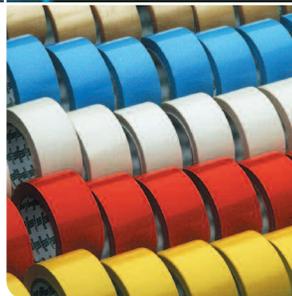
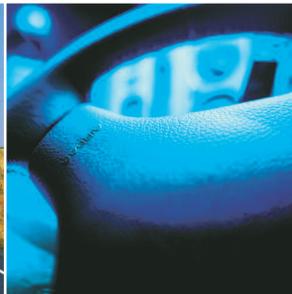


# Kraton Polymers and Compounds

## Typical Properties Guide





## What are Kraton® polymers? Strong. Flexible. Elastic. Versatile.

Kraton® polymers are high performance thermoplastic elastomers engineered for a wide spectrum of end uses. The versatility of Kraton polymers is due to their distinctive molecular structure, which can be precisely controlled and tailored to perform in specific applications. Wide latitudes in compounding further expand the application of this extremely useful polymer.

There are three different families of Kraton polymers (Kraton D, Kraton G and Kraton IR), each of which has its own distinct performance characteristics, which make them particularly well-suited for specific applications. Kraton D and Kraton G are both styrenic block copolymers while Kraton IR constitutes a family of high molecular weight polyisoprene rubbers.

Kraton D and G polymers have a combination of high strength and low viscosity for easy thermoplastic processing at elevated temperatures or in solution. Their strength can be equal to that of vulcanized rubber, yet they do not require vulcanization. They have a Shore A hardness range from 11 to 91 and tensile strengths from 50 to 5,000 psi. Kraton polymers are readily dissolved in certain solvents, and remain flexible at temperatures as low as -80°C.

Many grades can be used in FDA-regulated products that have contact with food. Kraton polymers are also adaptable to electrical applications, as they can provide good insulation. They are highly extendible with fillers, resins and oils, which can allow them to be formulated into a wide hardness range for pressure sensitive adhesives, sealants, polymer-modified asphalts or even flexible oil gels. The neat polymer is clear and colorless, and in certain cases remains clear when compounded. It is also highly colorable.

Kraton IR polymers are special polyisoprene elastomers that can be processed in the same way as Natural Rubber (NR), including vulcanization. They combine the key qualities of NR such as good mechanical properties, hysteresis and temperature resistance with additional features such as high purity, light color, good flow, low gel content, no nitrosamines, and no natural rubber proteins.

As additives, Kraton D and G polymers can improve the impact toughness of plastics, the high and low temperature performance of asphalts, or the shrink characteristics of polyester thermosets. At higher concentrations, Kraton D, G, and IR polymers can also improve the flexibility, softness, elasticity and feel of certain plastics.

The versatility of Kraton polymers can be seen in the numerous processing techniques in which they are used: injection molding, blow molding, compression molding, extrusion, calendaring, hot melt, and solution-applied coatings. In all these processes, Kraton polymers can be reprocessed without losing their physical properties.

## Kraton polymers and compounds are versatile performers.

Kraton styrenic block copolymers are classified into three categories. Those with an unsaturated rubber mid-block constitute Kraton D polymers, while those with a saturated mid-block make up Kraton G polymers. Kraton IR polymers are polyisoprene elastomers.

Both the D and G series polymers are elastic and flexible. They have a wide range of properties, can be easy to process using thermoplastic processing methods, have good electrical resistance properties, and are reprocessable.

Kraton G polymers can give the added advantages of increased oxidation and weather resistance, higher service temperatures and increased processing stability.

Kraton IR polymers can be used in virtually all segments where NR is traditionally present, while adding value through their unique features. They can also be utilized in applications where NR has never been used, e.g. when high purity and/or well-defined molecular structures are required.

