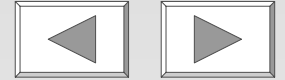
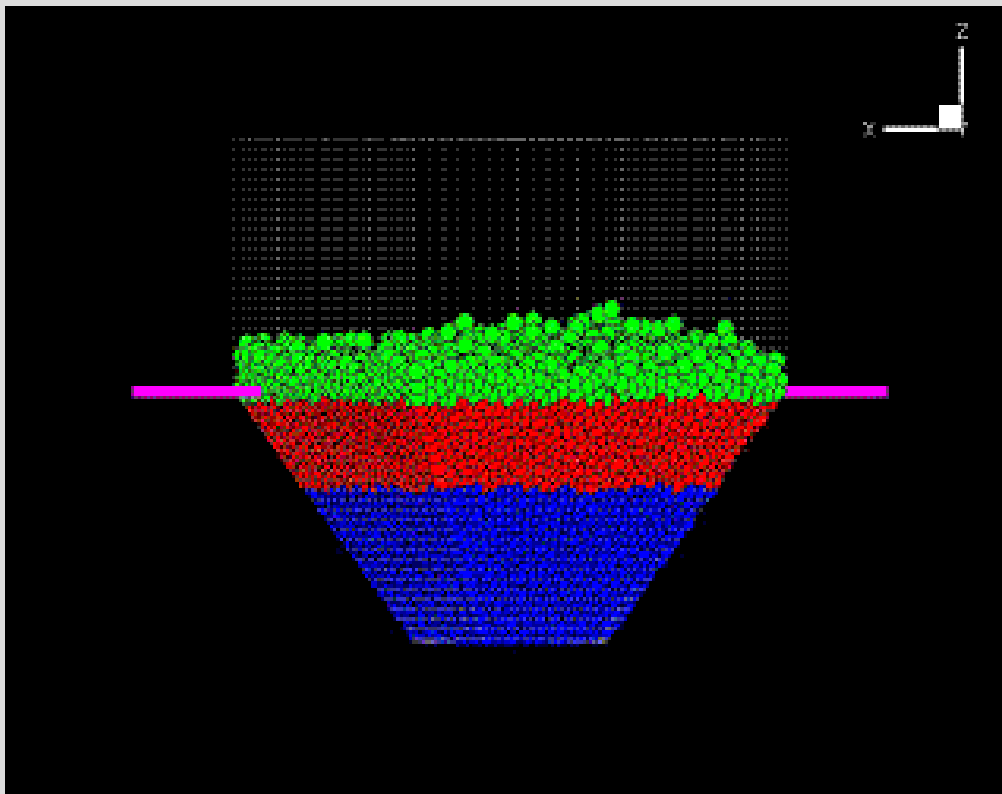


# IBC s & IBC Blender

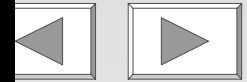
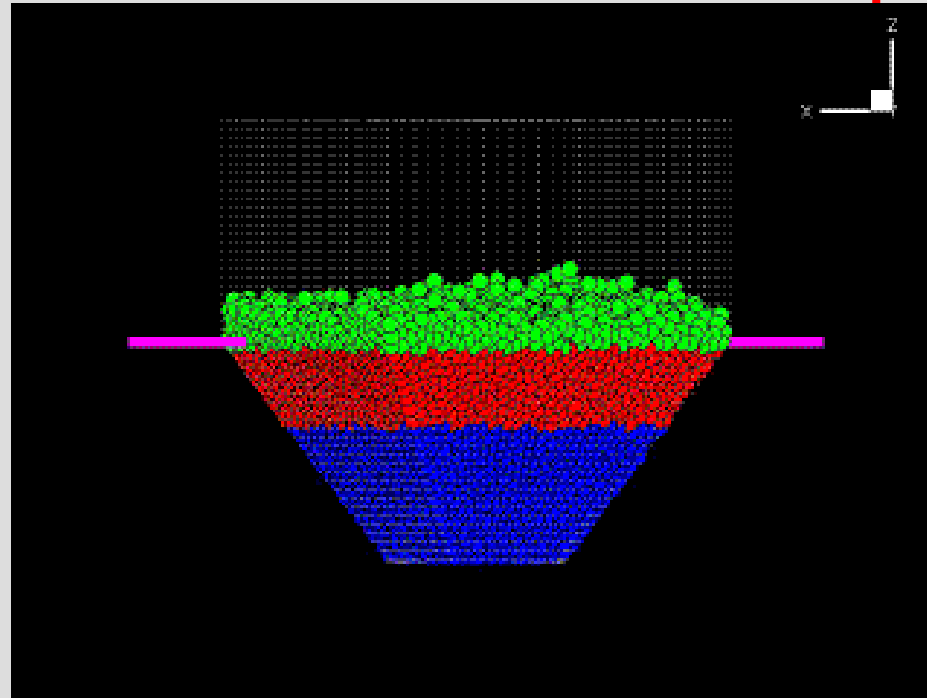


