

Common Issues on Tableting Performance

常见压片问题分析

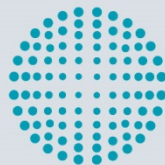
Tom Zhu

TECHNOLOGY



COMPETENCE

SERVICE



**FETTE
COMPACTING**

be efficient



Content

- ✓ Weight Variation
- ✓ Hardness Issues
- ✓ Sticking Problems
- ✓ Scale-Up Related Issues

Weight Variation-Overview Top Solutions

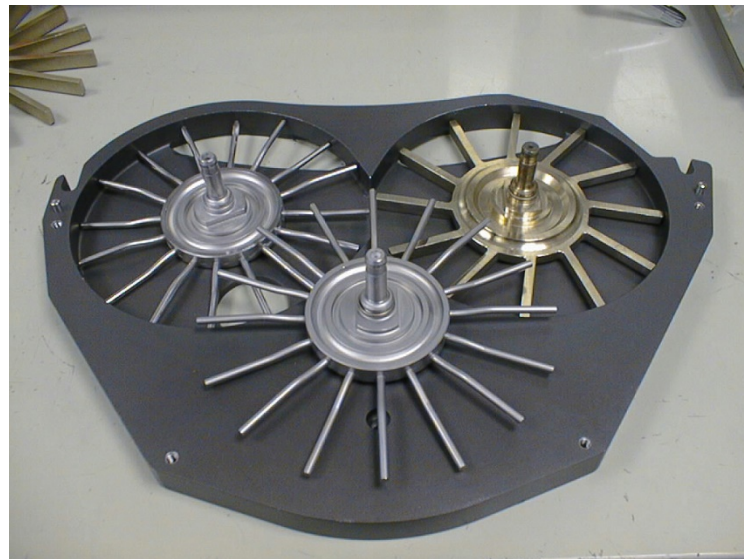
- Fill-O-Matic

 - Design and Set Up

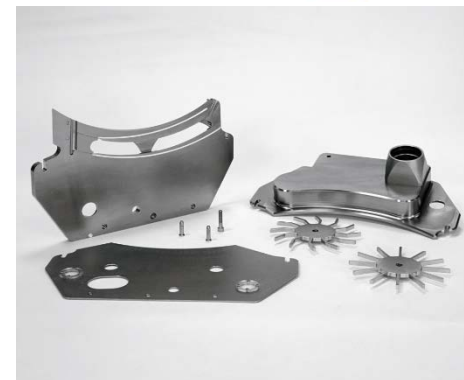
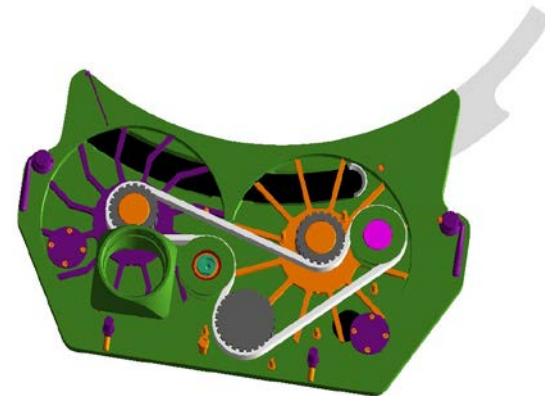
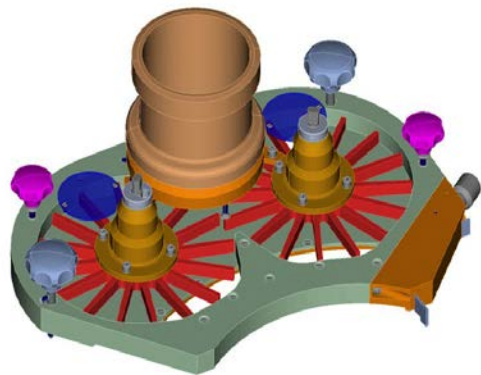
- Filling and Dosing Cam