## Their unique structure is the essence of Kraton polymers' versatility.

The versatility of Kraton polymers stems from the unique molecular structure of the linear diblock, triblock and radial polymers. Kraton IR polymers are linear polyisoprene homopolymers while each molecule of Kraton D and G polymers consists of block segments of styrene monomer units and rubber monomer units. Each molecule of Kraton polymers consists of block segments of styrene monomer units and rubber monomer units. Each block segment may consist of 100 monomer units or more. The most common structures are the linear A-B-A block types: styrene-butadiene-styrene (SBS), styrene-isoprene-styrene (SIS), which are Kraton D polymers, and a second generation of the styrene-ethylene/butylene-styrene type (SEBS) or styrene-ethylene/propylene-styrene (SEPS), which are Kraton G polymers.

In addition to the A-B-A type polymers, there are specialized polymers of the radial (A-B)<sub>n</sub> type: (styrene-butadiene)<sub>n</sub> or (styrene-isoprene)<sub>n</sub>, and diblock (A-B) type: styrene-butadiene (SB), styrene-ethylene/propylene (SEP) and styrene-ethylene/butylene (SEB). *See Diagram 1.*

The A-B-A molecular structure of Kraton polymers has polystyrene end-blocks and an elastomeric mid-block. Prior to processing, the polystyrene end-blocks are associated in rigid domains. "Physical crosslinking" via these domains yields a continuous three-dimensional network. During processing, in the presence of heat and shear or solvent, the polystyrene domains soften and permit flow. After cooling or solvent evaporation, the polystyrene domains reform and harden, locking the rubber network in place. *See Diagram 2.*

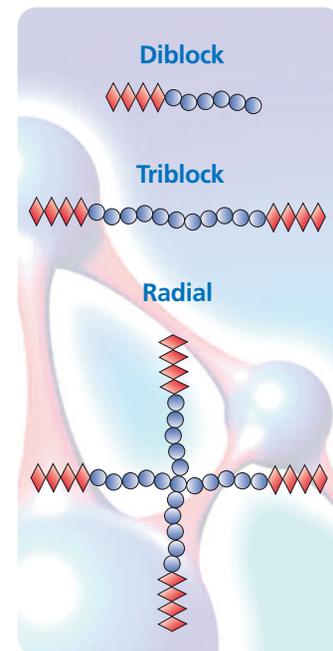
This "physical crosslinking" and the reinforcing effect of the styrene domains give Kraton polymers their high tensile strength. The rubber mid-block gives them their elasticity. Since the "physical crosslinking" is reversible, Kraton polymers can be reprocessed.

The Kraton polymers diblock is an A-B structure, or diblock of styrene and rubber. This structure can provide unique rheology characteristics in solvents, asphalts or oil over a broad range of temperatures, balanced adhesive and cohesive strengths, and generally lower viscosity and improved mixability.

**Hardness** In most cases, the degree of rubberiness of Kraton polymers is reflected by the Shore Hardness data shown in the charts on pages 10-20. The Shore A can range from 11 to 91 in the various Kraton D polymer and Kraton G polymer grades.

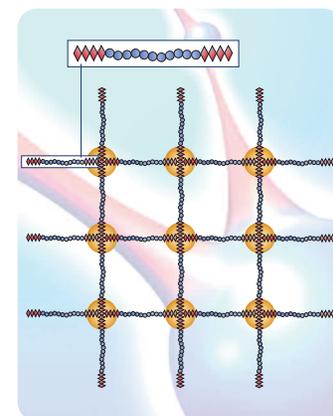
**Heat Resistance** Generally, Kraton D polymer compounds will remain functional in temperatures up to 70°C, depending on load conditions. Kraton G polymer compounds can withstand higher temperature service. They can be steam sterilized, and some grades may be used in temperatures up to 150°C under certain service conditions.

*Diagram 1:*  
*Backbone Structures*



Kraton Polymers

*Diagram 2: Network*



Kraton Polymers



**Weatherability** Kraton G polymer compounds exhibit good ozone resistance and can withstand prolonged outdoor exposure applications.

**Chemical Resistance** All Kraton polymer products have good resistance to water, acids and bases. Soaking in hydrocarbon solvents and oils will deteriorate both grades; however, short exposures can be tolerated.