MAIN MENU



# Container Blender

Process Parameter: Container shape



MAIN MENU

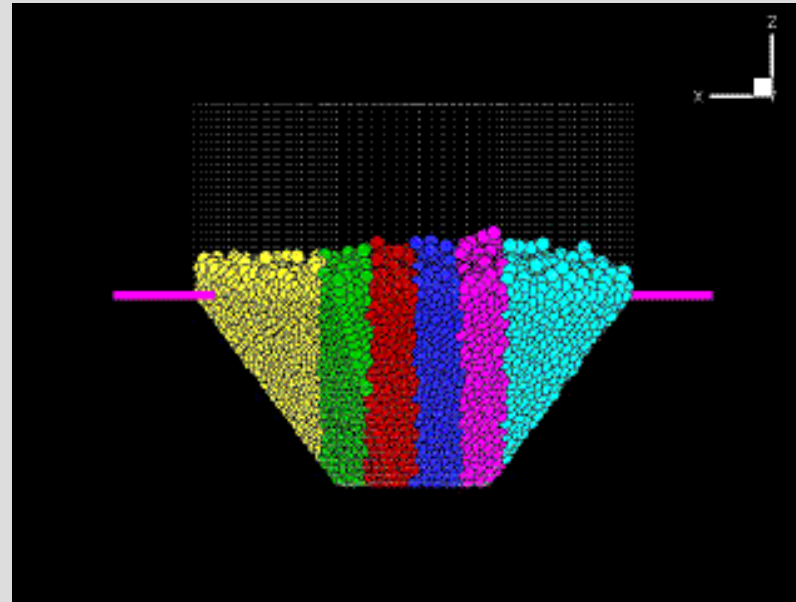
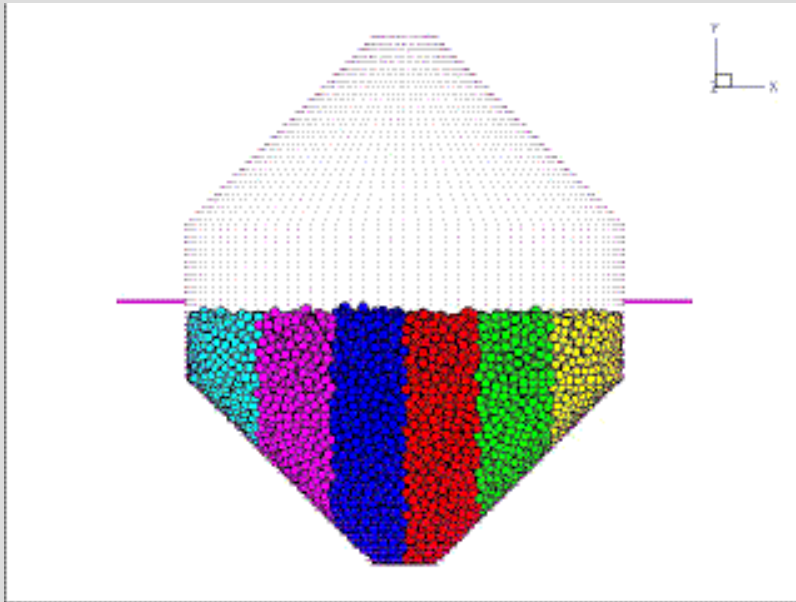


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# Container Blender

Process Parameter: Container shape



➤ Weak Turbulence in horizontal plane

☹ Increase of process time

🔑 Technologically feasible

Solutions:

