

NOVAPOL® Film

Product Summary Sheet

polyethylene

| Grade | End-Use Application | Additive Package | Melt Index ⁽¹⁾ | Properties | | | Film Properties ⁽²⁾ | | Tear Strength | |
|----------------------------|---------------------------------------|--|---------------------------|--------------------|----------------------------|----------------------|--------------------------------|--|---------------|-------------|
| | | | | Density | Thickness | Dart Drop Impact | Low Friction Puncture | MD | TD | |
| | | | | D 1238 g/10 min | D 792 g/cm ³ | um (mil) | D 1709/A g | J/mm (in-lb/mil) | D 1922 g | D 1922 g |
| NOVAPOL® LLDPE | TD-9022-C | Industrial liners, heavy duty sheeting, heavy duty packaging | PS, AB | 0.8 | 0.916 | 25 (1.0) | 550 | 60 (13) | 450 | 600 |
| | TD-9022-D | Retail trash bags | PS, High S/AB | 0.8 | 0.916 | 25 (1.0) | 550 | 60 (13) | 450 | 600 |
| NOVAPOL Hexene LLDPE | TF-0338-E ⁽³⁾ | Diaper back sheet, blending | High temp AO | 3.5 | 0.938 | 25 (1.0) | — | 13 (3) ⁽³⁾ | 35 | 200 |
| | TF-Y534-IP | Low haze overwrap | Low S/AB, PPA | 0.75 | 0.934 | 25 (1.0) | 72 | 76 (17) | 50 | 540 |
| | TF-Y822-BP | Industrial packaging, high-strength liners | Med S/AB, PPA | 0.8 | 0.921 | 38 (1.5) | 240 | 100 (22) | 500 | 870 |
| | TF-Y822-CP | Heavy duty sacks, high strength packaging | AB, PPA | 0.8 | 0.921 | 38 (1.5) | 240 | 100 (22) | 500 | 870 |
| | TF-Y826-CP | Industrial bags, industrial packaging | AB, PPA | 0.8 | 0.926 | 38 (1.5) | 210 | 50 (12) | 240 | 825 |
| | TF-Y826-D | Premium trash bags, bags-on-roll | High S/AB | 0.8 | 0.926 | 38 (1.5) | 210 | 50 (12) | 240 | 825 |
| | TF-0119-D | Thin films, premium trash bags, ice bags | High S/AB | 1.0 | 0.918 | 38 (1.5) | 270 | 65 (15) | 450 | 975 |
| | TF-0119-F TF-0219-E ⁽³⁾ | Stretch wrap, blend resin Cast stretch wrap | PS High temp AO | 1.0 2.0 | 0.918 0.918 | 38 (1.5) 20 (0.8) | 270 160 | 50 (11) ⁽⁴⁾ 70 (16) ⁽⁴⁾ | 450 320 | 975 600 |
| NOVAPOL Butene LLDPE | PF-0218-D | Trash bags, bags-on-roll, garment film | High S/AB | 2.0 | 0.918 | 38 (1.5) | 110 | 45 (10) | 135 | 400 |
| | PF-0218-F | Cast films, blending | PS | 2.0 | 0.918 | 38 (1.5) | 110 | 60 (14) | 135 | 400 |
| | PF-Y821-B | General purpose packaging, liners | Med S/AB | 0.8 | 0.921 | 38 (1.5) | 135 | 45 (11) | 130 | 520 |
| | PF-Y821-BP | General purpose packaging, bags requiring moderate clarity, bread bags | PS, Med S/AB, PPA | 0.8 | 0.921 | 38 (1.5) | 140 | 75 (18) | 195 | 390 |
| | PF-Y821-CP | Industrial packaging, heavy duty sacks | AB, PPA | 0.8 | 0.921 | 38 (1.5) | 140 | 75 (18) | 195 | 390 |

(1) Condition 190/2.16.

(2) Film properties are typical of blown film extruded at a blow up ratio of 2.5:1, but are dependent upon operating conditions.

(3) Film properties are typical of cast film.

(4) NOVA Chemicals test method.

Note: Resins with a process aid package are processed with a narrow die gap (35 - 50 mils).

