product grades available

The regulatory compliance information for all Ashland products varies by product family and grade. For specific data about the grade you are interested in please refer to our product regulatory data sheets or the Certificate of Analysis (CoA), which are available from your Ashland sales representative.

klucel™ hydroxypropylcellulose (HPC)

grade (X = fine)	weight average molecular weight	typical Brookfield viscosity (mPa•s)	solution concentration (%)
HF Pharm, HXF Pharm	1,150,000	1,500–3,000	1
MF Pharm, MXF Pharm	850,000	4,000–6,500	2
GF Pharm, GXF Pharm	370,000	150–400	2
JF Pharm, JXF Pharm	140,000	150–400	5
LF Pharm, LXF Pharm	95,000	75–150	5
EF Pharm, EXF Pharm, EXF Ultra Pharm	80,000	300–600	10
ELF Pharm	40,000	150–300	10

plasdone™ povidone

grade[a]	weight average molecular weight[b]	K-value viscosity
K-12	4,000	10.2–13.8
K-17	10,000	16.0–17.5
K-25	34,000	24–26
K-29/32	58,000	29–32
K-90	1,300,000	85–95
C-12	4,000	10.2–13.8
C-15	9,400	15.5–17.5
C-17	10,000	16.0–17.5
C-30	58,000	29.0–32.0

[a] C grades have low pyrogen levels [b]Absolute molecular weight (SEC/MALLS) [a] Available in fine and coarse particle sizes [b] NF/EP/JP viscosity method

plasdone™ copovidone

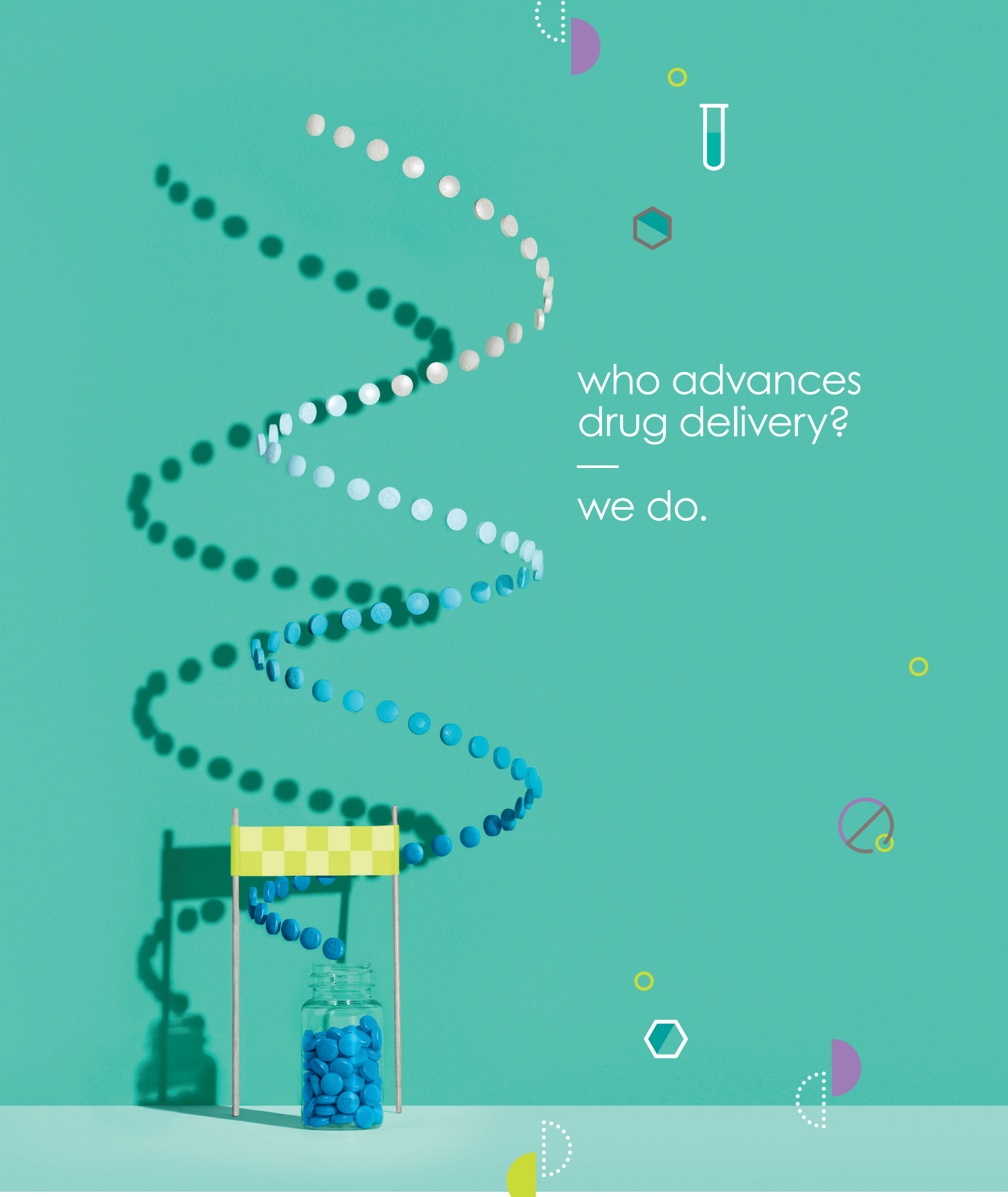
grade	weight average molecular weight[a]	K-value viscosity
S-630	43,000	25.0–31.0
S-630 Ultra	34,000	23.4–28.6