☹ Additional axis of rotation

- **Price increase**

☹ Internal mixing elements

- **increased cleaning efforts**

➤ Intensive Turbulence in all planes

✓ reducing of process time

✓ no auxiliary devices necessary

✓ enclosed process

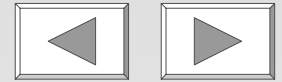
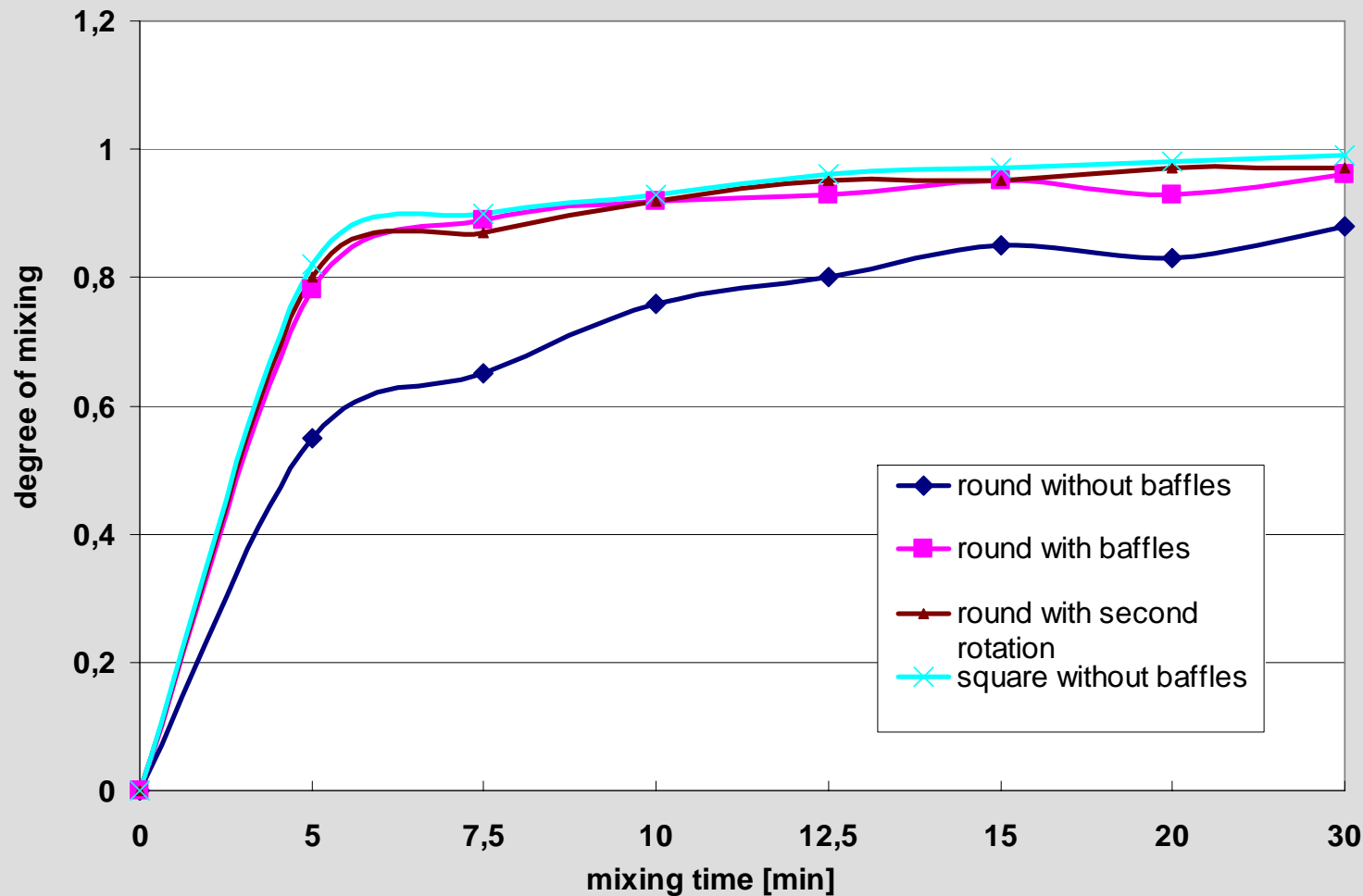
✓ no additional cleaning efforts

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# Container Blender

Process Parameter: Container Shape



MAIN MENU

IBC size: 1000 l  
Filling ratio: 60 %  
mixing speed: 10 rpm  
product:  
tableting mixture  
(Avicel PH 101: 30 %  
Lactose: 65 %  
Corn starch: 5 %)

(degree of mixing = 1 - RSD)

