klucel™ exf ultra
hydroxypropylcellulose

ultra fine particle size tablet binder

description

Klucel™ hydroxypropylcellulose (HPC) has long been the tablet binder of choice for oral solid dosage forms in pharmaceutical applications.

Klucel™ EXF Ultra HPC, ultra fine particle size, takes tablet binding effectiveness to the next level. Need premium performance that assures formulation predictability, reliability and robustness? Klucel™ EXF Ultra HPC is your solution.

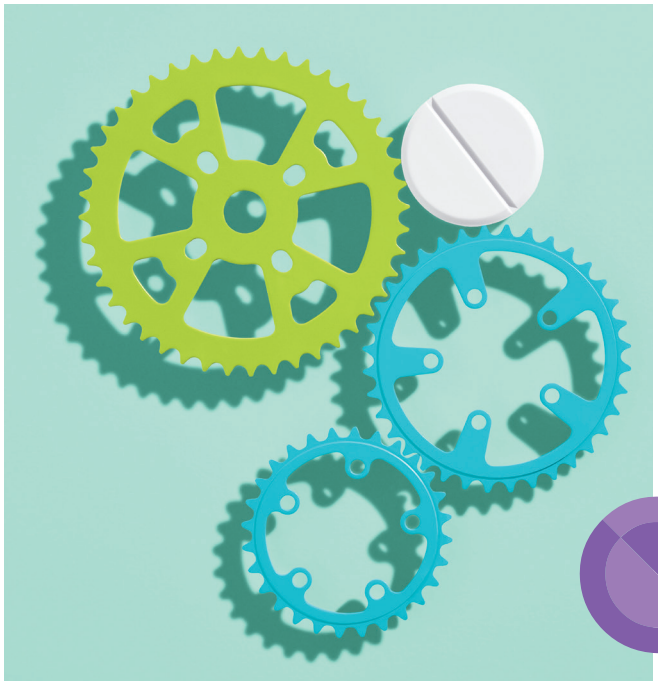
key features and benefits

- ultra fine particle size
- exceptional plasticity
- outstanding compressibility
- enhanced tablet strength
- low friability even at low usage levels
- low impact on disintegration time

ultra fine particle size

Klucel™ EXF Ultra HPC has significantly lower typical particle size ranges, to enhance performance.

	average		
binder	D10 (µm)	D50 (µm)	D90 (µm)
Klucel™ EXF Ultra HPC	4–12	15-30	35-75
Klucel™ EXF HPC	10–35	45-90	100-300



exceptional plasticity

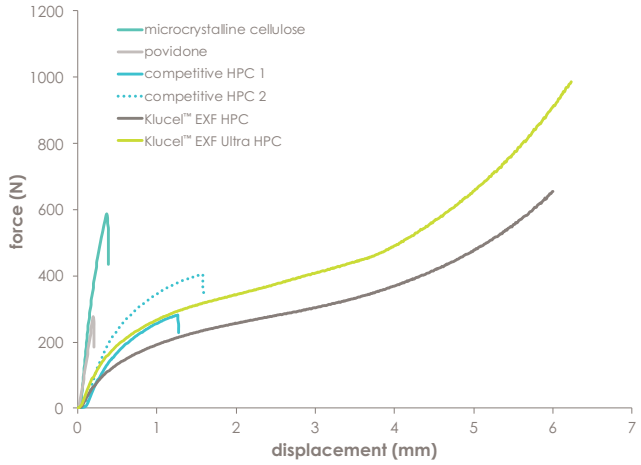
Klucel™ EXF Ultra HPC exhibits exceptional plasticity, to enable higher binder efficiency—leading to enhanced tablet strength and low friability at lower usage levels.