- Penetration Depth

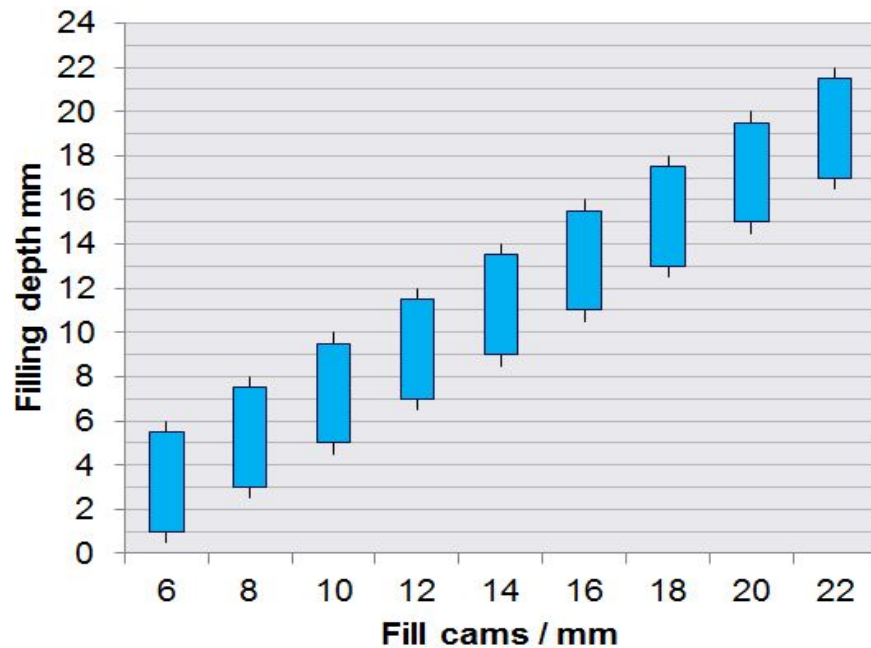
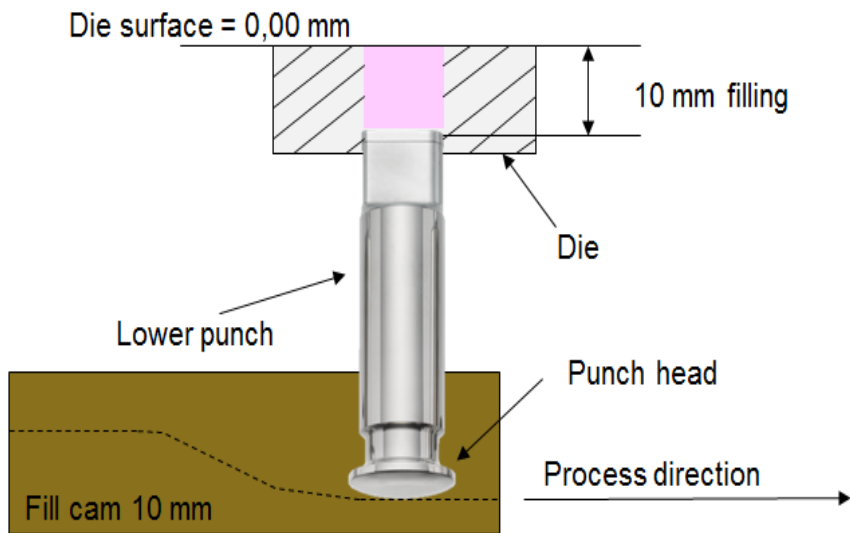
Fette Fill-O-Matic(FOM)