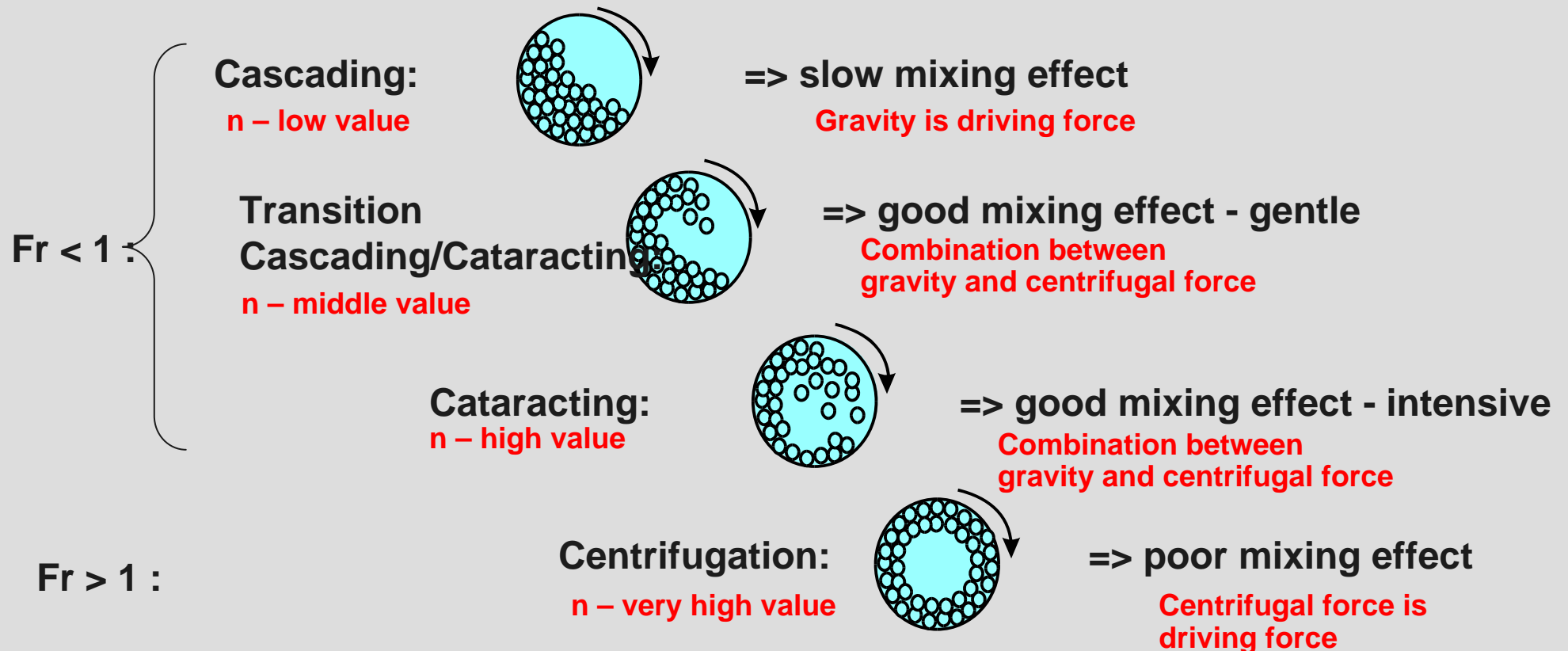


# Container Blender

Process Parameter: Mixing speed / Container size

$$Fr = \frac{D (2 p n)^2}{2 g}$$

Froude - number (Fr): Value describing the character of particle movement in rotating systems ( Fr = centrifugal acceleration / acceleration due to gravity.)



# Container Blender

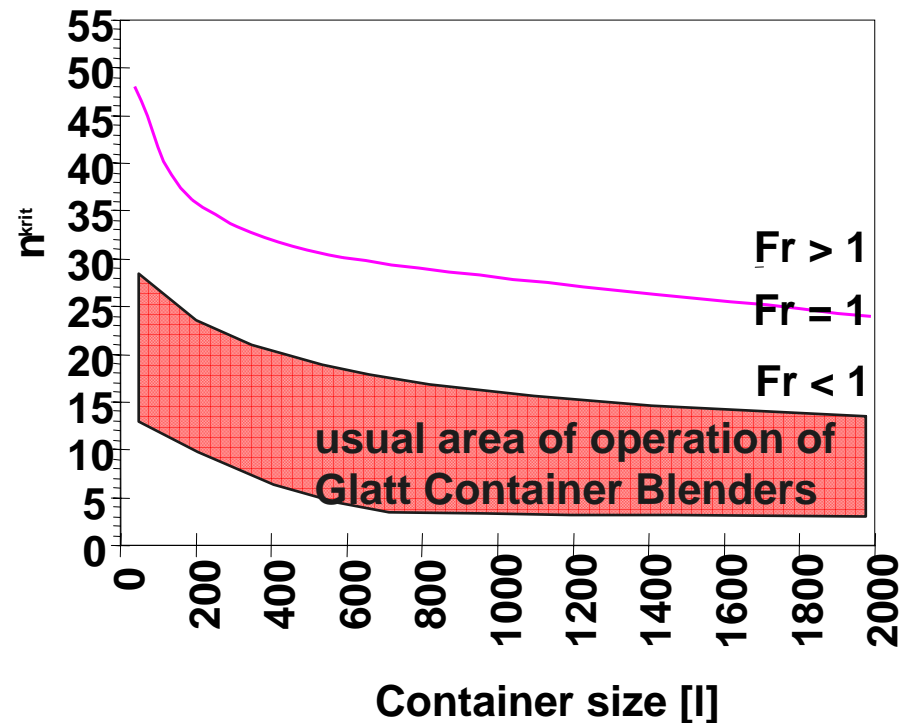
Process Parameter: Mixing Speed/ Container Size

Critical mixing speed  $n_{crit}$ :  
Mixing speed marking the  
transition from cascading /  
cataracting to centrifugation  
( $Fr = 1$ ).

