

INEOS Oligomers

Indopol® Polybutene Specifications and Typical Properties

INDOPOL GRADE			L-2	L-3	L-6	L-8	L-14	H-7	H-8
SPECIFICATIONS PROPERTIES		METHOD/ASTM NUMBER (IF APPLICABLE)							
Viscosity (cSt)	Kinematic	D 445							
Min			3.0	3.9	5.8	13.5	24.0	11.0	14.5
Max			3.7	5.0	7.2	16.5	30.0	14.0	16.0
Temp (°C)			20	20	40	40	40	100	100
Colour (Hazen), max	Pt-Co Scale	mod. D 1209	50	50	50	50	50	50	50
Flash Point (°C), min	Pensky-Martens Closed cup	D 93	65	65	82	82	115	115	115
Water (ppm), max	Coulimetric Karl-Fischer	E 1064	40	40	40	40	40	40	40
Appearance (Clear & Bright)	Visual	n/a	C&B	C&B	C&B	C&B	C&B	C&B	C&B
TYPICAL PROPERTIES									
Molecular Weight (M _n)	Gel Permeation Chromatography	mod. D 3536	180	220	280	320	370	440	490
Polydispersity Index (M _w /M _n)	Gel Permeation Chromatography	mod. D 3536	-	-	1.10	1.65	1.30	1.80	1.85
Flash Point (°C)	Cleveland Open Cup Luchaire Closed Cup	D 92 NFT 60103	- >40	- >60	- >60	- >60	>138 -	>145 -	>141 -
Turbidity (NTU)	Nephelometric	D 5180	<4	<4	<4	<4	<4	<4	<4
Acid Number (mg KOH/g)	Titrimetric	D 974	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromine Number (g Br ₂ /100g)	Titrimetric	IP 129/87	87	83	64	57	52	40	38
Bromine Index (mg Br ₂ /100g)	Titrimetric	D 2710	-	-	-	-	-	-	-
Chlorine (ppm)	X-Ray Fluorescence	n/a	80	70	90	80	60	60	50
Metals (ppm):	Inductively Coupled Plasma Spec.	n/a							
Na			<1	<1	<1	<1	<1	<1	<1
K			<1	<1	<1	<1	<1	<1	<1
Fe			<1	<1	<1	<1	<1	<1	<1
Specific Gravity (at 15.5 °C)		D 1298	0.788	0.803	0.824	0.835	0.839	0.850	0.857
Glass Transition Temperature T _g (°C)	Differential Scanning Calorimetry	n/a	-	-	-	-	-90.5	-	-
Pour Point (°C)		D 97	< -60	< -60	< -60	< -60	-51	-36	-35
Viscosity Index		D 2270	-	-	-	-	60	90	-
Viscosity (SUS)	Kinematic	D 2161	36.9	40.6	47.1	76.5	136.5	67.8	80
Temp (°C)			20	20	40	40	40	100	100
Refractive Index		D 1218	1.445	1.452	1.461	1.467	1.470	1.474	1.478
Total Sulfur (ppm)	X-Ray Analysis	n/a	< 5	< 5	< 5	< 5	< 5	< 5	< 5