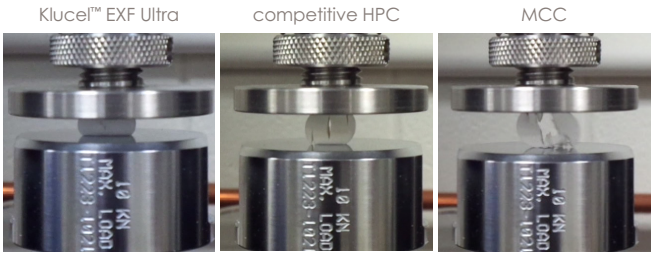
Need even smaller, stronger tablets with good disintegration time? Adding just small amounts of highly plastic Klucel™ EXF Ultra HPC (1 to 2%) improves compaction behavior and friability of poorly compressible blends with low impact on disintegration time.

outstanding compressibility

Exceptional plasticity and toughness result in outstanding compressibility. Unlike other binders, tablets of Klucel™ HPC never actually break, they just deform. Klucel™ EXF Ultra HPC withstands significantly greater breaking forces.

Pure polymer tablets of 400 mg each were made on the STYLCAM compaction simulator using standard 11.28 mm flat-faced punches, then subjected to diametral compression testing using Instron. Polymers used were microcrystalline cellulose (MCC), two grades of competitive HPC, Klucel™ EXF HPC and Klucel™ EXF Ultra HPC. We were unable to cause the tablets made of Klucel™ HPC to break.





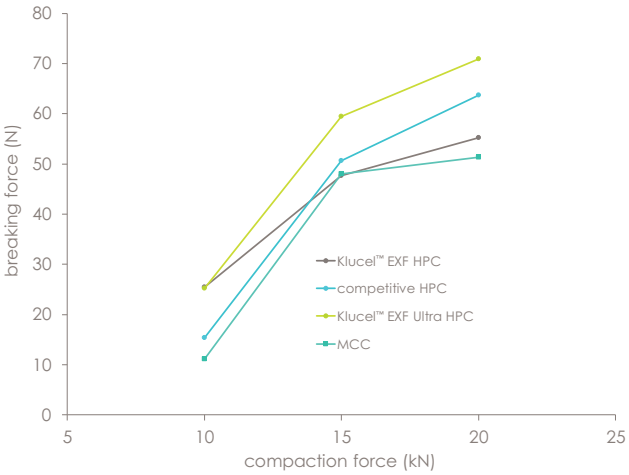
case study

roller compaction of metformin HCl tablets

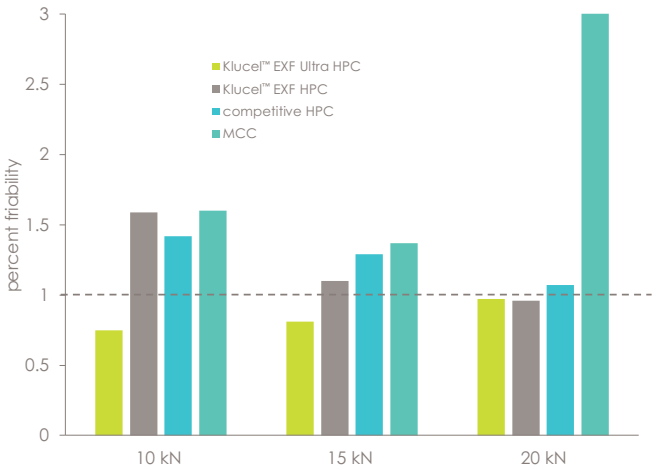
Binders used in this study were Klucel™ EXF HPC, Klucel™ EXF Ultra HPC, microcrystalline cellulose, and a competitive HPC. Tablets were made on the STYL'ONE compaction simulator with standard 11 mm concave tooling using the formulation shown in the table.

ingredients	wt %	mg/tablet
Metformin HCl	75.8	500
Mannitol	17.8	117.4
binder	6	39.6
Mg stearate	0.4	3
total	**100.0**	**660**

Klucel™ EXF Ultra HPC exhibits exceptional tablet strength, even with poorly compressible metformin.



Klucel™ EXF Ultra HPC provides low friability even at low compaction force.