$n_{crit} = f$  (container size,  
container shape,  
product properties,  
filling ratio)

=> empirical evaluation

Critical mixing speeds for different  
container sizes (filling ratio 0.6)

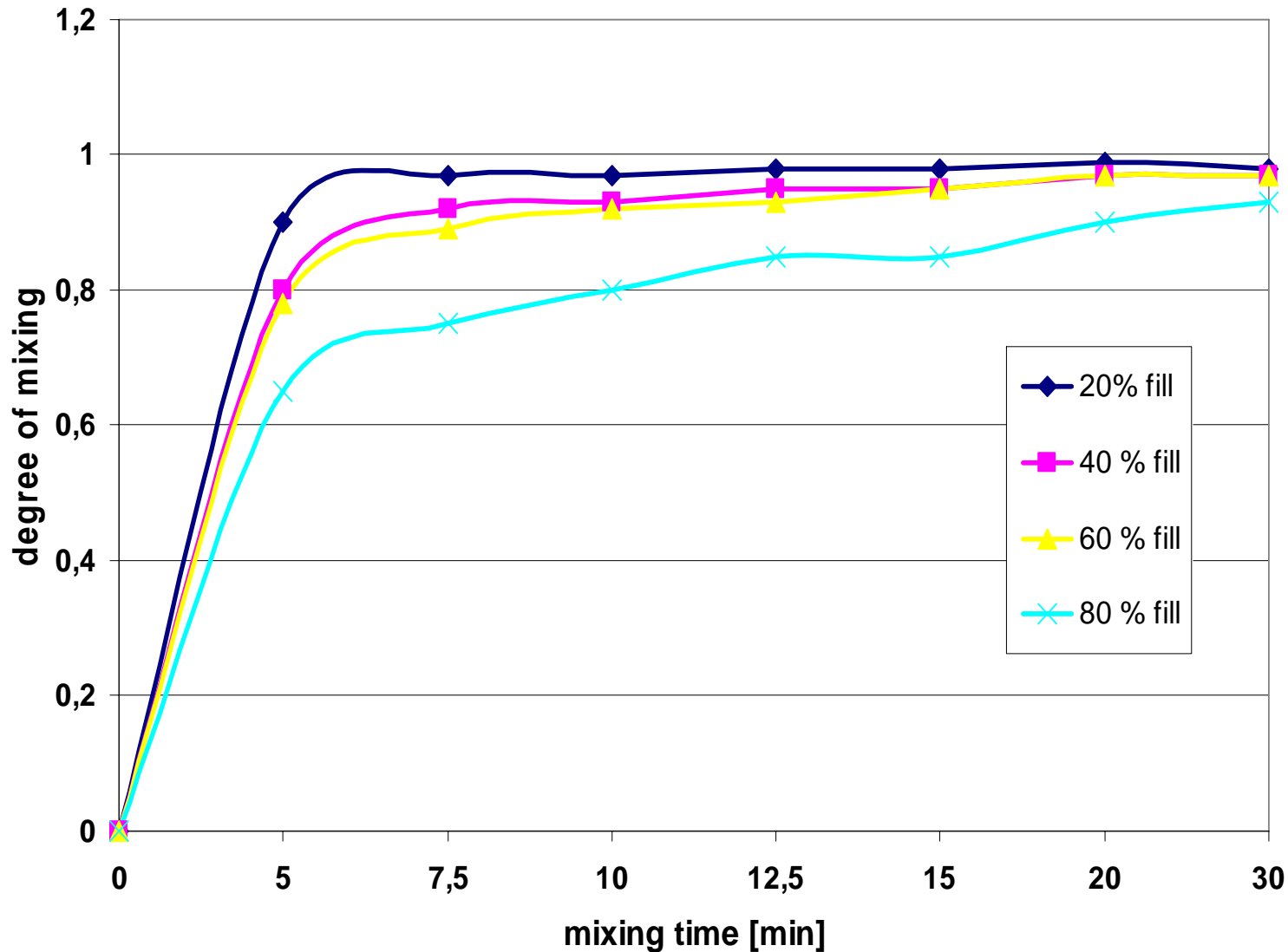


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# Container Blender

Process Parameter: Filling ratio



