

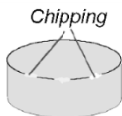
Making Tablets?

How to avoid tableting problems
(process optimization)

Chipping, splitting

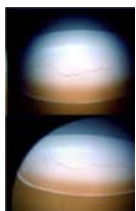
tablets too soft or too brittle

- **optimize tooling**
(check for damages; try different shape and size)
- **reduce compaction force**
(use MCC Tablet Press Monitor to observe force meters)
- **check take-off bar setting**
(use MCC Tablet Press Monitor to observe take-off force)



Picking

- **optimize tooling**
(polish punch tips; avoid embossing; try different shape and size)

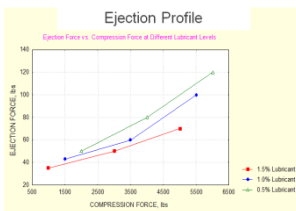


Cracking

- **decrease press speed**
(use MCC Tablet Press Monitor RPM meter, dwell time report)
- **optimize tooling**
(try different tooling geometry)

Excessive ejection force

- **monitor ejection sensor**
(use MCC Tablet Press Monitor to observe ejection profile)
- **optimize die wall lubrication**
(use MCC Tablet Press Monitor to observe upper & lower compression forces and take-off forces)



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Lamination

- **decrease press speed**
(use MCC Tablet Press Monitor RPM meter, dwell time report, study strain rate sensitivity)
- **optimize ejection force**
(use smaller cam angle to decrease rapid stress relaxation effect; use MCC Tablet Press Monitor to observe ejection profile)
- **optimize lubricant**
(use MCC Tablet Press Monitor to study lubricant effects)
- **optimize tooling**
(try tapered die to avoid rapid stress relaxation).



Let us help you solve your processing problems!

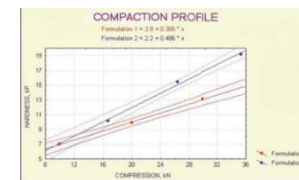
Punch Binding, Sticking, Picking

- **adhesion of powder to tooling**
(use MCC Tablet Press Monitor to see punch histogram and per-punch statistics, examine punch faces, geometry, embossing, finishing)
- **lubricant issues**
(use MCC Tablet Press Monitor to see lubricant / ejection profiles, optimize lubricant quality / quantity)
- **increase compaction force**
(use MCC Tablet Press Monitor to observe force meters)

Let us join forces with you
To develop your ideas!

Making Tablets?

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Capping

- **decrease press speed**
(use MCC Tablet Press Monitor: RPM meter, dwell time report, study strain rate sensitivity)
- **decrease compaction force**
(use MCC Tablet Press Monitor to observe force meters)
- **optimize precompression force**
(to decrease entrapped air; use MCC Tablet Press Monitor to observe force meters)
- **optimize tooling**
(check for damages; try different shape and size)
- **check take-off bar setting**
(use MCC Tablet Press Monitor to observe take-off force)



Slow Disintegration / Dissolution

- **reduce compaction force**
(use MCC Tablet Press Monitor to observe force meters)
- **increase press speed**
(use MCC Tablet Press Monitor RPM meter, dwell time report)
- **reduce feeder speed**
(avoid over-mixing of lubricant)

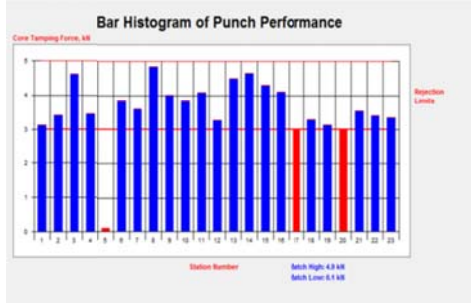


Making Tablets?

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Tablet Weight Variation

- check punch length variation
(use MCC Tablet Press Monitor punch histogram and per-punch statistics)
- optimize hopper/feeder settings
(improve flow and die filling)
- discard start/stop tablets
(maintain constant press speed)
- maintain content uniformity
(avoid segregation)



How to maintain tablet weight?