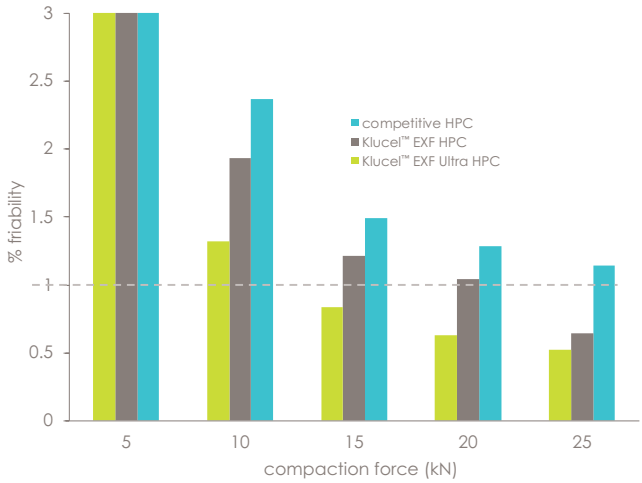
case study

direct compression of acetaminophen tablets

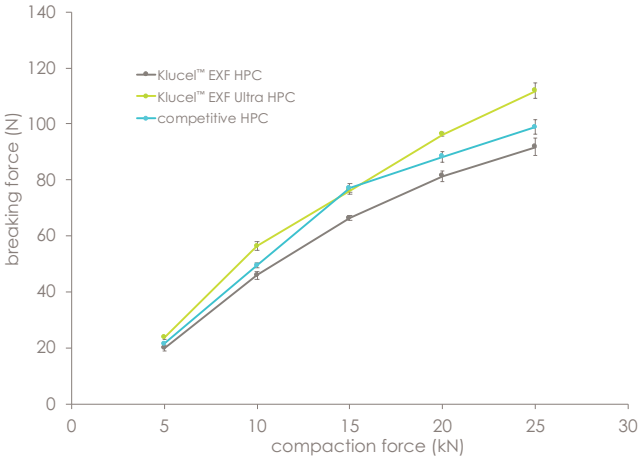
Klucel™ EXF Ultra HPC exhibits exceptional binder efficiency with enhanced tablet strength and low friability at lower usage levels. Tablets were made on a STYLCAM compaction simulator using direct compression and 11.28 mm flat faced punch and die, according to the formulation listed in the table. Binders used were Klucel™ EXF HPC, Klucel™ EXF Ultra HPC, and a competitive HPC.

ingredients	wt%	mg/tablet
acetaminophen DC	80	320
MCC	18	72
binder	1.5	6
magnesium stearate	0.5	2
total	**100**	**400**

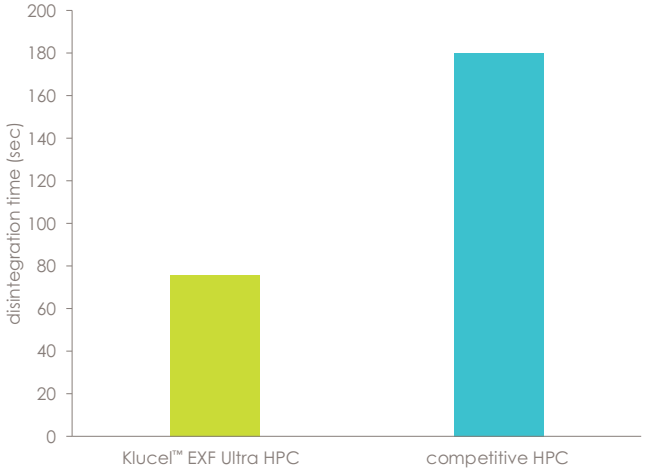
Klucel™ EXF Ultra HPC exhibits very low friability at all compaction forces. Less than 1% friability is achieved at 15 kN and higher with a usage rate of only 1.5%.



The breaking force of tablets made with Klucel™ EXF Ultra HPC is greater than that of Klucel™ EXF HPC and the competitive HPC at typical compaction forces.



