PHARMA SOLID KNOWLEDGE REPORT

SYNTEGON
PROCESSING & PACKAGING

Tablet press feeding system.

One of the most important process step during tableting is the die filling, as it is responsible for a consistent tablet weight and drug content. Moreover, it affects the results of the subsequent compaction and ejection process, and thus critical quality attributes of the tablet. Consequently, the right selection of feeder type, paddle wheel geometry and rotation speed is particularly relevant to assure a uniform powder inflow reducing the risk of e.g. segregation, over-lubrication or pre-compression.

Feeder Design

Unique feeder design at its best, offers large flexibility to accommodate different challenging formulations very efficiently in user-friendly way.

Unique Design

- Each paddle/wheel is on a different level and provides gentle and effective powder handling inside feeder

Flexibility

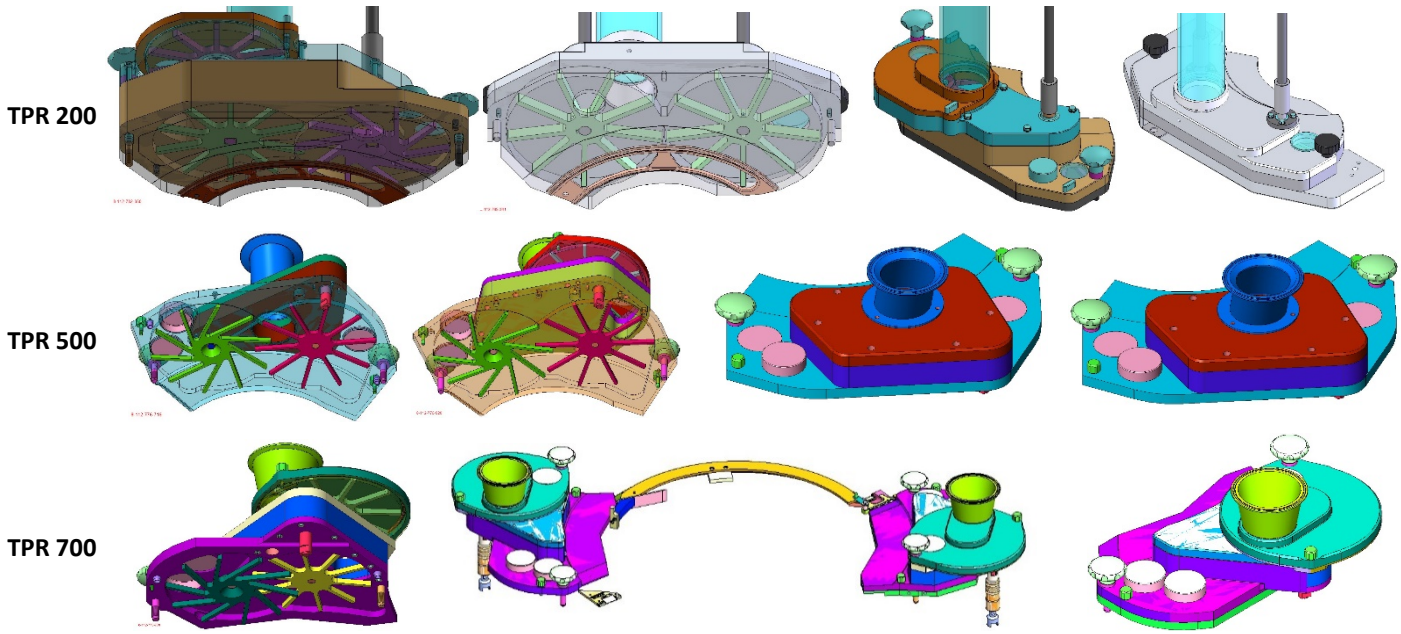
- According to the powder characteristics, either a two or three paddle feeder can be chosen
- Different paddle geometries (rectangle or round) offer flexibility to handle challenging powders with different flowabilities

User-friendly

- Retrofitting of two to three paddle feeder, or vice versa, provides user friendliness in operation

Efficiency

- Changes in the wheels' rotation provide more optimizing possibilities for different and challenging formulations
- Variable sealing segments with single point feeder height adjustment to increase efficiency and yield



Efficient feeder design – low powder consumption

- The remaining residual amount of product inside the feeder is very low, depending on the powder properties
- For tableting of silicified MCC (Prosolv® SMCC HD 90), a TPR 200 configured with 3-paddle feeder with round paddles and 20 punches was used. The feeder speed was set to 10 rpm for a machine speed of 75 rpm, with a main compression force of 5 kN
- From an initial quantity of 2,052 g Prosolv® SMCC HD 90, a quantity of 1,923 g good tablets was produced. Following, with 129.1 g the loss of powder and OOS tablets is very small (corresponding 6.3 % of 2 kg or 0.13 % for 100 kg)