Additive Package Coding

| | |
|------------|----------------------------|
| AB | Antiblock |
| B | Base Product |
| S | Slip |
| PS | Process Stabilizer |
| PPA | Polymer Process Aid |

| Grade | | Tensile Strength | | Yield Strength | | Elongation | | 1% Secant Modulus | | Haze | Gloss @ 45° D 2457 | Coefficient of Friction D 1894 |
|---------------------------------|--------------------------|--------------------|-------------------|-------------------|-------------------|------------|------------|--------------------|--------------------|------|--------------------------|--------------------------------------|
| | | MD | TD | MD | TD | MD | TD | MD | TD | | | |
| | | D 882 MPa (psi) | D882 MPa (psi) | D882 MPa (psi) | D882 MPa (psi) | D882 % | D 882 % | D 882 MPa (psi) | D 882 MPa (psi) | | | |
| NOVAPOL Superhexene LLDPE | TD-9022-C | 42 (6100) | 35 (5100) | 10 (1450) | 11 (1595) | 550 | 700 | 160 (23200) | 190 (27550) | — | — | >0.4 |
| | TD-9022-D | 42 (6100) | 35 (5100) | 10 (1450) | 11 (1595) | 550 | 700 | 160 (23200) | 190 (27600) | — | — | <0.2 |
| NOVAPOL Hexene LLDPE | TF-0338-E ⁽³⁾ | 41 (6000) | 32 (4700) | 15 (2200) | 16 (2350) | 800 | 1070 | 320 (47000) | 380 (55000) | 4 | 87 | >0.8 |
| | TF-Y534-IP | 44 (6600) | 32 (4600) | 15 (2200) | 17 (2500) | 520 | 760 | 350 (50700) | 410 (59500) | 9 | 63 | 0.38 |
| | TF-Y822-BP | 32 (4650) | 28 (4050) | 10 (1450) | 10 (1450) | 650 | 850 | 180 (26000) | 200 (29000) | 10 | 60 | <0.25 |
| | TF-Y822-CP | 32 (4650) | 28 (4050) | 10 (1450) | 10 (1450) | 650 | 850 | 180 (26000) | 200 (29000) | 10 | 60 | >0.5 |
| | TF-Y826-CP | 44 (6400) | 32 (4600) | 13 (1900) | 14 (2000) | 600 | 700 | 210 (30000) | 250 (36000) | 18 | 39 | >0.4 |
| | TF-Y826-D | 44 (6400) | 32 (4600) | 13 (1900) | 14 (2000) | 600 | 700 | 210 (30000) | 250 (36000) | 18 | 37 | <0.2 |
| | TF-0119-D | 37 (5300) | 32 (4500) | 10 (1450) | 11 (1600) | 600 | 700 | 170 (24600) | 190 (27550) | 19 | 37 | <0.2 |
| TF-0119-F | TF-0219-E ⁽³⁾ | 37 (5300) | 32 (4500) | 10 (1450) | 11 (1600) | 600 | 700 | 170 (24600) | 190 (27550) | 10 | 50 | >0.6 |
| | TF-0219-E ⁽³⁾ | 45 (6530) | 30 (4350) | 8 (1200) | 8 (1200) | 550 | 840 | 140 (20300) | 150 (21760) | 2 | 90 | — |
| NOVAPOL Butene LLDPE | PF-0218-D | 30 (4300) | 25 (3600) | 10 (1400) | 9 (1300) | 690 | 740 | 180 (26000) | 200 (28000) | 20 | 35 | <0.2 |
| | PF-0218-F | 30 (4300) | 25 (3600) | 10 (1400) | 9 (1300) | 690 | 740 | 180 (26000) | 200 (28000) | 14 | 50 | >0.6 |
| | PF-Y821-B | 38 (5400) | 27 (3800) | 11 (1600) | 11 (1600) | 550 | 690 | 200 (28000) | 230 (33000) | 12 | 50 | <0.25 |
| | PF-Y821-BP | 30 (4300) | 25 (3600) | 10 (1400) | 10 (1400) | 660 | 730 | 190 (27000) | 230 (33000) | 11 | 57 | <0.25 |
| | PF-Y821-CP | 30 (4300) | 25 (3625) | 10 (1400) | 10 (1400) | 660 | 730 | 190 (27000) | 230 (33000) | 11 | 57 | >0.5 |