MAIN MENU

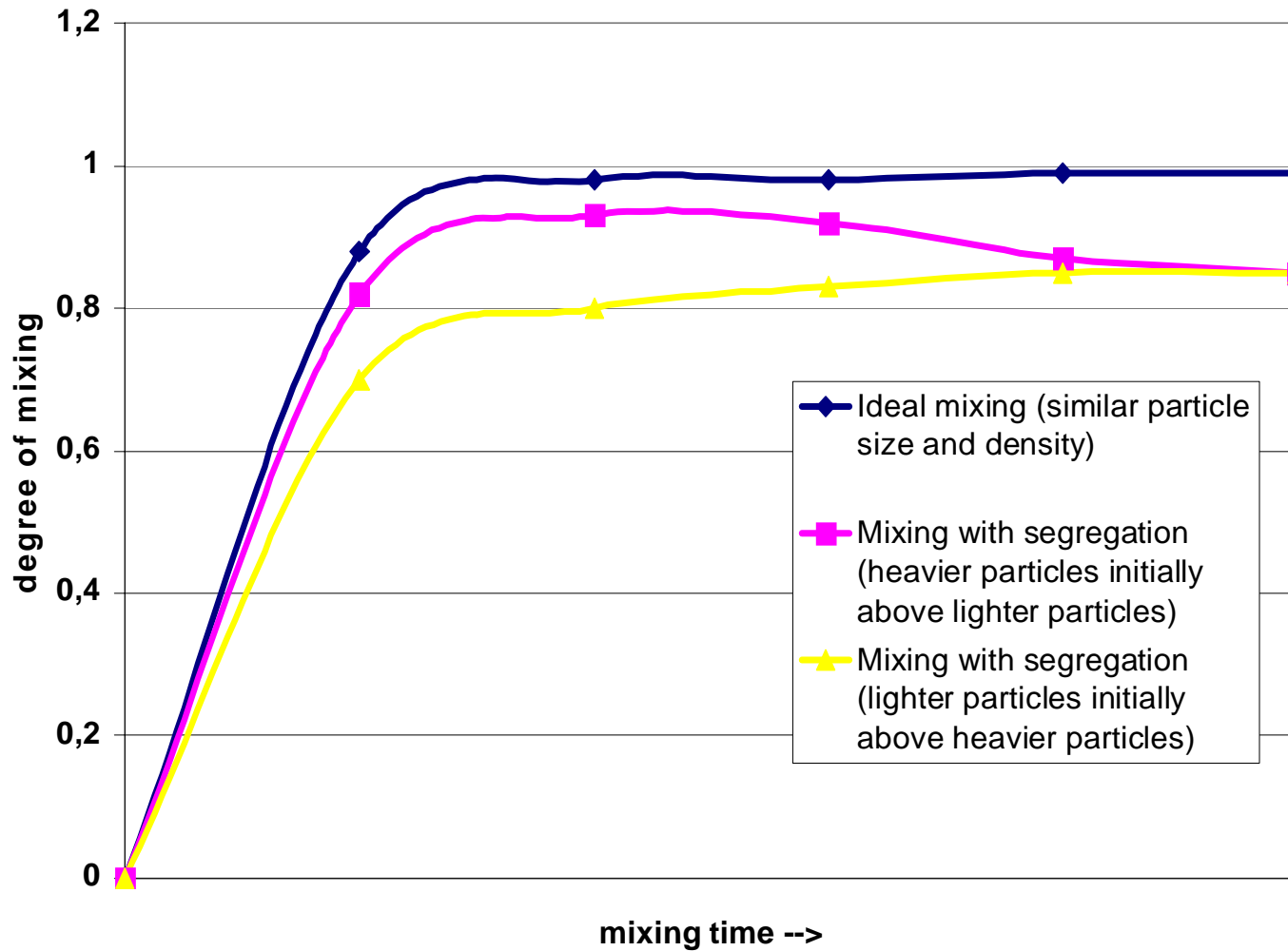
IBC size: 1000 l  
IBC shape: square  
1200x1200  
mixing speed: 10 rpm  
product:  
tableting mixture  
(Avicel PH 101: 30 %  
Lactose: 65 %  
Corn starch: 5 %)

(degree of mixing = 1 - RSD)



# Container Blender

Process parameter: Product properties / Segregation



(degree of mixing = 1 - RSD)

