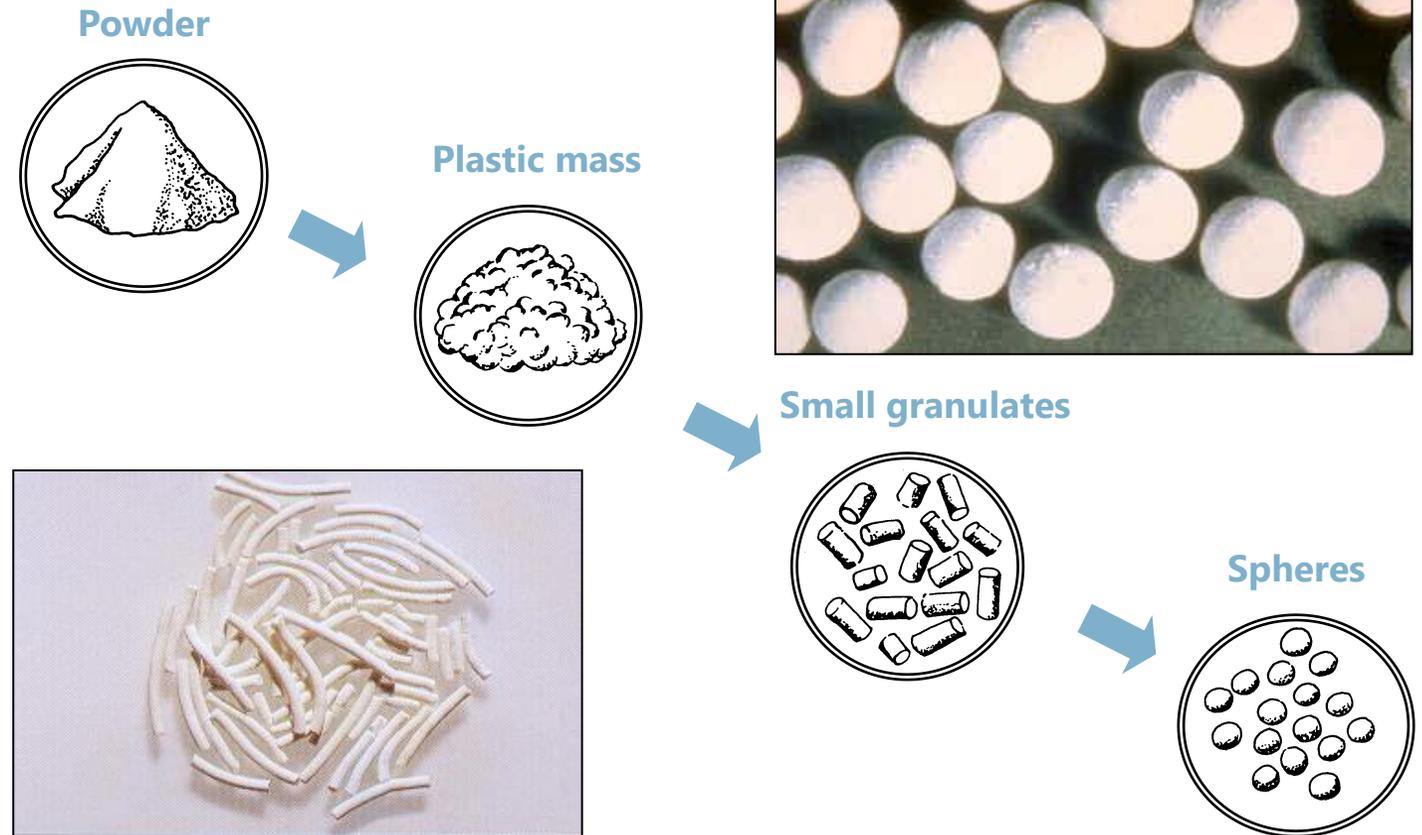




# Lines for pharmaceutical pellets

## Process Steps

- Mixing of dry powder and moisturizing
- Dosing
- Extruding
- Proportioning
- Spheronizing
- Drying
- Sieving