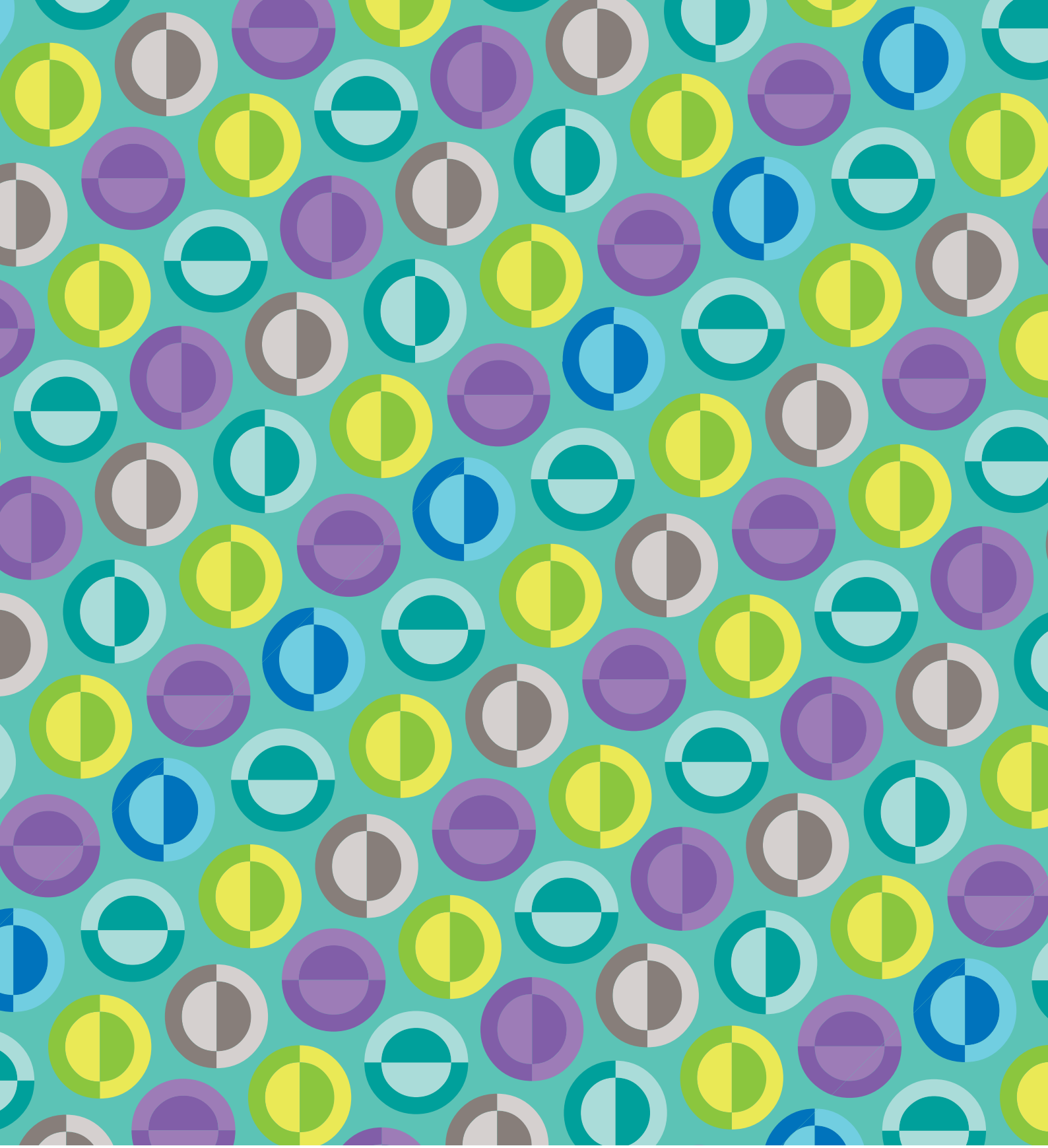
Klucel™ EXF Ultra HPC exhibits less impact on disintegration time than competitive HPC at low usage rates (1.5 wt %).



Klucel™ EXF Ultra HPC provides higher binder efficiency for enhanced tablet strength and low friability, with even the most difficult to compress active pharmaceutical ingredients.

Klucel™ EXF Ultra HPC takes binder efficiency to the next level.

Ashland
always solving



regional centers

North America
Wilmington, DE USA
Tel: +1 877 546 2782

Europe
Switzerland
Tel: +41 52 560 55 00

India
Maharashtra
Tel: +91 22 61489696

Asia Pacific
Singapore
Tel: +65 6775 5366

Middle East, Africa
Istanbul, Turkey
Tel: +00 90 216 538 08 00

Latin America
Mexico
Tel: +52 55 52 76 6121

ashland.com/contact

Ashland™
always solving