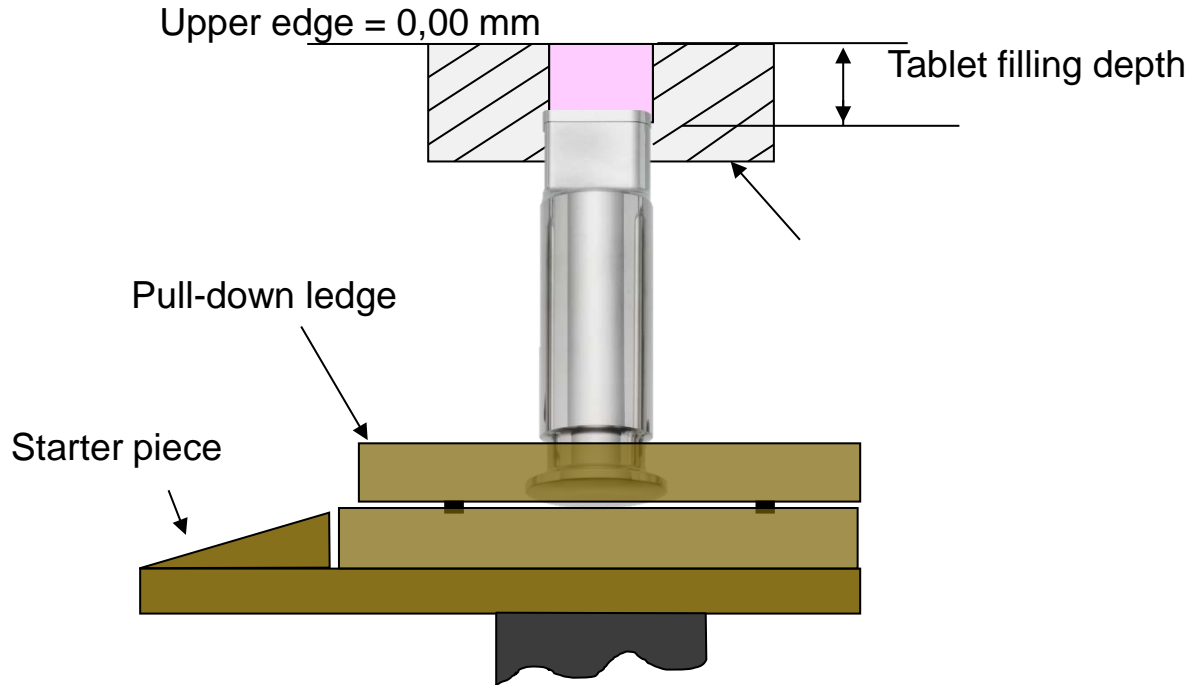
Different FOM Design



Filling Cam

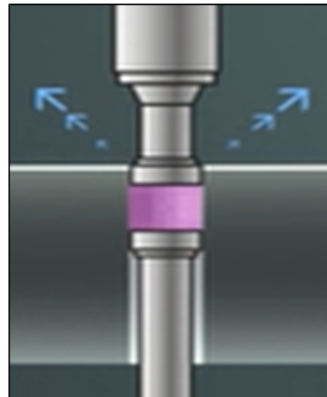
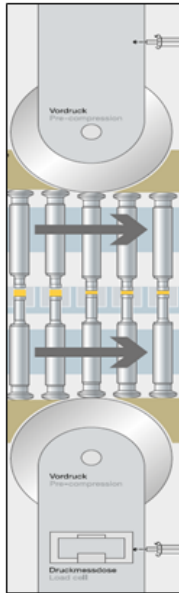


Dosing Cam



Penetration Depth

Pre-Compression

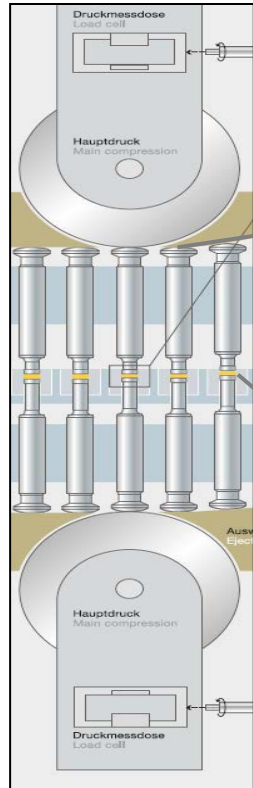


- Extract the air out of the blend

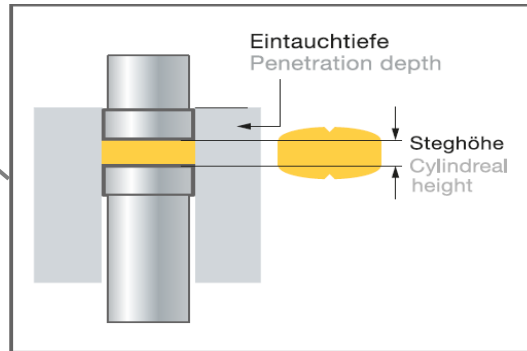
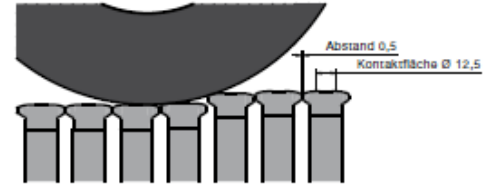
Hardness Issues- Overview Top Solutions