**Moldability** Generally, Kraton D polymer compounds react the same as other easy-molding thermoplastics with comparable melt flows (such as polystyrene). The molding process for compounds will use the same equipment as thermoplastics (i.e. polypropylene); however, Kraton polymer compounds are more shear sensitive (see Kraton Polymers Processing Guide, K0107 OTd-02U).

**Handling Precautions** Normal procedures for handling solids that might form a dust should be followed when handling and storing Kraton polymer pellets and powder. Compounding of Kraton polymers in high shear equipment can cause the temperature to rise. See Precautions statement on the back of this brochure for temperature guidelines. Refer to the Material Safety Data Sheet of a specific Kraton polymer product for further safety information.

**FDA** When this designation is used in the charts, it means that this product can find use under certain FDA regulations as an article or as a component of an article intended for food contact applications. FDA clearances vary from one grade to another. For specific clearances, letters of certification will be provided upon request.

## Kraton polymers selector guide.

Kraton D polymer and Kraton G polymer grades are either pure polymer (1000 series) or oil-modified polymer (4000 series). These grades are most suitable as performance modifiers in blends with thermoplastics, thermosets and asphalts, for use in general compounding applications, or as the base polymer for adhesive, sealant or coating formulations.

Kraton D polymer compounds and Kraton G polymer compounds are formulations containing block copolymers and other suitable ingredients (2000 and 7000 series). These compounds offer a wide range of properties and provide the benefits of rubberiness and ease of processing on standard thermoplastic processing equipment. They can also offer softness for good feel and low temperature flexibility.

Kraton IR polymers are also available as either pure polymer or oil-extended polymer. For the pre-selection of Kraton IR polymers, please use table on page 5. Additional information can be found in the Kraton IR Elastomers Fact Sheet and the four individual Data Sheets.

To simplify the selection of either a Kraton D polymer or Kraton G polymer grade, please refer to the series that contains the physical properties best suited for a particular application (as shown on pages 4-14). End-use applications by grade are shown in the following table.

# End Use Applications

Simplified selection of Kraton polymer grades. Please refer to the series that contains the physical properties best suited for a particular application.

Kraton D Polymer Families					
Series	1100	1400	2100	3100	4100 <sup>1</sup>
<b>Pure Polymer</b> For use as a major compounding ingredient or additive					
<b>Modified Asphalts</b>	●				●
<b>Polymer Modification/Packaging</b>	●	●			●
<b>Adhesives/Sealants/Coatings</b>	●				●
<b>Thermoset Modification</b>	●				
<b>Oil Gels</b>					
<b>General Elastomer Compounding</b>	●	●			●
<b>Compounds</b> Directly injection moldable or extrudable					
<b>Modified Asphalts</b>				●	
<b>Adhesives/Sealants/Coatings</b>					
<b>Automotive Parts/ Sporting Goods/Molded Items</b>		●	●		
<b>Medical/Packaging</b>		●	●		
<b>Film</b>		●	●		

1. Oiled polymer.

2. Functionalized Kraton G polymers, e.g., Kraton FG-1901 polymer.

Kraton Polymers

Kraton G Polymer Families						
1600	1700	1900 <sup>2</sup>	2700	2800	4600 <sup>1</sup>	7000
●	●	●				
●	●	●				
●	●	●				
	●	●				
●	●				●	
●	●	●			●	
						●
			●	●		●
			●	●		
				●		

Kraton Polymers

# Kraton D (IR) Summary of properties.

These are typical values and should not be used to set specifications.

Kraton D (IR) Polymer Grades					
Property	IR305 (I) Linear	IR307 (I) Linear	IR309 <sup>1,2</sup> (I) Linear	IR310 <sup>1,3</sup> (I) Linear	IR401 <sup>4</sup> (I) Latex Linear
Specific Gravity	0.91	0.91	0.91	0.91	—
Intrinsic Viscosity, dl/g	7.8	7.8	8.0	8.0	7.8
Mooney Viscosity, MV	—	—	45	45	—
Oil Content, %w	3.6	0	3.6	0	—
Styrene/Rubber Ratio	0/100	0/100	0/100	0/100	0/100
Physical Form	Bale	Bale	Bale	Bale	Latex
Comments	—	FDA	Bimodal MW distribution	FDA	FDA

1. Lower viscosity.

2. Easy processing version of IR305.

3. Easy processing version of IR307.

4. 63% solids in latex (aqueous dispersion).