[a]Absolute molecular weight (SEC/MALLS)

polyplasdone™ crospovidone

grade	typical average particle size (microns)	peroxide specification (ppm)
Ultra[1]	110–140	30 Max
XL[1]	110–140	400 Max
Ultra-10[2]	25–40	50 Max
XL-10[2]	25–40	400 Max
INF-10[2]	10–15	400 Max

[1]Crospovidone monograph type A [2]Crospovidone monograph type B



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benecel™ hypromellose (HPMC)

substitution type	grade	weight average molecular weight	solution concentration	nominal viscosity (mPa•s)[a]
Hypromellose 2910 "E" types	E4M Pharm, E4M Pharm CR	400,000	2%	2,700–5,040
	E10M Pharm, E10M Pharm CR	746,000	2%	7,500–14,000
Hypromellose 2208 "K" types	K100LV PH PRM	164,000	2%	80–120
	K250 PH PRM	200,000	2%	200–300
	K750 PH PRM	250,000	2%	562–1050
	K1500 PH PRM	300,000	2%	1,125–2,100
	K4M Pharm XR, K4M Pharm XRF	400,000	2%	2,700–5,040
	K15M Pharm XR, K15M Pharm XRF	575,000	2%	13,500–25,200
	K35M Pharm	675,000	2%	26,250–49,000
	K100M Pharm XR, K100M Pharm XRF	1,000,000	2%	75,000–140,000
	K200M Pharm XR	1,200,000	2%	150,000–280,000

[a]NF/EP/JP viscosity method

benecel™ directly compressible hypromellose (HPMC)

substitution type	grade	weight average molecular weight	solution concentration	nominal viscosity (mPa•s)[a]
Hypromellose 2208 "K" types	K4M PH DC[1]	400,000	2%	2,700–5,040
	K15M PH DC[1]	575,000	2%	13,500–25,200
	K100M PH DC[1]	1,000,000	2%	75,000–140,000

[a]NF/EP/JP viscosity method [1]These grades are co-processed with silica at <1 %

benecel™ methylcellulose (MC)

substitution type	grade	nominal viscosity (mPa•s)[a]
methylcellulose	A15 LV PH PRM	12–18
	A4C Pharm	300–560
	A15C Pharm	1,312–2,450
	A4M Pharm	2,700–5,040

