

# 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	80,000	300–600	10
ELF Pharm	40,000	150–225	10

## plasdane™ povidone

grade <sup>a</sup>	weight average molecular weight <sup>b</sup>	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-17	10,000	16.0–17.5
C-30	58,000	29.0–32.0

<sup>a</sup> C grades have low pyrogen levels

<sup>b</sup> Absolute molecular weight (SEC/MALLS)

## aquasolve™ hypromellose acetate succinate (HPMCAS)

grade <sup>a</sup>	weight average molecular weight	nominal viscosity (mPa•s) <sup>b</sup>
L	114,700	2.4–3.6
M	103,200	2.4–3.6
H	75,100	2.4–3.6

<sup>a</sup> Available in fine and coarse particle sizes

<sup>b</sup> NF/EP/JP viscosity method

## plasdone™ copovidone

grade	weight average molecular weight <sup>a</sup>	K-value viscosity
S-630	47,000	25.0–31.0

<sup>a</sup>Absolute molecular weight (SEC/MALLS)

## polyplasdone™ crospovidone

grade	typical average particle size (microns)	peroxide specification (ppm)
Ultra <sup>1</sup>	110–140	30 Max
XL <sup>1</sup>	110–140	400 Max
Ultra-10 <sup>2</sup>	25–40	50 Max
XL-10 <sup>2</sup>	25–40	400 Max

<sup>1</sup>Ph. Eur. crospovidone monograph type A

<sup>2</sup>Ph. Eur. crospovidone monograph type B

## benecel™ hypromellose (HPMC)

substitution type	grade	weight average molecular weight	solution concentration	nominal viscosity (mPa•s) <sup>a</sup>
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, K4M Pharm CR	400,000	2%	2,700–5,040
	K15M Pharm, K15M Pharm CR, K15M PH PRM	575,000	2%	13,500–25,200
	K35M Pharm	675,000	2%	26,250–49,000
	K100M Pharm XR	1,000,000	2%	75,000–140,000
K200M Pharm	1,200,000	2%	150,000–280,000	

<sup>a</sup>NF/EP/JP viscosity method

## benecel™ directly compressible hypromellose (HPMC)

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

<sup>a</sup>NF/EP/JP viscosity method

<sup>1</sup>These grades are co-processed with silica at <1 %

## benecel™ methylcellulose (MC) and methylhydroxyethylcellulose (MHEC)

substitution type	grade	nominal viscosity (mPa•s) <sup>a</sup>
methylcellulose	A15 LV PH PRM	12–18
	A4C Pharm	300–560
	A15C Pharm	1,312–2,450
	A4M Pharm	2,700–5,040
methylhydroxyethylcellulose	ME 233 P Pharm	3,100–5,700

<sup>a</sup>NF/EP/JP viscosity method

## aquarius™ film coating systems

grade	descriptor	detail	class
preferred	HSC	high-solids coatings based on cellulosic polymers	aesthetic
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	
protect	-	label-friendly moisture, odor and taste guard	functional
control	ECD	aqueous dispersion for sustained release based on ethylcellulose	
control	ENA	delayed-release (enteric) coatings based on methacrylic acid-ethyl acrylate copolymer	
control	SRX	sustained release coatings based on ethylcellulose	

## aqualon™ sodium carboxymethylcellulose (CMC)

weight average molecular weight	viscosity (mPa•s)	solution concentration	degree of substitution		
			0.7	0.9	1.2
725,000	1,500–3,000	1%	7HF PH		
725,000	1,000–2,800	1%	7H3SF PH		
725,000	1,000–2,800	1%	7HOF PH		
395,000	1,500–3,100	2%		9M31F PH	
395,000	800–3,100	2%			12M31P
250,000	400–800	2%	7MF PH		
250,000	400–800	2%	CMC 7MF PH BET		
250,000	400–800	2%	7M8SF PH		
250,000	400–800	2%		9M8F PH	
90,500	25–50	2%	7LF PH		
90,500	25–50	2%	CMC 7LF PH BET		
49,000	50–200	4%	7L2P		
49,000	50–200	4%	CMC 7L2P BET		

## blanose™ sodium carboxymethylcellulose (CMC)

weight average molecular weight	viscosity (mPa•s)	solution concentration	degree of substitution		
			0.7	0.9	1.2
725,000	2,500–4,500	1%	7H4XF PH	9H4XF PH	
725,000	1,500–2,500	1%	7HF PH		
725,000	1,000–2,800	1%	7H3SF PH		
725,000	1,000–2,800	1%	7HOF PH		
395,000	1,500–3,100	2%	7M31F PH	9M31F PH	12M31P
395,000	200–800	2%	7M8SF PH		
395,000	1,200–1,800	2%		9M20F PH	
395,000	400–800	2%			12M8P
250,000	400–600	2%	7MF PH		
250,000	50–100	2%	7M1F PH		
90,500	25–50	2%	7LP EP		

## aqualon™ ethylcellulose (EC)

grade	ethoxyl substitution (%)	weight average molecular weight	typical Brookfield viscosity (mPa·s) <sup>1</sup>	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

<sup>1</sup>Viscosity measured in 80:20 mixture of toluene/ethanol

## Ashland® EC pharm ultra

grade	typical Brookfield viscosity (mPa·s) <sup>2</sup>
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

<sup>2</sup> 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.

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