- use MCC Tablet Press Controller recipe-driven force controller (dosing control, bad tablet rejection)
- Optimize flowability of powder perform lubricant studies

Recipe File PLACEBO	
Recipe Name	Placebo
Product Number	Product No. 1234567
Tooling	16" flat face IPT B Tooling
Tablet Weight	
Target, mg	300
Control Limits, %	3.3 From 290.1 mg to 309.9 mg
Rejection Limits, %	3.3 From 290.1 mg to 309.9 mg
Alarm Limits, %	4 From 288.0 mg to 312.0 mg
Shutdown Limits, %	5 From 285.0 mg to 315.0 mg
Target Tablet Thickness, mm	5.5
Target Tablet Hardness, N	100
Target Press Speed, RPM	40
Target Batch Size, tablets	1,000,000
Target Batch Size, kg	300.0

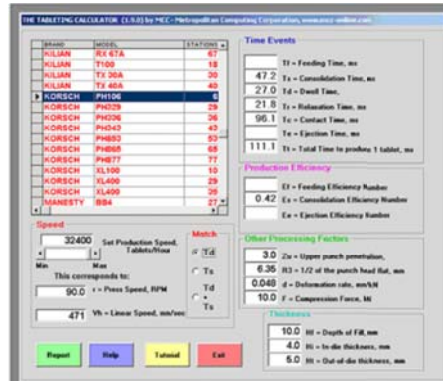
Measurement Control Corporation
13D Great Meadow Lane
East Hanover, New Jersey 07936, U.S.A.
www.mcc-online.com phone: (800) 504-9010
email@mcc-online.com

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Moving your formulation to another tablet press?

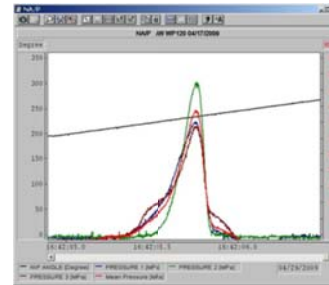
- match compaction time
- match compaction force
- determine optimal press speed
(use MCC Scale-Up Calculator to compare consolidation and dwell times on different tablet presses, use MCC Presster to optimize press speed)



and tooling)

How to optimize dry granulation?

- monitor process variables
(use MCC Roller Compactor Monitor & instrumentation to measure and record roll gap, roll speed, screw speed, hydraulic pressure, nip angle, ribbon temperature)
- monitor roll force
(use MCC normal roll stress transducers)
- predict ribbon density in real time
(correlate all process variables with ribbon properties; use MCC Roller Compactor Monitor to predict ribbon density)

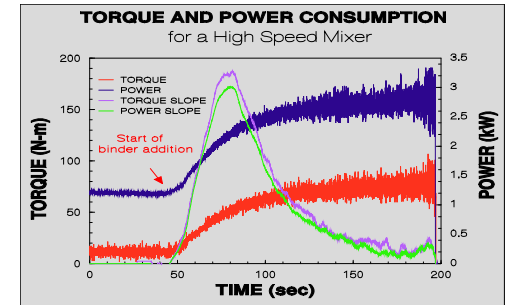


Making Tablets?

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How to optimize wet granulation?

- determine optimal end-point
(use MCC Mixer-Granulator Monitor to monitor torque and power consumption, calculate Newton Power Number N_p)



- reproduce end-point
(use MCC Mixer-Granulator Monitor to monitor torque and power consumption, stop batch when a desired Newton Power Number N_p is reached)
- determine scale-up factors
(use MCC Scale-Up Calculator to calculate the dimensionless numbers for the process, use dimensional analysis to create a prediction equation)
- use scale-up factors
(use MCC Mixer-Granulator Monitor to calculate in real time the dimensionless numbers for the process)
- optimize equipment
(use geometrically similar mixers)

“MCC” stands for Maximum Customer Care!

How to ensure regulatory CFR compliance?

- Use MCC 21CFR Part 11 module
(multilevel passwords with aging, audit trail)