[a]NF/EP/JP viscosity method

aquarius™ film coating systems for immediate release

grade	descriptor	detail
genesis*	-	ultra high-solids based on copovidone and cellulosic polymers that provides a strong film with high adhesion and smooth appearance
preferred*	HSC	high-solids coatings based on cellulosic polymers
preferred*	HSP	high-solids coatings based on copovidone with cellulosic polymers for significant improvements in adhesion and sprayable solids
prime*	-	coatings based on traditional cellulosic polymers
prime	LS	coatings based on lactose and cellulosic polymers with significant improvements in film adhesion
protect	-	label-friendly moisture, odor and taste guard
protect	MB	high-solids moisture barrier coatings based on polyvinyl alcohol (PVA) without the use of polyethylene glycol (PEG)
pva*	-	versatile coating systems with improved performance characteristics

*titanium dioxide free options available

aquarius™ film coating systems for enteric release

grade	descriptor	detail
control	ENA	delayed-release (enteric) coatings based on methacrylic acid-ethyl acrylate copolymer

aquarius™ film coating systems for controlled release

grade	descriptor	detail
control	ECD	aqueous dispersion for controlled release based on ethylcellulose
control	SRX	controlled release coatings based on ethylcellulose

aqualon™ sodium carboxymethylcellulose (CMC)

viscosity (mPa•s)	solution concentration	degree of substitution		
		0.7	0.9	1.2
1500 - 2800	1%	7HF PH		
1500 - 2800	1%	7H3F PH		
1500 - 2800	1%	7HOF PH		
1840 - 2760	2%		9M31F PH	
1340 - 2000	2%			12M31P
470 - 700	2%	7MF PH		
470 - 700	2%	7MF PH BET		
400 - 720	2%	7M8SF PH		
400 - 720	2%		9M8F PH	
30 - 45	2%	7LF PH		
30 - 45	2%	7LF PH BET		
133 - 199	4%	7L2P		
133 - 199	4%	7L2P BET		

blanose™ sodium carboxymethylcellulose (CMC)

viscosity (mPa•s)	solution concentration	degree of substitution		
		0.7	0.9	1.2
2500 -4500 6750 - 12600	NF: 1% EP: 2%	7H4XF PH		
2500 -4500 6750 - 12600	NF: 1% EP: 2%		9H4XF PH	
1500 - 2800 6750 - 12600	NF: 1% EP: 2%	7H3SF PH		
1500 - 2800 6750 - 12600	NF: 1% EP: 2%	7H3SXF PH		
1500 - 2800 6750 - 12600	NF: 1% EP: 2%	7HOF PH		
1500 - 2500 6750 - 12600	NF: 1% EP: 2%	7HF PH		
1500 - 2500 6750 - 12600	NF: 1% EP: 2%	7HXF PH		
1500 - 2500 3750 - 12600	NF: 1% EP: 2%	7HCF PH		
N/A 1500 - 3100	NF: N/A EP: 2%	7M31F PH		
2075 - 3100 N/A	NF: 2% EP: N/A			12M31P
2075 - 3100 N/A	NF: 2% EP: N/A			12M31XP
1500 - 3100 1425 - 2660	NF: 2% EP: 2%		9M31F PH	
1500 - 3100 1425 - 2660	NF: 2% EP: 2%		9M31XF PH	
530 - 790 N/A	NF: 1% EP: N/A			12M8P
400 - 600 415 - 770	NF: 2% EP: 2%	7MF PH		
400 - 600 415 - 770	NF: 2% EP: 2%	7MXF PH		
400 - 600 415 - 770	NF: 2% EP: 2%	7MCF PH		
320 - 480 375 - 700	NF: 2% EP: 2%	7M8SF PH		
320 - 480 375 - 700	NF: 2% EP: 2%	7M8SXF PH		
27 – 50 34 - 63	NF: 2% EP: 2%	7LP EP		