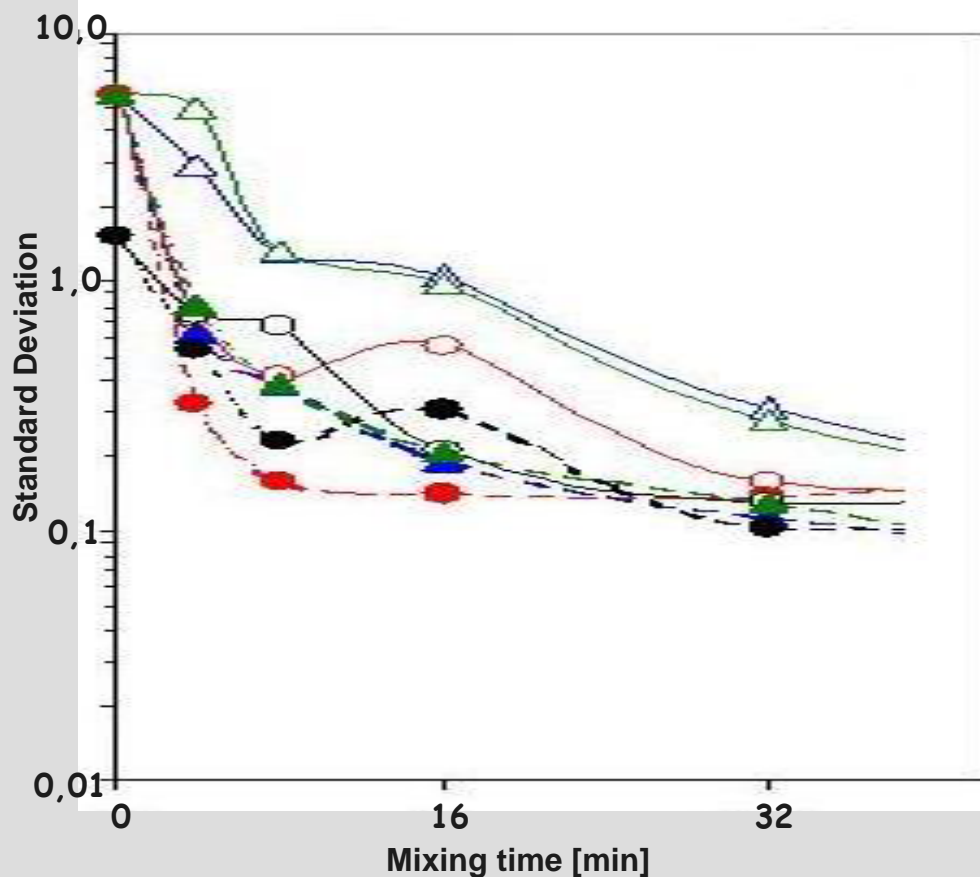


MAIN MENU



# Container Blender

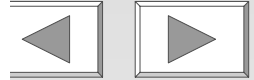
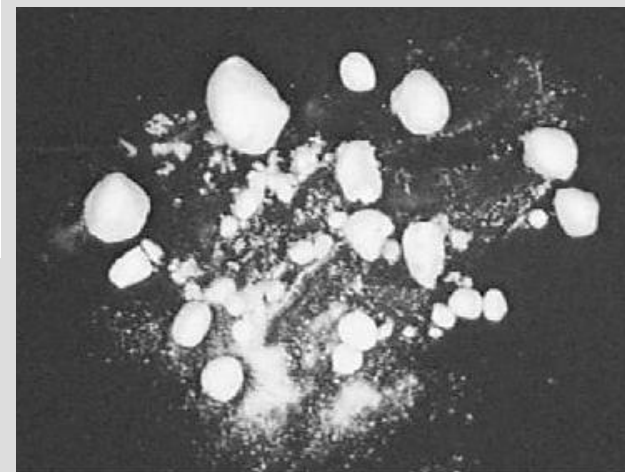
Process Parameter: Product properties- Agglomeration



MCC (excipient),  
KCL/NaCl (active)

Effect of Pre-blending  
on the degree of Homogeneity

- 40% Fill 3% KCl
- 40% Fill 3% KCl Pre-blend
- △ 60% Fill 3% KCl
- ▲ 60% Fill 3% KCl Pre-blend
- 40% Fill 30% KCl
- 40% Fill 30% KCl Pre-blend
- △ 60% Fill 3% NaCl
- ▲ 60% Fill 3% NaCl Pre-blend