# ➤ Mixing in DIOSNA Granulator

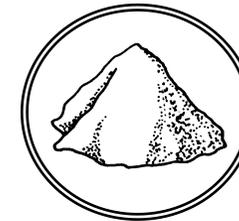
## Process Steps

- Mixing of dry powder and moisturizing

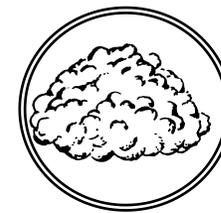
## Placebo Recipe

- Lactose 60%
- MCC 40%
- + 50 % water

Powder



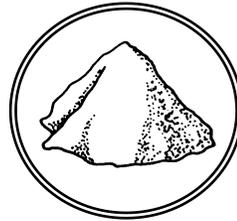
Plastic mass



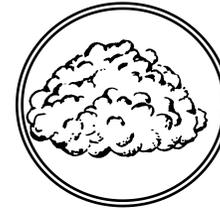
# Mixing in DIOSNA Granulator



Powder



Plastic mass



# Extruding with Gabler DE40 Extruder

## Process Steps:

- Dosing/Extruding

Plastic mass



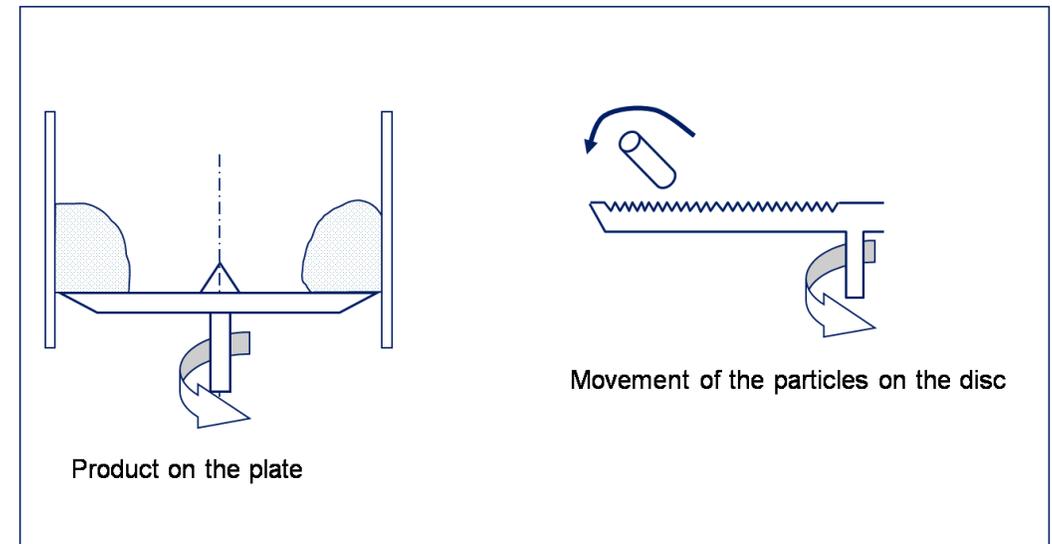
Small granules



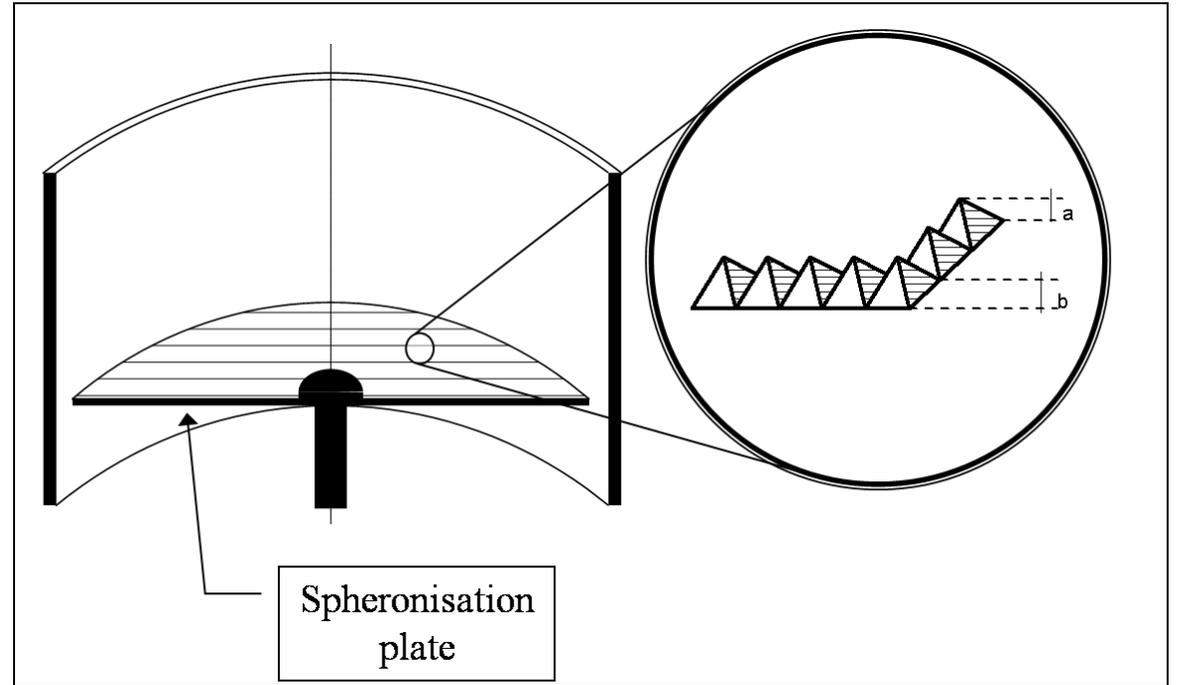


# Spheronizing

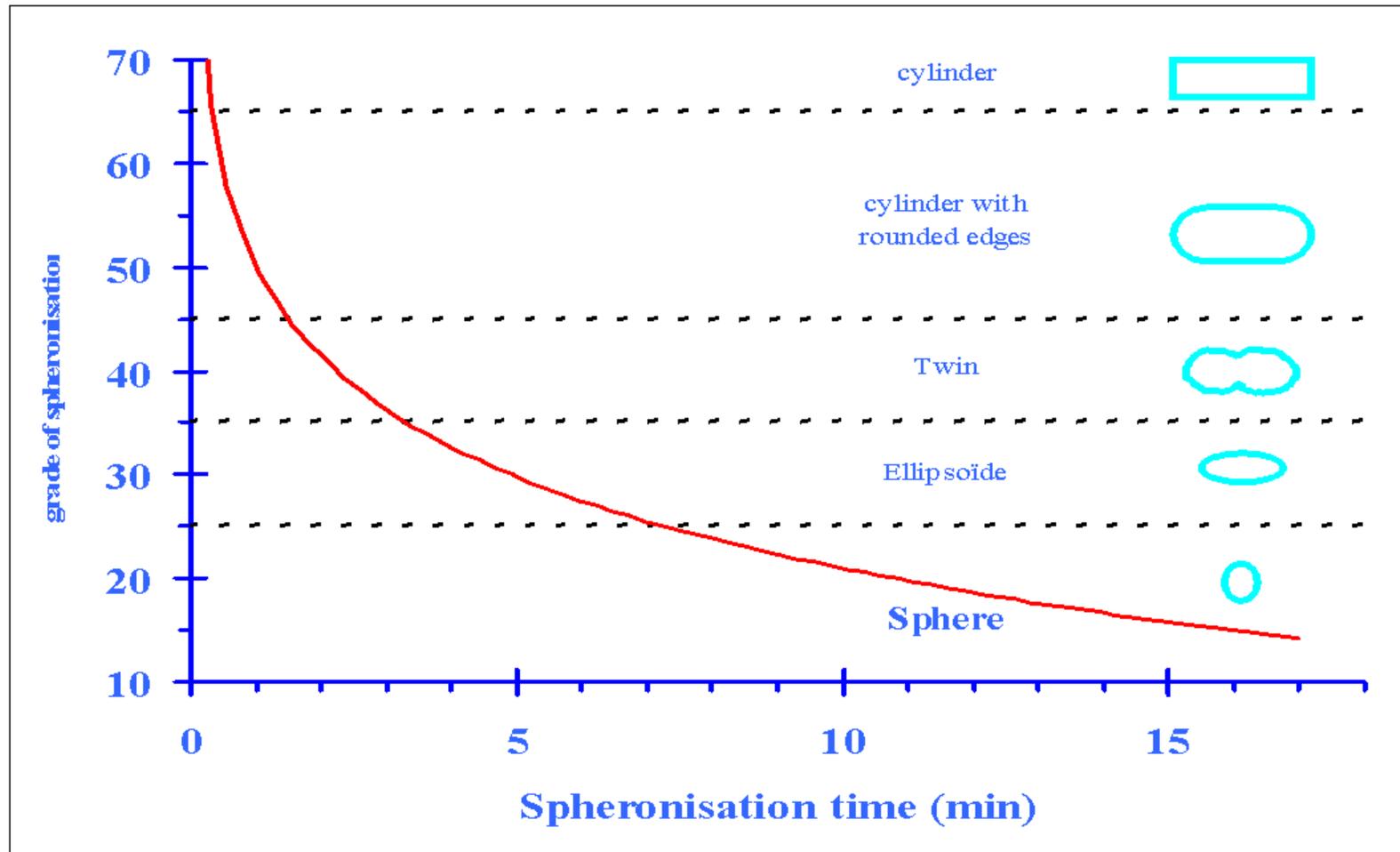
- The machine transforms the extruded into spheres. A precisely grooved rotating spheronization disc on the bottom of the barrel causes the particles to move outwards to the wall of the barrel. The rolling motion on the sidewall works the particles into spheres. Dust particles are binded into the pellets. Overpressure in the gap between disc and barrel avoids dust accretion.
- During spheronization the disc spins above the discharging window in the barrel sidewall. For discharging the spheronization disc has to be moved by hand to the lower position.
- The pellets are thrown out of the discharging window by centrifugal forces.
- typical size of pellets  $\varnothing$  0,4 – 5 mm.
- typical batch size 0,5kg (Lab mach.) up to 6kg (production machine)
- typical spheronization time 1 – 5 min



