

## Reducing Friability of Tablets for Film Coating by Using KG-1000

### PURPOSE

In the tablet film coating process, especially when it comes to large tablets especially with the size more than  $\phi 9\text{mm}$ , friability can be an issue at the early stage of the process. The purpose of the experiment was to confirm if Ceolus™ KG-1000, Asahi Kasei's Microcrystalline Cellulose ("MCC") with the highest compactibility out of our product lineup, can reduce the friability of tablets for film coating, through the comparison of three different MCC grades.

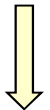
### OBJECTIVE

The objective of the study is to clarify whether Ceolus™ KG-1000 can reduce the friability of tablet cores in a coating process. The target friability criteria are less than 0.2%.

### METHOD

Mixing

MCC/corn starch/Lactose=5/5/89.5(%), 10kg in total  
MCC: Ceolus™ PH-102, KG-802, KG-1000, Asahi Kasei  
Lactose: SD Lactose. S-TAB. DMV



Mg-St 0.5wt% (mixed powder)

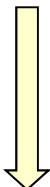
Mixing

for 30 sec. in PE bag



Tableting

Rotary press: LIBRA 2 (Kikusui)  
Gravity feeder, 12punches, 30rpm  
350mg/tablet,  $\phi 9.5\text{mm}$   
Evaluation: Tablet hardness, friability



Coating

Doria coater DRC-650 (Poerex),  
Volume=15L

Tablets: 7kg, Air volume:  $5.0\text{m}^3/\text{min}$ ,  
Drum: -50Pa (inner pressure), non-heated

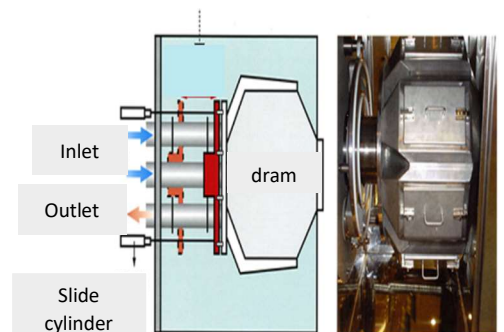
Preliminary process: intermittent motion,  
4rpm, 10sec rotation – 20sec stop

Coating process: continuous operation,  
rotation speed 12rpm, non-sprayed

Friability / SEM

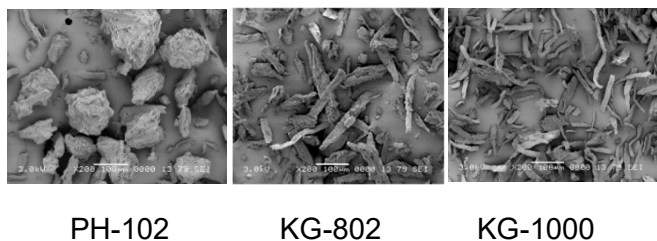


CLEANPRESS  
Correct



# RESULTS

Fig.1 Powder morphology of Ceolus™ grades



Tab.1 Powder properties of Ceolus™ grades

Grade	bulk density [g/cm <sup>3</sup> ]	Av. Diameter [μm]	Repose angle [°]	L/D [-]
PH-102	0.30	50	42	1.5
KG-802	0.21	50	49	2.8
KG-1000	0.12	50	57	3.5

Fig.2 Tablet hardness & Friability (after tableting)