Kraton Polymers

# Kraton D (SIS) Summary of properties.

These are typical values and should not be used to set specifications.

Kraton D (SIS) Polymer Grades											
Property	D1111K (SIS) Linear	D1113P (SIS) Linear	D1114P (SIS) Linear	D1117P (SIS) Linear	D1119P (SIS) Linear	D1124K (SI) <sub>n</sub> Radial	D1126P (SI) <sub>n</sub> Radial	D1161P (SIS) Linear	D1162BT (SIS) Linear	D1163P (SIS) Linear	D1164P (SIS) Linear
Tensile Strength, psi <sup>1,2</sup>	2,900	600	4,600	1,200	350	2,100	1,120	3,100	4,000	1,500	4,000
300% Modulus, psi <sup>1,2</sup>	200	50	275	60	160	430	360	130	—	70	445
Elongation, % <sup>1,2</sup>	1,200	1,500	1,300	1,300	1,000	1,100	1,400	1,300	—	1,400	1,000
Set at Break, % <sup>1,2</sup>	10	20	—	15	20	26	—	—	—	—	—
Hardness, Shore A <sup>3</sup> (10 sec.)	45	23	42	33	30	54	44	32	—	25	53
Specific Gravity	0.93	0.92	0.92	0.92	0.93	0.94	0.92	0.92	0.95	0.92	0.94
Brookfield Viscosity <sup>4</sup> cps at 77°F	1,100	600	900	500	340	340	500	1,200	120	900	300
Melt Index gms/10 min. (200°C/5kg)	3	24	9	33	25	4	15	12	35	23	12
Oil Content, %w	0	0	0	0	0	0	0	0	0	0	0
Styrene/Rubber Ratio	22/78	16/84	19/81	17/83	22/78	30/70	19/81	15/85	44/56	15/85	29/71
Physical Form	Porous Pellet	Dense Pellet	Dense Pellet	Dense Pellet	Dense Pellet	Porous Pellet	Dense Pellet	Dense Pellet	Porous Pellet	Dense Pellet	Dense Pellet
Diblock, %	18	55	<1	33	66	30	30	19	<1	38	<1
Comments	FDA	FDA	FDA	FDA	FDA	FDA	FDA	FDA replaces D1107	FDA	FDA replaces D1112	FDA

1. ASTM method D412 — tensile tester jaw separation speed 10 in./min.
2. Typical properties determined on film cast from toluene solution.
3. Typical values on polymer compression molded at 350°F.
4. Neat polymer concentration, 25%w in toluene.

The actual manufacturing location is indicated by a suffix in the grade name, e.g. D-1101K.  
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 'B' Brazil (Paulinia) and  
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Kraton Polymers

# Kraton D (SIS, SBS) Summary of properties.

These are typical values and should not be used to set specifications.

Kraton D (SIS) Polymer Grades		
Property	D1165P (SIS) Linear	D1193P (SIS) Linear
Tensile Strength, psi <sup>1,2</sup>	3,000	2,600
300% Modulus, psi <sup>1,2</sup>	390	370
Elongation, % <sup>1,2</sup>	1,200	1,200
Set at Break, % <sup>1,2</sup>		20
Hardness, Shore A <sup>3</sup> (10 sec.)	54	53
Specific Gravity	0.94	0.93
Brookfield Viscosity <sup>4</sup> cps at 77°F	340	400
Melt Index gms/10 min. (200°C/5kg)	8	14
Oil Content, %w	0	0
Styrene/Rubber Ratio	30/70	24/76
Physical Form	Dense Pellet	Dense Pellet
Diblock, %	20	20
Comments	FDA	FDA

1. ASTM method D412 — tensile tester jaw separation speed 10 in./min.
2. Typical properties determined on film cast from toluene solution.
3. Typical values on polymer compression molded at 350°F.
4. Neat polymer concentration, 25%w in toluene.
5. Results measured on oil extended film cast from toluene and then extrapolated to zero oil content.

