

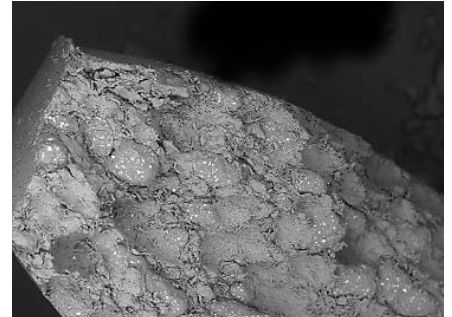
## PHARMA SOLID KNOWLEDGE REPORT

# Tablet Press (TPR) ready for MUPS.

Multiple Unit Pellet Systems (MUPS) tablets are produced by compressing a mixture of drugs containing pellets and powder excipients. The pellets have a spherical core that contains or is coated with the active ingredient and one or more protective layers to control drug release. Due to the differences in particle size and density, MUPS formulations have a tendency towards segregation.

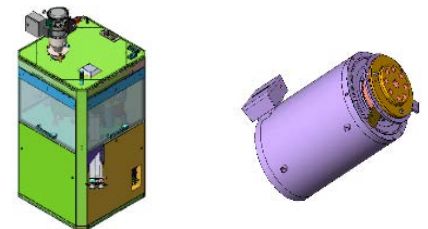
In this report the mechanical design aspects of the TPR are highlighted, which prevent segregation and the rupture of the pellet coating in handling of MUPS formulations – soft handling.

TPR series is ready for efficient handling of MUPS formulations.



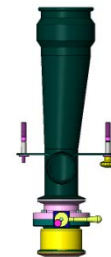
### Formulation Homogeneity by Torque Drive + Cork Sheet

Machine-base plate design with cork sheet (underneath the base plate) and torque drive (replacing a motor with gear box) provides lowest vibrations and supports maintaining formulation homogeneity.



### Homogenous Powder Feeding by Transfer Pipe Design

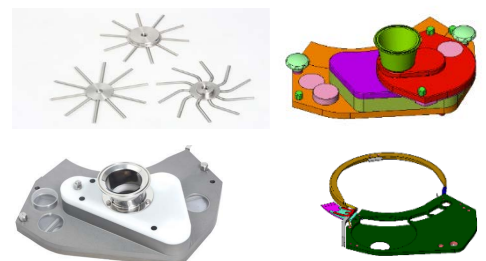
Straight pipe design transfers the formulation to the feeder columnwise and maintains homogeneity during powder transfer.



### Excellent Flexibility by Feeder System

The modular TPR formulation feeding system consists of a two-paddle feeder with independent drives and extendable retrofit of the three-paddle feeder – to achieve excellent flexibility for all types of formulations.

All paddles are working on individual height levels to avoid stress and compression.



### Stress-free Handling by Large Feeder and Flexible Wheels

Unique design of the feeder, as well as of the feeder wheels which are mounted in different levels and are interchangeable (round and square wheels, straight and angled wheels), lead to a low feeder wheel speed and stress-free handling of the MUPS formulation.



### Stress Free Handling by Integrated Die Plate

The patented integrated die plate, without die pockets and without re-circulation groove, handles MUPS formulations stress-free.

Fast change-over and enhanced productivity, due to additional numbers of die stations in the same PCD, lead to an output increase of 25 – 40 %.



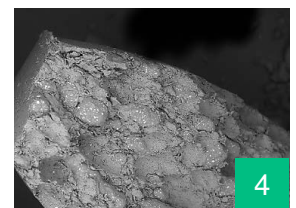
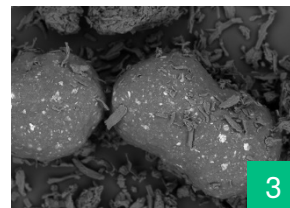
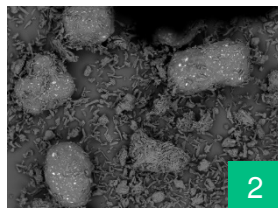
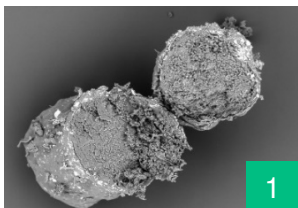
### Extended Dwell Time by EU441 Punches

EU441 punches are recommended for MUPS formulations, to extend dwell time and reduce vibration harmonics.



### CASE STUDY METROPROLOL SUCCINATE

The microscopic pictures (REM) of a Metoprolol Succinate MUPS formulation show the cross section of a pellet (1), the formulation mixture of powder and pellets (2), a formulation sample collected from the feeder (3) and the pellet distribution and intactness after tableting (4).



### Conclusion

- TPR series tablet presses are perfectly designed for MUPS formulation handling.
- It does offer high flexibility to accommodate the individual MUPS formulations.
- No segregation and gentle stress-free formulation handling are focused and covered by design.
- The unique feeder design does assure low shear forces by multi level feeder wheel arrangement.
- Furthermore the feeder design does prevent segregation or de-mixing, due to lowest wheel speed.
- MUPS-ready design, supported by a state-of-the-art modern machine control system - TPR.
- Pharma services for the formulation development are available within our Pharma Solid division.

### More Questions?

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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