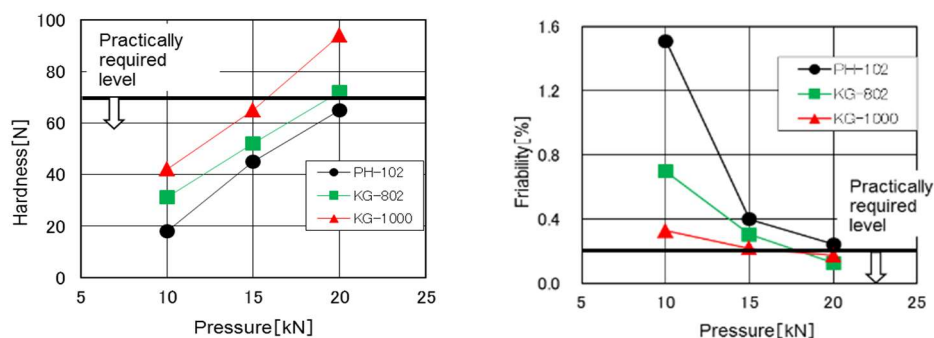


Fig.3 Tablet friability (after coating process)

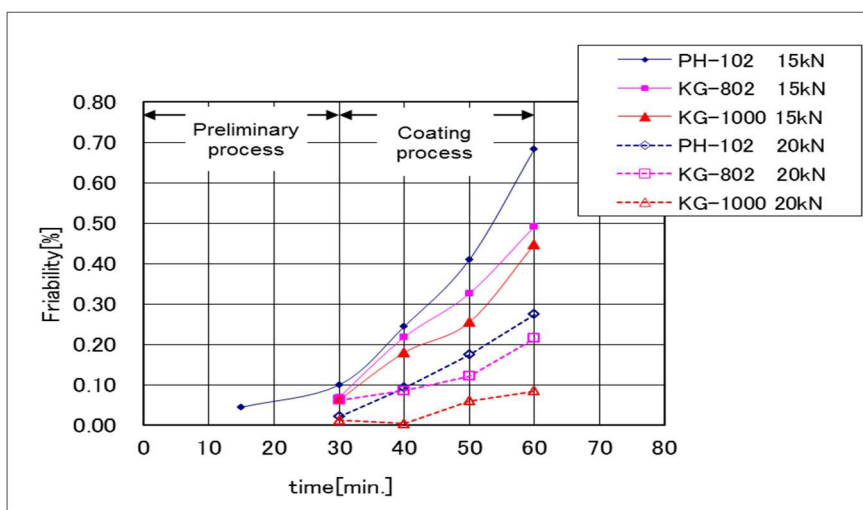
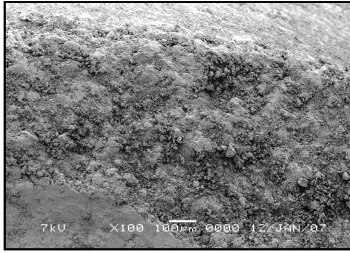
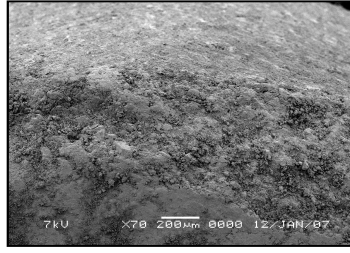


Fig.4 Tablet picture (after coating process)

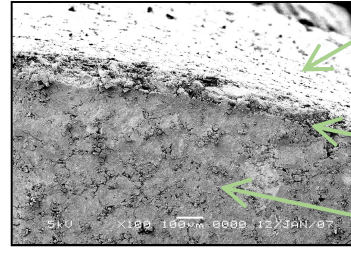
by SEM at 15 kN of pressure



Ceolus™ PH-102  
Many edge chippings



Ceolus™ KG-802  
Slight edge chippings



Ceolus™ KG-1000  
No edge chippings

Side  
Edge  
Top face

## CONCLUSION

The study confirms that in the film coating process the tablets friability can be reduced by adding 5% of Ceolus™ KG-1000 in the formulation.

High tablet hardness & low friability of tablet cores containing Ceolus™ KG-1000 contributes to achieve low friability in tablet coating, **KG-1000 is excellent in maintaining of tablets edges, KG-1000 can be recommended as a problem solver for the friability issue in tablet coating.**

## REFERENCE

The data of this page is a property of Asahi Kasei Corporation.