Kraton D (SBS) Polymer Grades								
D1101K (SBS) Linear	D1102K (SBS) Linear	D1116K (SBS) Radial	D1118K (SBS) Diblock	D1133K (SBS) Linear	D1153E (SBS) Linear	D1155BJ (SBS) Linear	D1184K (SBS) Radial	D1192E (SBS) Linear
4,600	4,600	4,600 <sup>5</sup>	250	—	4,000	4,000	4,000	—
400	400	350	175	—	420	420	800	—
880	880	900	600	—	800	800	820	—
10	10	10	40	—	—	—	10	—
69	66	63	64	74	70	87	68	66
0.94	0.94	0.94	0.94	0.94	0.94	0.96	0.94	0.94
4,000	1,100	9,000	630	4,800	1,650	600	20,000	1,500
<1	14	<1	10	<1	3	14	<1	<1
0	0	0	0	0	0	0	0	0
31/69	28/72	23/77	33/67	36/64	29/71	40/60	31/69	30/70
Porous Pellet, Powder	Porous Pellet	Porous Pellet, Powder	Porous Pellet, Powder	Porous Pellet, Powder	Porous Pellet	Porous Pellet	Porous Pellet, Powder	Porous Pellet, Powder
16	17	16	78	34	<1	<1	16	<1
FDA	FDA	FDA	FDA	FDA	FDA	FDA	FDA	FDA

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Kraton Polymers

# Kraton D (SBS) Summary of properties.

These are typical values and should not be used to set specifications.

Kraton D (SBS) Polymer Grades		
Property	D1403P (SBS) Radial	D1493P (SBS) Radial
Tensile Strength, psi <sup>1,5</sup>	4,000	4,000
Flexural Modulus, psi <sup>1,5</sup>	270,000	270,000
Elongation, % <sup>1,5</sup>	200	200
HDT@66psi (°C) <sup>5</sup>	80	80
Hardness Shore D <sup>5</sup> , ASTM D2240	65D	65D
Specific Gravity, gm/cc	1.01	1.01
Brookfield Viscosity <sup>4</sup> , cps at 77°F	220	220
Melt Index gms/10 min. (200°C/5kg)	11	11
Oil Content, %w	0	0
Styrene/Rubber Ratio	75/25	75/25
Physical Form	Dense Pellet (with wax)	Dense Pellet (unwaxed)
Comments	FDA	FDA

1. ASTM method D638 — tensile tester jaw separation speed 2 in./min.

Kraton Polymers

2. Typical properties determined on film cast from toluene solution.

3. Typical values on polymer compression molded at 350°F.

4. Neat polymer concentration, 25%w in toluene.

5. Injection molded sample.

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# Kraton D Oiled

Summary of properties.

These are typical values and should not be used to set specifications.

Kraton Oiled Polymer Grades				
Property	D4141K (SBS) Linear	D4150K (SBS) Linear	D4158K (SB) <sub>n</sub> Radial	D4433P (SIS) Linear
Tensile Strength psi <sup>1</sup>	2,750 <sup>3</sup>	2,800 <sup>3</sup>	1,330 <sup>3</sup>	900 <sup>2</sup>
300% Modulus, psi <sup>1</sup>	250	160	230	150
Elongation, % <sup>1</sup>	1,300	1,400	1,110	1,450
Set at Break, % <sup>1</sup>	20	25	10	24
Hardness Shore A <sup>3</sup> (10sec.)	50	45	41	29
Specific Gravity	0.93	0.92	0.92	0.92
Brookfield Viscosity <sup>4</sup> , cps at 77°F	1,000	850	4,800	350
Melt Index gms/10 min. (200°/5kg)	11	10	<1	29
Oil Content, %w	28.5	33	33	23
Styrene/Rubber Ratio	31/69	31/69	31/69	22/78
Physical Form	Porous Pellet Powder	Porous Pellet	Porous Pellet	Dense Pellet
Diblock, %	17	17	16	20
Comments	FDA	FDA	FDA	FDA

1. ASTM method D412 — tensile tester jaw separation speed 10 in./min.

Kraton Polymers

2. Typical properties determined on film cast from toluene solution.

3. Typical values on polymer compression molded at 350°F.

4. Oil extended polymer concentration, 25%w in toluene.

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# Kraton G Summary of properties.