viatel™ bioresorbable polymers for drug delivery

product	polymer	*molar ratio (D,L LA: GA)	inherent viscosity range (dl/g)**	end group	product grade
PLGA	poly(D, L-lactide-co-glycolide)	50:50	0.1 – 0.3	acid / ester	Viatel™ DLG 5002 A/E
PLGA		50:50	0.2 – 0.4	acid / ester	Viatel™ DLG 5003 A/E
PLGA		50:50	0.4 – 0.6	acid / ester	Viatel™ DLG 5005 A/E
PLGA		50:50	0.6 – 0.8	acid / ester	Viatel™ DLG 5007 A/E
PLGA		50:50	0.8 – 1.0	acid / ester	Viatel™ DLG 5009 A/E
PLGA		50:50	1.0 – 1.2	acid / ester	Viatel™ DLG 5011 A/E
PLGA		50:50	1.2 – 1.4	acid / ester	Viatel™ DLG 5013 A/E
PLGA		55:45	0.2 – 0.4	acid / ester	Viatel™ DLG 5503 A/E
PLGA		55:45	0.4 – 0.6	acid / ester	Viatel™ DLG 5505 A/E
PLGA		65:35	0.2 – 0.4	acid / ester	Viatel™ DLG 6503 A/E
PLGA		75:25	0.1 – 0.3	acid / ester	Viatel™ DLG 7502 A/E
PLGA		75:25	0.2 – 0.4	acid / ester	Viatel™ DLG 7503 A/E
PLGA		75:25	0.4 – 0.6	acid / ester	Viatel™ DLG 7505 A/E
PLGA		75:25	0.6 – 0.8	acid / ester	Viatel™ DLG 7507 A/E
PLGA		75:25	0.8 – 1.0	acid / ester	Viatel™ DLG 7509 A/E
PLGA		75:25	1.0 – 1.2	acid / ester	Viatel™ DLG 7511 A/E
PLGA		75:25	1.2 – 1.4	acid / ester	Viatel™ DLG 7513 A/E
PLGA		85:15	0.1 – 0.3	acid / ester	Viatel™ DLG 8502 A/E
PLGA		85:15	0.2 – 0.4	acid / ester	Viatel™ DLG 8503 A/E
PLGA		85:15	0.4 – 0.6	acid / ester	Viatel™ DLG 8505 A/E
PLGA		85:15	0.6 – 0.8	acid / ester	Viatel™ DLG 8507 A/E
PLGA		85:15	0.8 – 1.0	acid / ester	Viatel™ DLG 8509 A/E
PLGA		85:15	1.0 – 1.2	acid / ester	Viatel™ DLG 8511 A/E
PLGA		85:15	1.2 – 1.4	acid / ester	Viatel™ DLG 8513 A/E
PDLLA	poly(D, L-lactide)	100:0	0.1 – 0.3	acid / ester	Viatel™ DL 02 A/E
PDLLA		100:0	0.2 – 0.4	acid / ester	Viatel™ DL 03 A/E
PDLLA		100:0	0.4 – 0.6	acid / ester	Viatel™ DL 05 A/E
PDLLA		100:0	0.6 – 0.8	acid / ester	Viatel™ DL 07 A/E
PDLLA		100:0	0.8 – 1.0	acid / ester	Viatel™ DL 09 A/E
PDLLA		100:0	1.0 – 1.2	acid / ester	Viatel™ DL 11 A/E
PDLLA		100:0	1.2 – 1.4	acid / ester	Viatel™ DL 13 A/E