# Spheronizing discs



# Transformation during spheronization



# Spheronizers R250, R500, R600, R700

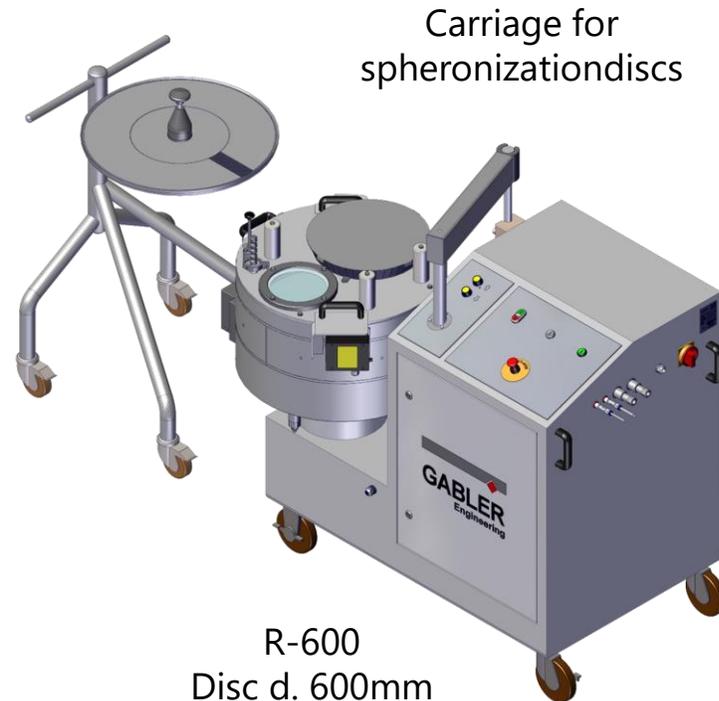
Spheronization machines from laboratory models to automatic production lines, GMP design for pharma industry. The pellets are thrown out of the discharging window by centrifugal forces.

Production Data:

- Pellet dimensions • 0,4 to 5 mm
- Batch Size • 0,15 to 6 Kg
- Spheronization time • 1 to 5 minutes



R-250  
Disc d. 250mm  
Batch 0.5 Kg



R-600  
Disc d. 600mm  
Batch 6 Kg



# Spheronization



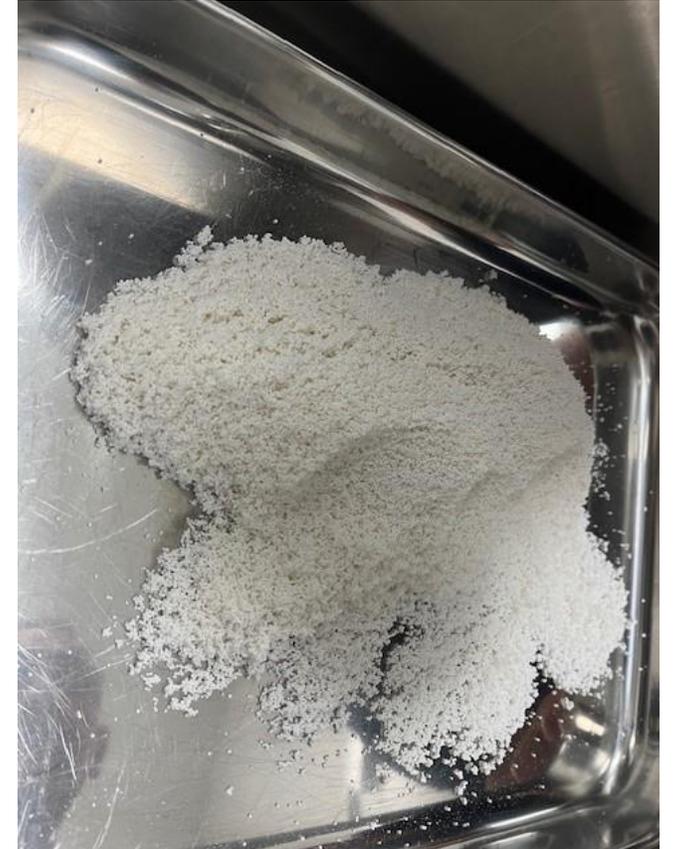
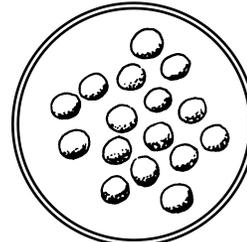
## Process Step