- Compression Station
- Tooling
- Pressing Zone
- Direct Compression

Compression station

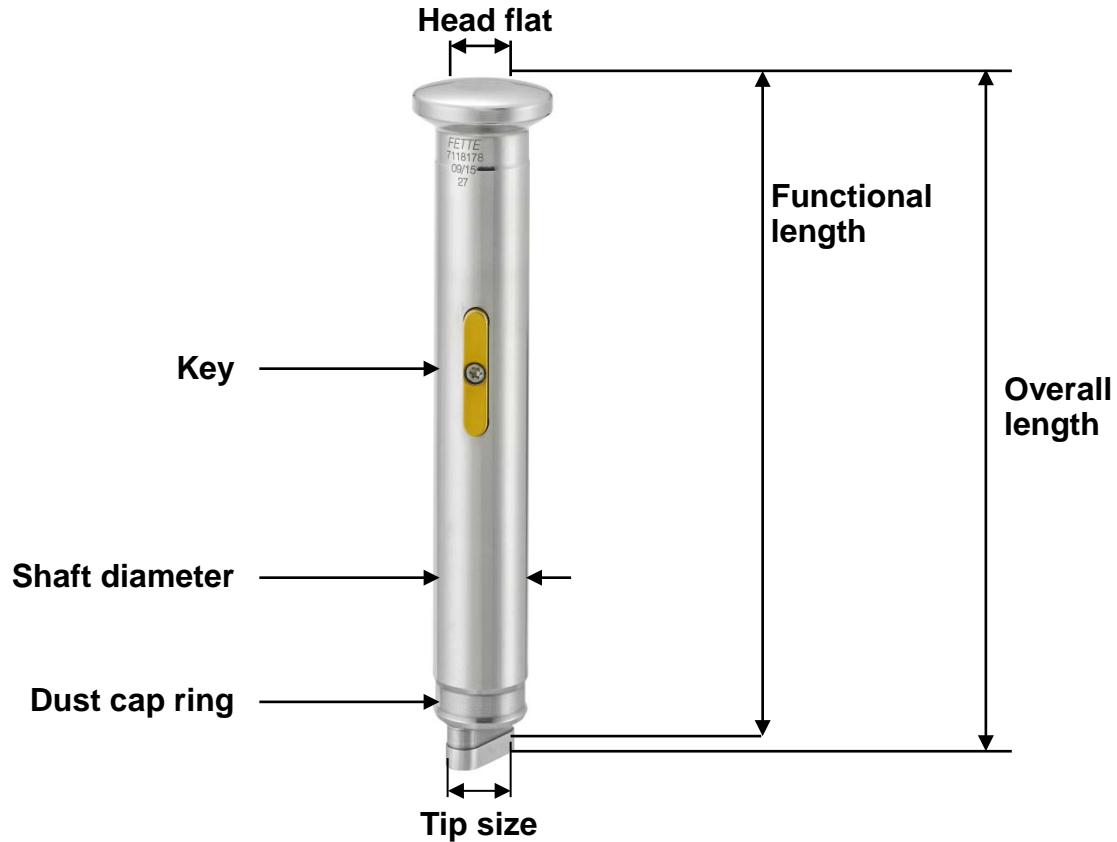


FS19®



• The final tablet is compressed

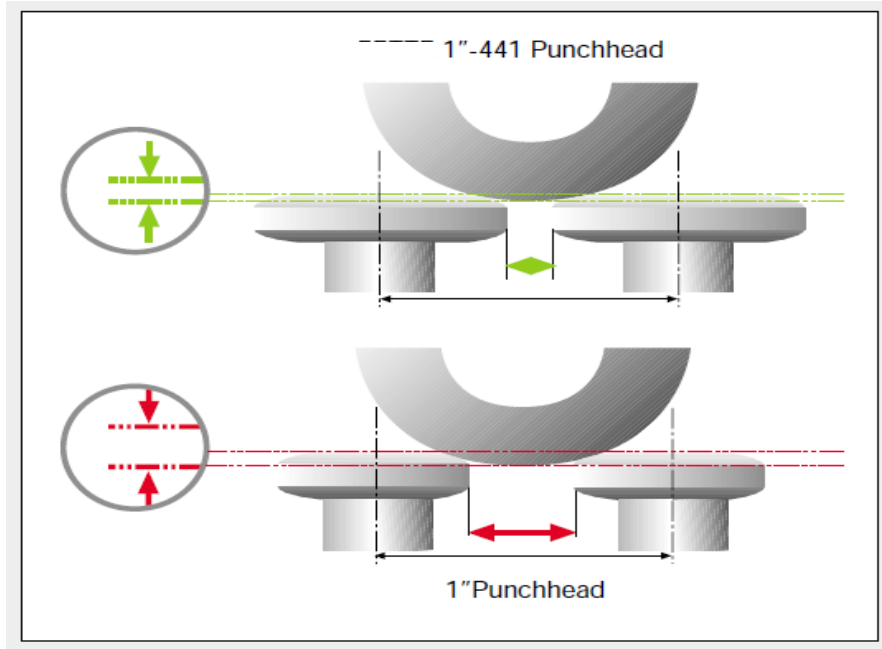
Punch Terminology



Head Design – Comparison Table

Head design	Shaft diameter [mm]	Head diameter [mm]	Length [mm]	Head flat [mm]
FS®12	12,00	19,00	133,60	8,00