**D, L-LA: D, L-lactide. GA: glycolide*

***Inherent viscosity ranges per grade can be narrowed to meet customer requirements*

viatel™ bioresorbable polymers for medical devices

product	polymer	*molar ratio (L: CL)	inherent viscosity range (dl/g)	end group	product grade
PLLA	Poly (L-lactide)	-	0.8 – 1.2	ester	Viatel™ L 10 E
PLLA		-	1.2 – 1.6	ester	Viatel™ L 14 E
PLLA		-	1.6 – 2.0	ester	Viatel™ L 18 E
PCL	Poly(ε-caprolactone)	-	1.0 – 1.4	ester	Viatel™ C 12 E
PCL		-	1.6 – 2.0	ester	Viatel™ C 18 E
PLCL	Poly(L-lactide-co-ε-caprolactone)	60:40	1.0 – 1.4	ester	Viatel™ LC 6012 E
PLCL		70:30	1.0 – 1.4	ester	Viatel™ LC 7012 E
PLCL		80:20	1.0 – 1.4	ester	Viatel™ LC 8012 E
PLCL		90:10	1.0 – 1.4	ester	Viatel™ LC 9012 E

** Molar ratio here only applies to PLCL copolymers: L: L-lactide, CL: ε-caprolactone*

aqualon™ ethylcellulose (EC)

grade	ethoxyl substitution (%)	weight average molecular weight	typical Brookfield viscosity (mPa•s)[1]	solution concentration (%)
T10 Pharm	49.6–51.0	75,000	8–11	5
N7 Pharm	48.0–49.5	65,000	6–8	5
N10 Pharm	48.0–49.5	75,000	8–11	5
N14 Pharm	48.0–49.5	120,000	12–16	5
N22 Pharm	48.0–49.5	140,000	18–24	5
N50 Pharm	48.0–49.5	160,000	40–52	5
N100 Pharm	48.0–49.5	215,000	80–105	5

[1]Viscosity measured in 80:20 mixture of toluene/ethanol

Ashland® EC pharm ultra

grade	typical Brookfield viscosity (mPa•s)[2]
N4	3.0 – 5.5
N7	6.0 – 8.0
N10	9.0 – 11.0
N14	12.5 – 15.5
N20	18.0 – 22.0
N45	41.0 – 49.0
N50	45.0 – 55.0
N100	90.0 – 110.0

[2] 5% solution of 80/20 mixture of toluene/ethanol

natrosol™ hydroxyethylcellulose (HEC)

grade (X = fine, W = superfine)	weight average molecular weight	typical Brookfield viscosity (mPa•s)	solution concentration
HHX Pharm, HHW Pharm	1,300,000	3,500–5,500	1%
HX Pharm, H Pharm	1,000,000	1,500–2,500	1%
M Pharm	720,000	4,500–6,500	2%
G Pharm	300,000	250–400	2%
L Pharm	90,000	75–150	5%

hydroxypropyl-β- and hydroxypropyl-γ-cyclodextrins

product and grade	weight average molecular weight	typical degree of substitution
CAVASOL* W7 HP Pharma	1,410	4.1–5.1
CAVITRON™ W7 HP5 Pharma	1,410	4.1–5.1
CAVITRON W7 HP7 Pharma	1,520	6.0–8.0
CAVASOL* W8 HP Pharma	1,574	3.5-4.9

*Registered trademark owned by Wacker Chemie AG. Ashland acts as a worldwide distributor for Wacker.

native cyclodextrin

product and grade	weight average molecular weight	cyclodextrin Type
CAVAMAX* W6 Pharma	973	α-cyclodextrin
CAVAMAX* W7 Pharma	1,135	β-cyclodextrin
CAVAMAX* W8 Pharma	1,297	γ-cyclodextrin

*Registered trademark owned by Wacker Chemie AG. Ashland acts as a worldwide distributor for Wacker.

pharmasolve™ n-methyl-2-pyrrolidone (NMP)

Pharmasolve NMP is a liquid used for crystal inhibition and solubility enhancement in parenteral applications and in veterinary medicine. Its viscosity is 1.7 cP.

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 62828700

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 6169
Brazil
Tel: +55 11 36 49 0435

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