These are typical values and should not be used to set specifications.

Kraton G Polymer Grades							
Property		G1641H <sup>5</sup> (SEBS) Linear	G1650M (SEBS) Linear	G1651H (SEBS) Linear	G1652M (SEBS) Linear	G1654H (SEBS) Linear	G1657M (SEBS) Linear
Tensile Strength psi <sup>1,2</sup>		> 2,500	> 4,000	> 4,000	4,500	> 4,000	3,400
300% Modulus, psi <sup>1,2</sup>		630	800	—	700	—	350
Elongation, % <sup>1,2</sup>		> 800	500	> 800	500	> 800	750
Hardness Shore A (10sec.) <sup>3</sup>		52	72	61	70	63	47
Specific Gravity		0.92	0.91	0.91	0.91	0.91	0.89
Brookfield Viscosity, cps at 77°F	25%w <sup>4</sup>	>50,000	8,000	>50,000	1,800	>50,000	4,200
	10%w <sup>4</sup>	80	50	1,800	30	410	65
Melt Index gms/10 min. (5kg)	200°C	<1	<1	<1	<1	<1	8
	230°C	<1	<1	<1	5	<1	22
Oil Content, %w		0	0	0	0	0	0
Styrene/Rubber Ratio		34/66	30/70	33/67	30/70	31/69	13/87
Physical Form		Powder	Powder	Powder	Powder	Powder	Dense Pellet
Diblock, %		<1	<1	<1	<1	<1	29
Comments		FDA	FDA	FDA	FDA	FDA	FDA

1. ASTM method D412 — tensile tester jaw separation speed 10 in./min.

2. Typical properties determined on film cast from toluene solution.

3. Typical values on polymer compression molded at 350°F.

4. Neat polymer concentration, in toluene.

5. Enhanced rubber segment (lower viscosity, lower hardness, more compatibility with PP).

Kraton Polymers

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# Kraton G Summary of properties.

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Kraton G Polymer Grades							
Property		G1701M (SEP) Diblock	G1702 (SEP) Diblock	G1726M (SEBS) Linear	G1730M (SEPS) Linear	G1750M (EP) <sub>n</sub> Star	G1765M (EP) <sub>n</sub> Star
<b>Tensile Strength</b> psi <sup>1</sup>		300	300	350	—	< 50	< 50
<b>300% Modulus</b> , psi <sup>1</sup>		—	—	—	—	—	—
<b>Elongation</b> , % <sup>1</sup>		< 100	< 100	200	—	100	120
<b>Hardness Shore A</b> (10sec.) <sup>3</sup>		64	41	70	61	11	12
<b>Specific Gravity</b>		0.92	0.91	0.91	0.90	0.86	0.86
<b>Brookfield Viscosity</b> , (toluene solutions), cps at 77°F	25%w <sup>4</sup>	>50,000	50,000	200	1,980	8,700	12,800 <sup>5</sup>
	10%w <sup>4</sup>	—	280	10	35	140	1,805 <sup>5</sup>
<b>Melt Index</b> gms/10 min. (5kg)	200°C	<1	<1	65	3	8	4
	230°C	<1	<1	>100	13	—	—
<b>Oil Content</b> , %w		0	0	0	0	0	12
<b>Styrene/Rubber Ratio</b>		37/63	28/72	30/70	20/80	0/100	0/100
<b>Physical Form</b>		Powder	Powder	Dense Pellet	Dense Pellet	Bale	Bale
<b>Diblock</b> , %		100	100	70	<1	—	—
<b>Comments</b>		FDA	FDA	FDA	FDA	FDA	FDA

1. ASTM method D412 — tensile tester jaw separation speed 10 in./min.

2. Typical properties determined on film cast from toluene solution.

3. Typical values on polymer compression molded at 350°F.

4. Neat polymer concentration, in toluene.

5. Oil extended polymer.

Kraton Polymers

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# Kraton G - SEBS/SEPS Summary of properties.