EU19	19,00	25,27	133,60	9,60
TSM19	19,00	25,40	133,35	9,33
TSM19 domed head	19,00	25,40	133,35	9,53
FS®19	19,00	28,00	133,60	12,50
EU1“	25,35	31,60	133,60	16,00
TSM1“	25,35	31,75	133,35	14,60
TSM1“ domed head	25,35	31,75	133,35	15,90
EU1“-441	25,35	38,00	133,60	24,00

Compare EU1"-441 with EU1"

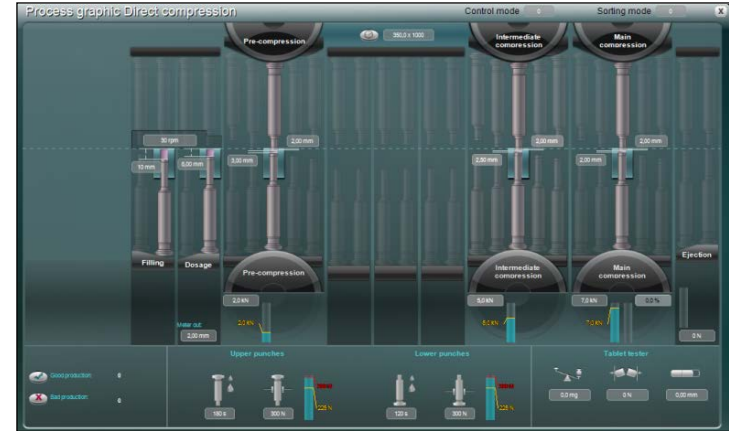
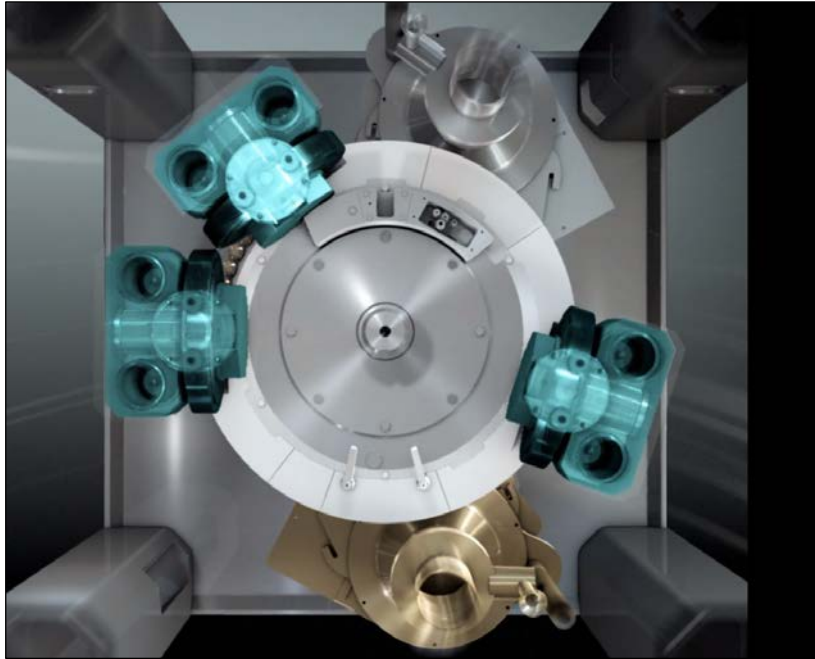