- Spheronization 3-5min

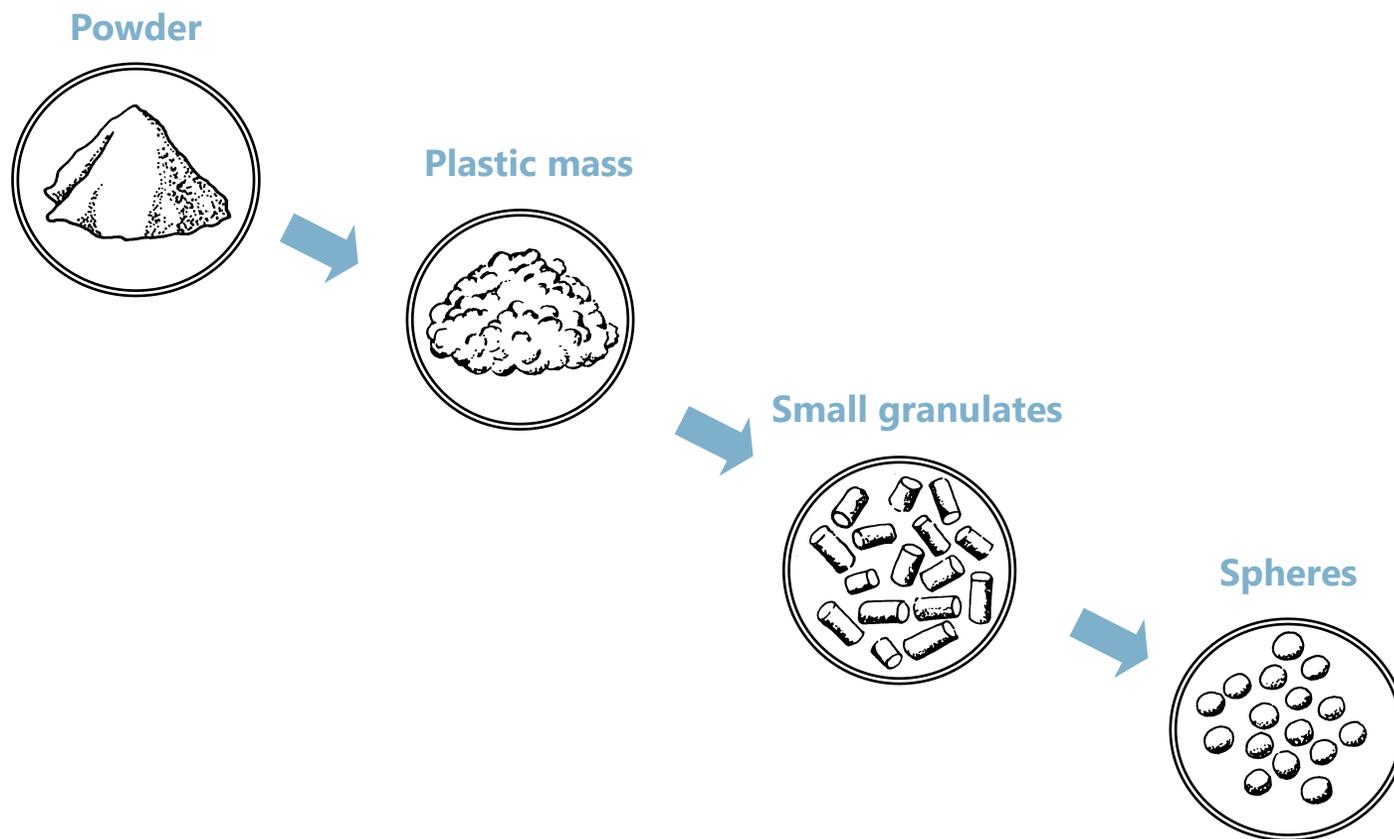
Small granules



Spheres



➤ All steps



A collection of various food ingredients including cinnamon sticks, coffee beans, cocoa powder, butter, and nuts, arranged on a light blue reflective surface. The background is a light blue gradient with several white circles of varying sizes scattered across it.

**THANK YOU  
FOR YOUR ATTENTION**

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