These are typical values and should not be used to set specifications.

Kraton G Oiled Polymer Grades			
Property		G4609H (SEBS) Linear	G4610H (SEBS) Linear
Tensile Strength, psi <sup>1</sup>		—	—
300% Modulus, psi <sup>1</sup>		—	—
Elongation, % <sup>1</sup>		—	—
Hardness Shore A (10sec.) <sup>3</sup>		22	36
Specific Gravity		—	—
Brookfield Viscosity, (toluene solutions), cps at 77°F	25%w	11,000 <sup>4</sup>	>50,000 <sup>4</sup>
	10%w	50 <sup>4</sup>	240 <sup>4</sup>
Melt Index gms/10 min. (5kg)	200°C	<1	<1
	230°C	<1	<1
Oil Content, %w		47	31
Styrene/Rubber Ratio		33/67	33/67
Physical Form		Powder	Powder
Diblock, %		<1	<1
Comments		FDA G1651 with oil	FDA G1651 with oil

Kraton FG Polymer Grades		
	FG1901X (SEBS) Linear	FG1924X (SEBS) Linear
	5,000	3,400
	—	—
	500	750
	71	49
	0.91	0.89
	5,000	19,000
	110	270
	5	11
	22	40
	0	0
	30/70	13/87
	Dense Pellet	Dense Pellet
	—	—
	FDA 1.7% bound functionality	FDA 1.0% bound functionality

1. ASTM method D412 — tensile tester jaw separation speed 10 in./min.

2. Typical properties determined on film cast from toluene solution.

3. Typical values on polymer compression molded at 350°F.

4. Oil extended polymer.

'X' denotes development product.

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The actual manufacturing location is indicated by a suffix in the grade name, e.g. D-1101K.

An 'A' indicates Germany (Wesseling),

'E' France (Berre),

'J' Japan (Kashima),

'B' Brazil (Paulinia) and

'N' indicates the Netherlands (Pernis). 'P', 'K', 'H', 'M' indicates USA (Belpre).

# Kraton Compounds and Master Batches Summary of properties.

These are typical values and should not be used to set specifications. 'Ready to Use' compounds for injection molding and extrusion.

Kraton D Compound Grades <sup>1</sup>					
Property	Unit	D2104Z	D2109Z	D2122 <sup>2</sup>	D3158
<b>Hardness, ASTM D2240</b>					
Compression Molded <sup>4</sup>	Shore A	—	—	—	39
Injection Molded	Shore A	39	—	52	—
Extruded	Shore A	41	48	—	—
<b>Tensile Properties ASTM D412<sup>1</sup></b>					
Tensile Strength	psi	1,350	1,600 <sup>3</sup>	1,240	—
300% Modulus <sup>1</sup>	psi	250	300 <sup>3</sup>	—	—
Elongation <sup>1</sup>	%	1,750	1,200 <sup>3</sup>	1,130	—
<b>Tear Resistance, ASTM D-624, Die C</b>	pli	200	110	180	—
<b>Specific Gravity</b>		0.92	0.94	0.93	0.98
<b>Melt Index gms/10 min.</b>	200°C/5kg	22	15	21	—
<b>Physical Form</b>		Dense Pellet	Dense Pellet	Dense Pellet	Porous Pellet
<b>Standard Color</b>		Clear	White Natural	Natural	Black
<b>Ozone Resistance</b>	Stressed	Poor	Poor	Poor	—
	Unstressed	Fair	Fair	Fair	—
<b>Comments</b>		FDA	FDA	FDA	Asphalt Modifier

1. Values are typical of injection molded samples except where noted.

2. Film grade.

3. Tensile values are typical of extruded samples.

4. Typical values on polymer composition compression molded at 350°F for Kraton D.

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# Kraton Compounds and Master Batches Summary of properties.