• Benefits

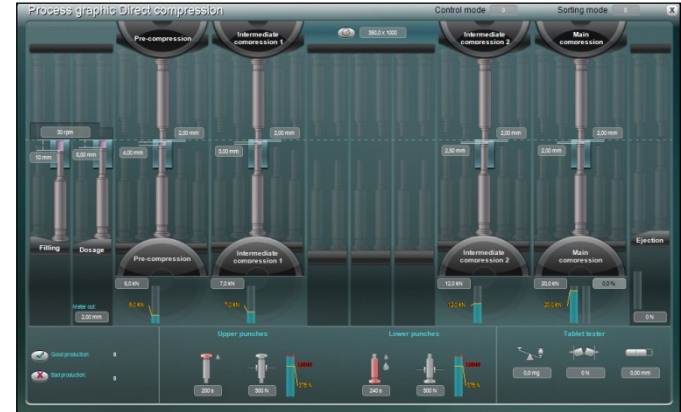
- 50% longer dwell time
- higher production speeds
- less movement on the compression station
- reduced vibrations
- lower noise level
- better run behavior



FE55 Direct Compression



FE75 Direct Compression



Sticking Problem - Overview Top Solutions

- ✓ Punch Coating
- ✓ Coating inlays
- ✓ FETTE PKB

Magnesium Stearate Spray System

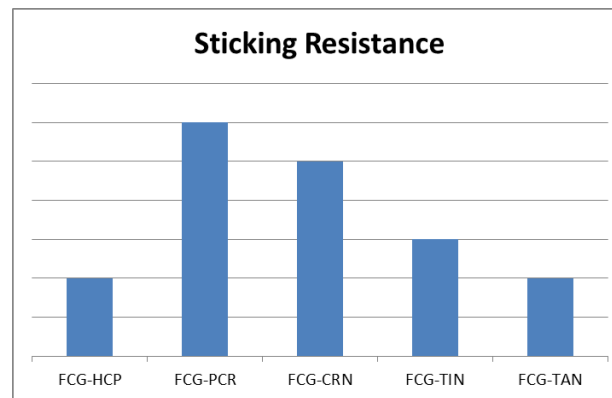
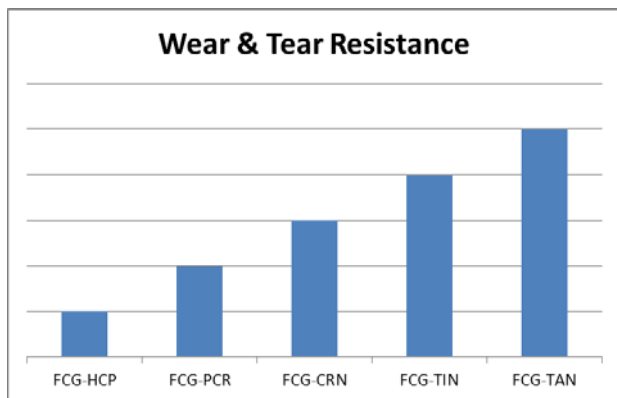
Punch Coating

Tableting tools requirements:

- High surface quality is needed for a good surface of the tablet
- Coating without defects
- Low adhesion for high-viscosity and sticky materials
- High wear resistance by using crystalline powder
- Good adhesion of the coating to the punch steel
- Different coating manufacturing processes
 - Electroplating (galvanic)
 - PVD -> **P**hysical **V**apour **D**eposition
 - FCG -> **F**ette **C**oating **G**rate



Coating: Table of FCG-Coatings



Coating	Thickness [µm]	Hardness [HV _{0,03}]	Color
FCG-HCP	3 – 5	1000	Silver
FCG-PCR	3 – 5	1100	Silver-blue
FCG-CRN	2,5 – 4	2000	Silver-grey
FCG-TIN	2,5 – 4	2500	Gold
FCG-TAN	2,5 – 4	3700	Grey-purple

Coating: Inlay

- For some application a coating is not advisable
 - In some applications, inlays can be used for anti sticking
 - An inlay is a kind of plastic or rubber plate which is fixed in the punch tip
-
- Silicon – transparent or red/brown color
 - Teflon – white colour
 - Vulculan – brown colour
 - Delrin – white colour
 - Adipren – white colour