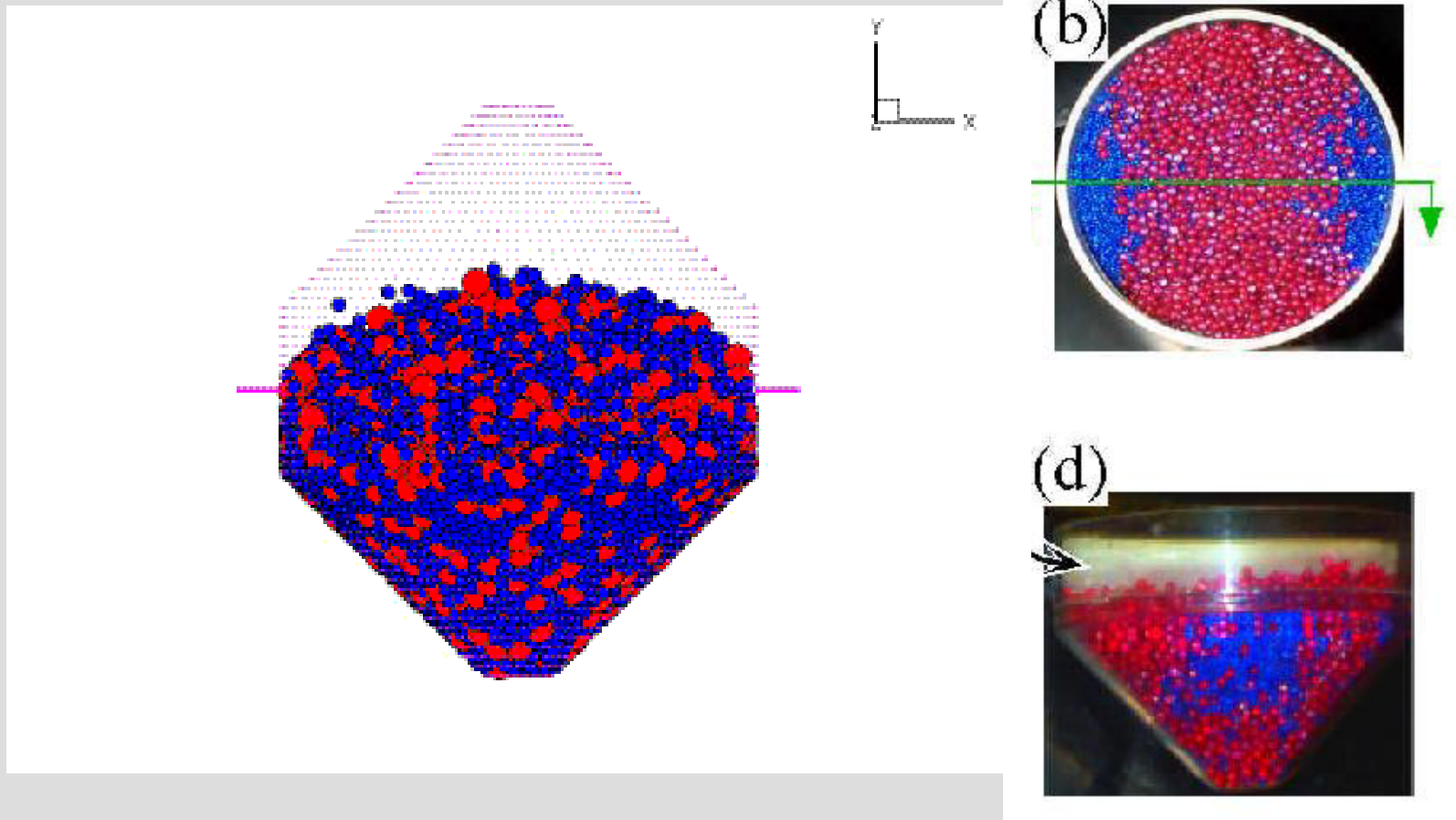
MAIN MENU



# Container Blender

Process Parameter: Product properties / Segregation

Over-mixing – In the case of mixing between Granulate and powder



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# Container Blender

## Process Parameter: Guiding values

The optimal adjustment of process parameters has to be evaluated in trials for the respective case especially under the aspect of validation.

Guiding values according to Glatt's experience are:

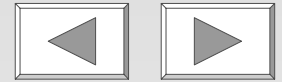
|               |   |
|---------------|---|
| filling ratio | 0,6 - 0,8 (granulate)<br>0,4 - 0,6 (powder) |
| mixing time   | 5 - 15 min                                  |
| mixing speed  | 5 - 18 rpm                                  |

(Values are valid for container sizes from 400 l to 2000 l)



### Logical conclusion: Glatt's standard container blender

- mixing time 0 - 99 min
- mixing speed 3 - 20 rpm



MAIN MENU