These are typical values and should not be used to set specifications. 'Ready to Use' compounds for injection molding and extrusion.

Kraton G Compound Grades <sup>1</sup>							
Property	Unit	G2705	G2832 <sup>2</sup>	G7705	G7720	G7723X <sup>5</sup>	G7820
<b>Hardness, ASTM D2240</b>							
Injection Molded	Shore A	55	—	45	60	—	91
	Shore D	—	—	—	—	—	41
Extruded	Shore A	54	44	—	—	78 <sup>4</sup>	—
<b>Tensile Properties ASTM D412<sup>1</sup></b>							
Tensile Strength	psi	850	1,600 <sup>3</sup>	600	750	2,420 <sup>4</sup>	1,750
300% Modulus <sup>1</sup>	psi	400	200 <sup>3</sup>	300	350	1,750 <sup>4</sup>	900
Elongation <sup>1</sup>	%	700	620 <sup>3</sup>	700	300	400 <sup>4</sup>	650
<b>Tear Resistance, ASTM D-624, Die C</b>	pli	140	—	100	130	—	280
<b>Specific Gravity</b>		0.90	—	1.18	1.19	0.94	1.14
<b>Melt Index gms/10 min.</b>	200°C, 5kg	—	13	—	—	<1	—
<b>Physical Form</b>		Dense Pellet	Dense Pellet	Dense Pellet	Dense Pellet	Dense Pellet	Dense Pellet
<b>Standard Color</b>		Translucent	Translucent	Natural, Black	Natural, Black	Amber	Natural, Black
<b>Ozone Resistance</b>	Stressed	High	High	High	High	High	High
	Unstressed	High	High	High	High	High	High
<b>Comments</b>		FDA	FDA	—	—	—	—

1. Values are typical of injection molded samples except where noted.

'X' denotes development product.

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2. Film grade.

3. Tensile values are typical of extruded samples.

4. Typical values on polymer composition compression molded at 400°F for Kraton G.

5. 100 phr pf G1652 with 30 phr of high molecular weight PPO.

## End Use Requirements

If the finished article is intended for use in food contact and packaging applications, toys, or other human contact areas, manufacturers of the final product should observe all relevant regulations. Some of these regulations require tests to be carried out on the final product, e.g. migration. These are the responsibility of the final product manufacturer.

Information on the food packaging clearances of individual products is available from Kraton Polymers.

## Medical, Healthcare and Cosmetic Applications and Trademark Usage

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- a. Cosmetics (exclusive of packaging or delivery applications).
- b. Drugs and other Pharmaceuticals (exclusive of packaging or delivery applications).

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Read the Material Safety Data Sheet for Kraton Polymers' products carefully and thoroughly before beginning any work with such products. Additional information relating to the health, safety, storage, handling and processing of Kraton Polymers' products can be found in the Kraton Polymer HSE Fact Sheet (K0155), available from your local Kraton Polymers Sales Representative. Kraton Polymers also recommends that customers or users consult other sources of safety information, for example, the current edition of the "Code of Practice on the Toxicity and Safe Handling of Rubber Chemicals," British Rubber Manufacturers Association Limited ([www.brma.co.uk](http://www.brma.co.uk)).

Kraton Polymers products' and compounds can accumulate electrostatic charges when rubbed, chafed or abraded. Processing and storage equipment for use with Kraton Polymers' products should provide a means of dissipating any charges that may develop.

When processing Kraton Polymers' products, maintain a fire watch if the material reaches 225°C (437°F) for Kraton IR and Kraton D (polymers and compounds), and 280°C (536°F) for Kraton G (polymers and compounds). The temperatures listed above are indicated only for safety reasons (risk of fire and product degradation) and are not necessarily recommended for processing. Degradation of the polymer (polymer breakdown) will start at lower temperatures depending on the specific processing conditions. Therefore, operating below these temperatures does not guarantee the absence of product degradation.

Kraton Polymers' products (the neat resin or the base product) are high molecular weight polymers which by all accounts are non-toxic and biologically inactive.

## Warranty

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