FETTE PKB



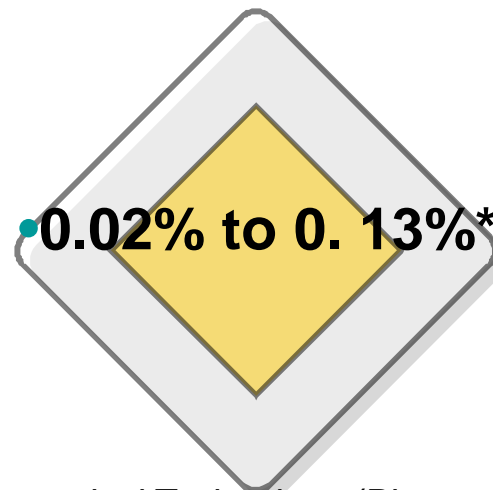


Concentration of Mg-stearate

➤ Internal lubrication



➤ PKB II / PKB III



Results proofed by the University of Bonn /Pharmaceutical Technology (Pharmaceutical Institute)

Scale-Up Related Issues

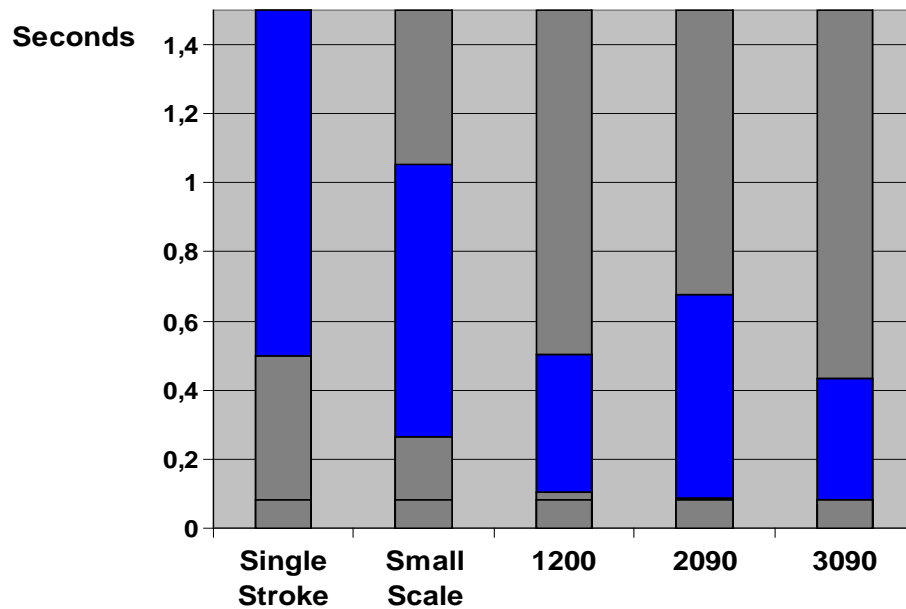
- Press and Tooling type
- Filling Method
- Compaction Time
- Compression Force

Press and Tooling Type

- Single Stroke Press
- Small Scale Rotary Tablet Press
- High Speed Rotary Tablet Press