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INDOPOL GRADE			H-15	H-25	H-50	H-100	H-300	H-1200	H-1500
SPECIFICATIONS PROPERTIES									
	<i>METHOD/ASTM NUMBER (IF APPLICABLE)</i>								
Viscosity (cSt)	Kinematic	D 445							
Min			27.5	48.5	100	200	605	2300	2900
Max			33.5	55.5	115	235	655	2700	3200
Temp (°C)			100	100	100	100	100	100	100
Colour (Hazen), max	Pt-Co Scale	mod. D 1209	50	50	50	50	50	50	50
Flash Point (°C), min	Pensky-Martens Closed cup	D 93	115	125	135	155	160	165	170
Water (ppm), max	Coulometric Karl-Fischer	E 1064	40	40	40	40	40	40	40
Appearance (Clear & Bright)	Visual	n/a	C&B	C&B	C&B	C&B	C&B	C&B	C&B
TYPICAL PROPERTIES									
Molecular Weight (M _n)	Gel Permeation Chromatography	mod. D 3536	570	635	800	910	1300	2100	2200
Polydispersity Index (M _w /M _n)	Gel Permeation Chromatography	mod. D 3536	1.85	2.10	1.60	1.60	1.65	1.80	1.75
Flash Point (°C)	Cleveland Open Cup Luchaire Closed Cup	D 92 NFT 60103	>141 -	>150 -	>190 -	>210 -	>240 -	>250 -	>250 -
Turbidity (NTU)	Nephelometric	D 5180	<4	<4	<4	<4	<4	<4	<4
Acid Number (mg KOH/g)	Titrimetric	D 974	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromine Number (g Br ₂ /100g)	Titrimetric	IP 129/87	29	27	20	16.5	12	9	8
Bromine Index (mg Br ₂ /100g)	Titrimetric	D 2710	-	-	-	-	-	-	-
Chlorine (ppm)	X-Ray Fluorescence	n/a	50	50	50	40	60	130	100
Metals (ppm): Na K Fe	Inductively Coupled Plasma Spec.	n/a	<1 <1 <1	<1 <1 <1	<1 <1 <1	<1 <1 <1	<1 <1 <1	<1 <1 <1	<1 <1 <1
Specific Gravity (at 15.5 (°C))		D 1298	0.865	0.869	0.884	0.893	0.904	0.906	0.908
Glass Transition Temperature T _g (°C)	Differential Scanning Calorimetry	n/a	-	-	-	-69.6	-66.9	-	-64.6
Pour Point (°C)		D 97	-35	-23	-13	-7	3	15	18
Viscosity Index		D 2270	90	-	-	125	173	242	250
Viscosity (SUS) Temp (°C)	Kinematic	D 2161	142 100	241 100	500 100	1025 100	2950 100	11650 100	14230 100
Refractive Index		D 1218	1.485	1.486	1.490	1.494	1.497	1.502	1.502
Total Sulfur (ppm)	X-Ray Analysis	n/a	< 5	< 5	< 5	< 5	< 5	< 5	< 5

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Indopol® Polybutene Specifications and Typical Properties

INDOPOL GRADE			H-1900	H-2100	H-6000	H-18000	PANALANE L-14E	PANALANE H-300E
SPECIFICATIONS PROPERTIES		METHOD/ASTM NUMBER (IF APPLICABLE)						
Viscosity (cSt)	Kinematic	D 445						
Min			3900	3900	11100	36000	27.0	605
Max			4200	4600	13300	45000	34.0	655
Temp (°C)			100	100	100	100	38	99
Colour (Hazen), max	Pt-Co Scale	mod. D 1209	50	50	100	100	10	20
Flash Point (°C), min	Pensky-Martens Closed cup	D 93	170	170	175	180	115*	160*
Water (ppm), max	Coulimetric Karl-Fischer	E 1064	40	40	40	40	40*	40*
Appearance (Clear & Bright)	Visual	n/a	C&B	C&B	C&B	C&B	C&B*	C&B*
TYPICAL PROPERTIES								
Molecular Weight (M _n)	Gel Permeation Chromatography	mod. D 3536	2500	2500	4200	6000	370	1300
Polydispersity Index (M _w /M _n)	Gel Permeation Chromatography	mod. D 3536	1.80	1.85	1.80	1.70	1.30	1.65
Flash Point (°C)	Cleveland Open Cup Luchoire Closed Cup	D 92 NFT 60103	>270 -	>270 -	>275 -	>280 -	>138 -	>235 -
Turbidity (NTU)	Nephelometric	D 5180	<4	<4	<4	<4	<2	<3
Acid Number (mg KOH/g)	Titrimetric	D 974	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
Bromine Number (g Br ₂ /100g)	Titrimetric	IP 129/87	6.5	6.5	4	3	-	-
Bromine Index (mg Br ₂ /100g)	Titrimetric	D 2710	-	-	-	-	1000**	1000**
Chlorine (ppm)	X-Ray Fluorescence	n/a	100	-	-	-	<1	<1
Metals (ppm): Na K Fe	Inductively Coupled Plasma Spec.	n/a	<1 <1 <1	<1 <1 <1	<1 <1 <1	<1 <1 <1	<1 <1 <1	<1 <1 <1
Specific Gravity (at 15.5 (°C))		D 1298	0.912	0.912	0.918	0.921	0.825	0.885
Glass Transition Temperature T _g (°C)	Differential Scanning Calorimetry	n/a	-	-	-	-	-	-
Pour Point (°C)		D 97	21	21	35	50	-51	2
Viscosity Index		D 2270	267	267	306	378	60	173
Viscosity (SUS) Temp (°C)	Kinematic	D 2161	18850 100	19800 100	56800 100	188500 100	138 40	2930 100
Refractive Index		D 1218	1.504	1.504	1.505	1.508	1.464	1.498
Total Sulfur (ppm)	X-Ray Analysis	n/a	< 5	< 5	< 5	< 5	< 5	< 5

* = not specification properties for Panalane
** = specification property for Panalane

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