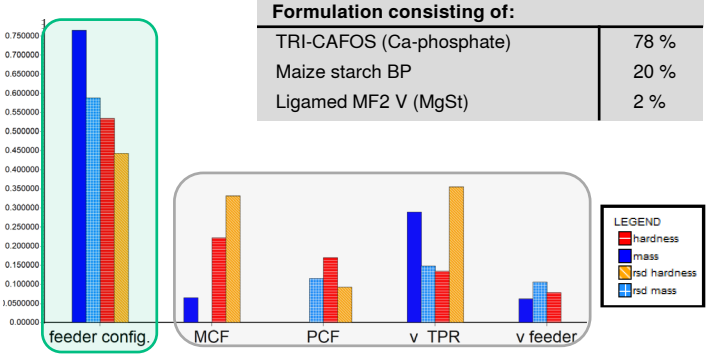
PROSOLV® SMCC HD 90, JRS Pharma

Tablet Press TPR 200

Initial mass	2052 g
Total mass of all good tablets	1923 g
Pre-compression force	2 kN
Main compression force	5 kN
Weight	260 mg
Hardness	98 ± 4 N
Total loss of powder and rejected tablets	129.1 g

Impact factors on tablet properties

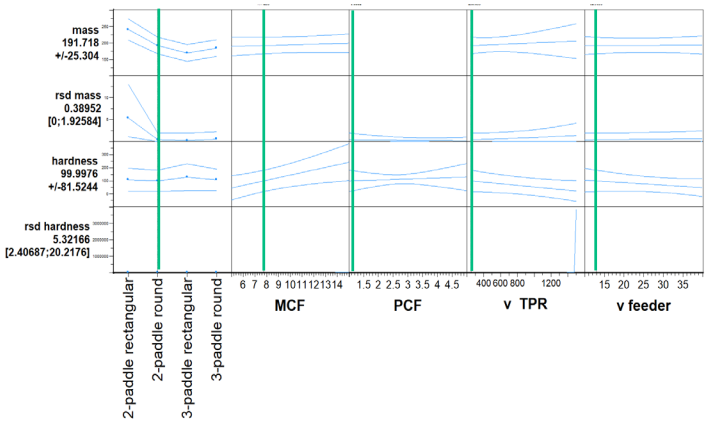
Suggestions for choosing an appropriate feeder:



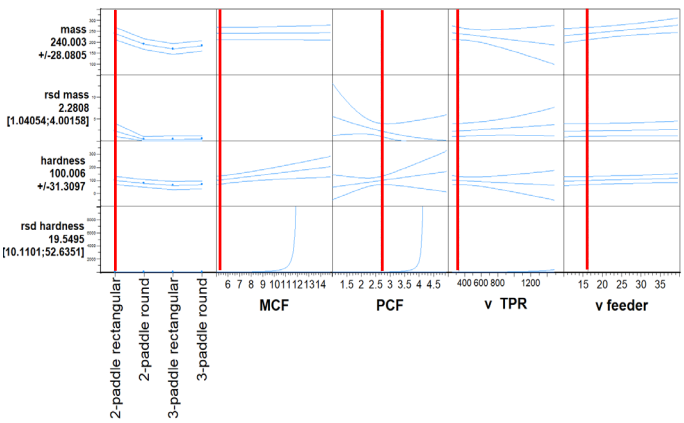
Formulation consisting of:	
TRI-CAFOS (Ca-phosphate)	78 %
Maize starch BP	20 %
Ligamed MF2 V (MgSt)	2 %

- Formulation with poor flowability properties and capping tendency
- Performance of trials based on Design of Experiments (DoE) for process optimization:
  - Main impact on all quality attributes by feeder design
  - Different impacts of process parameters on hardness, mass and RSD (Relative Standard Deviation) of mass/hardness

Process optimization for hardness of 100 N and low RSD hardness



Process optimization for hardness 100 N and tablet weight 240 mg



Conclusion

APD function under development

- Unique feeder design offers large flexibility to accommodate different challenging formulations very efficiently
- Unique design with different levels for each paddle/wheel provides gentle and effective powder handling inside feeder, also for MUPS handling
- Very small remaining residual amount of powder inside the feeder, depending on powder properties
- Statistical trial planning (DoE) for process optimization and selection of appropriate feeder

Your need is our passion!

You also have processes for optimization?
Please contact us. Our "Engineering Pharmaceutical Service" team will be available with all our experience of over 50 years:

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