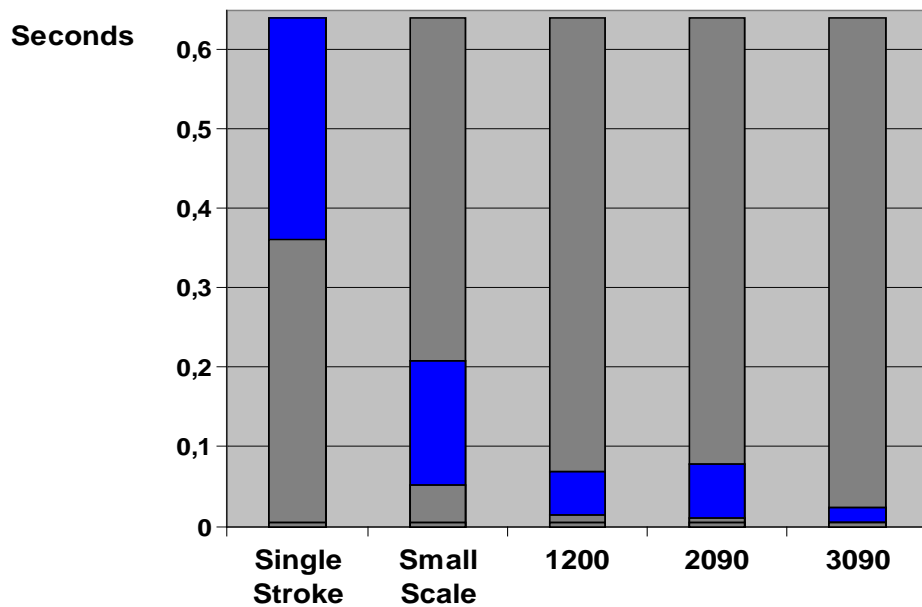


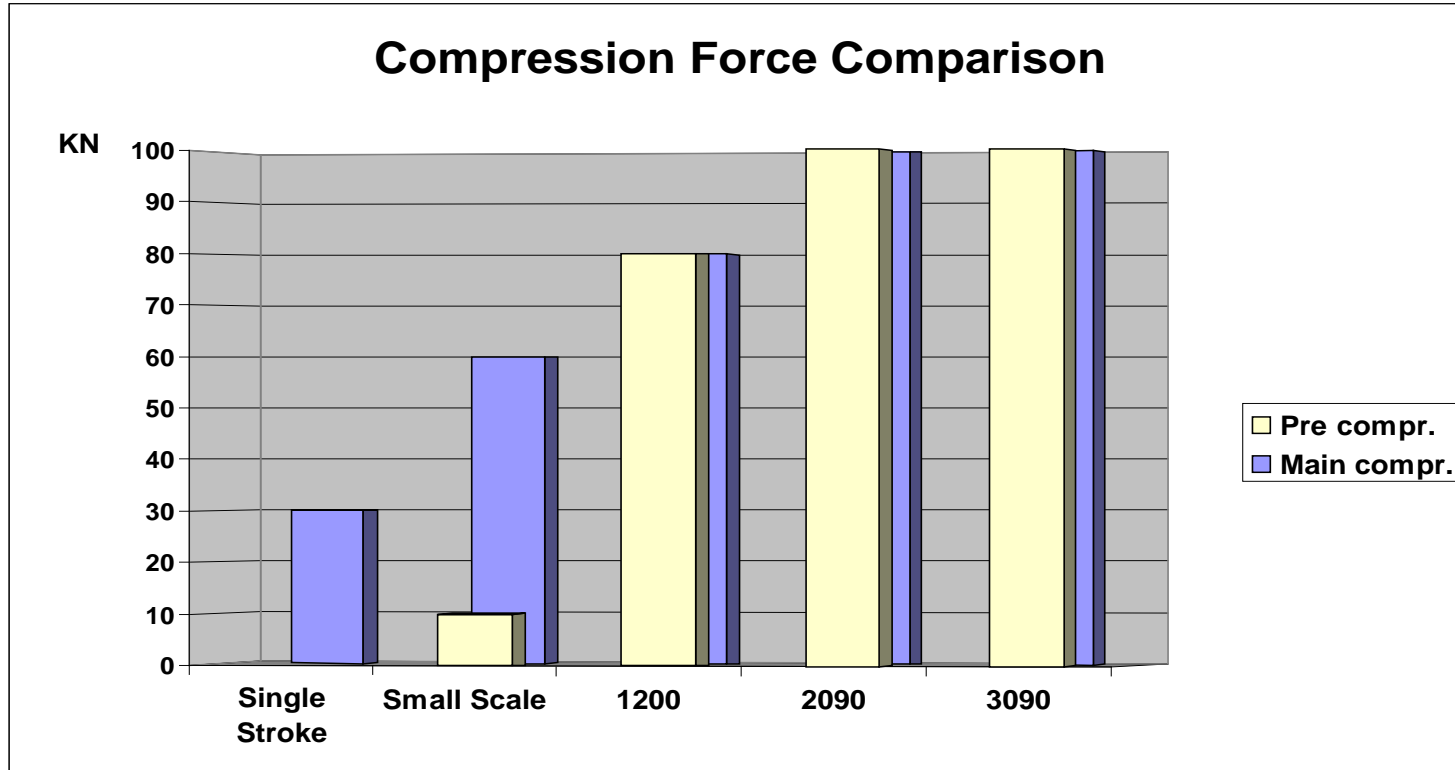
Filling Time Comparison

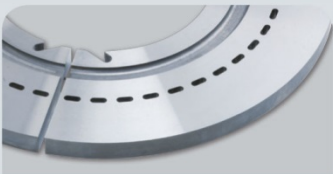
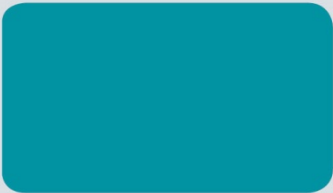




Compaction Time Comparison







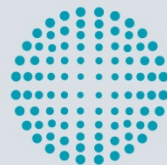
Thanks for your attention

TECHNOLOGY



COMPETENCE

SERVICE



**FETTE
COMPACTING**

be efficient