| Grade | End-Use Application | Additive Package | Melt Index ⁽¹⁾ | Properties | | Film Properties ⁽²⁾ | | Tear Strength | | |
|-----------------------------|---------------------|--|---------------------------|--------------------|----------------------------|--------------------------------|-----------------------|---------------------|-------------|-------------|
| | | | | Density | Thickness | Dart Drop Impact | Low Friction Puncture | MD | TD | |
| | | | | D 1238 g/10 min | D 792 g/cm ³ | um (mil) | D 1709/A g | J/mm (in-lb/mil) | D 1922 g | D 1922 g |
| NOVAPOL® Butene LLDPE | PF-Y821-D | Bags-on-roll, produce bags, garment film, trash bags | High S/AB | 0.8 | 0.921 | 38 (1.5) | 130 | 45 (11) | 130 | 520 |
| | PF-0118-B | Trash bags, liners, general packaging | Med S/AB | 1.0 | 0.918 | 38 (1.5) | 140 | 50 (12) | 150 | 450 |
| | PF-0118-C | Industrial liners, heavy duty bags | AB | 1.0 | 0.918 | 38 (1.5) | 140 | 50 (12) | 150 | 450 |
| | PF-0118-D | Trash bags, garment film, bags-on-roll | High S/AB | 1.0 | 0.918 | 38 (1.5) | 140 | 50 (12) | 150 | 450 |
| | PF-0118-F | Stretch wrap, blend resin, industrial packaging | PS | 1.0 | 0.918 | 38 (1.5) | 140 | 65 (15) | 150 | 450 |
| NOVAPOL LDPE | LF-Y320-C | Industrial packaging | AB | 0.25 | 0.921 | 38 (1.5) | 240 | 10 (2.5) | 290 | 120 |
| | LF-Y320-D | Industrial packaging | High S/AB | 0.25 | 0.922 | 38 (1.5) | 240 | 10 (2.5) | 292 | 120 |
| | LF-Y819-A | Industrial packaging, shrink film, blends with LLDPE, small diameter pipe and tubing | B | 0.75 | 0.919 | 38 (1.5) | 110 | 45 (10) | 280 | 130 |
| | LF-Y819-C | Industrial packaging, liners, shrink film, blends with LLDPE | AB | 0.75 | 0.921 | 38 (1.5) | 110 | 30 (7) | 280 | 130 |
| | LF-Y819-D | Industrial packaging, liners, shrink film, blends with LLDPE | High S/AB | 0.75 | 0.921 | 38 (1.5) | 110 | 15 (3) | 280 | 130 |
| | LF-0219-A | Industrial packaging, liners, blends with LLDPE, foam articles | B | 2.3 | 0.918 | 38 (1.5) | 90 | 45 (10) | 220 | 150 |
| | LF-0219-D | Liners, industrial packaging, blends with LLDPE | High S/AB | 2.3 | 0.919 | 38 (1.5) | 90 | 15 (3) | 220 | 150 |
| | LF-0323-A | Food wrap, consumer packaging, liners, blends with LLDPE | B | 3.2 | 0.922 | 38 (1.5) | 90 | 30 (7) | 230 | 230 |
| | LF-0323-B | Bakery bags, sandwich bags, zipper lock bags, cast film | S/AB | 3.2 | 0.923 | 38 (1.5) | 90 | 15 (3) | 230 | 230 |
| | LF-0718-A | Improves gloss, reduces haze, improves melt strength and output in blends with LLDPE | B | 7.0 | 0.917 | -- | -- | -- | -- | -- |

(1) Condition 190/2.16

(2) Film properties are typical of blown film extruded at a blow up ratio of 2.5:1, but are dependent upon operating conditions.

(3) Film properties are typical of cast film.

(4) NOVA Chemicals test method.

Note: Resins with a process aid package are processed with a narrow die gap (35 – 50 mils).

Additive Package Coding

| | |
|------------|----------------------------|
| AB | Antiblock |
| B | Base Product |
| S | Slip |
| PS | Process Stabilizer |
| PPA | Polymer Process Aid |

| Grade | Tensile Strength | | Yield Strength | | Elongation | | 1% Secant Modulus | | Haze | Gloss @ 45° D 2457 | Coefficient of Friction D 1894 | |
|-----------------------------|--------------------|-------------------|-------------------|-------------------|------------|------------|--------------------|--------------------|-------------|--------------------------|--------------------------------------|-------|
| | MD | TD | MD | TD | MD | TD | MD | TD | | | | |
| | D 882 MPa (psi) | D882 MPa (psi) | D882 MPa (psi) | D882 MPa (pai) | D882 % | D 882 % | D 882 MPa (psi) | D 882 MPa (psi) | | | | |
| NOVAPOL® Butene LLDPE | PF-Y821-D | 38 (5400) | 27 (3800) | 11 (1600) | 11 (1600) | 550 | 690 | 200 (28000) | 230 (33000) | 16 | 45 | <0.2 |
| | PF-0118-B | 34 (4800) | 26 (3700) | 11 (1600) | 10 (1400) | 600 | 760 | 180 (26000) | 200 (28000) | 15 | 45 | <0.2 |
| | PF-0118-C | 34 (4800) | 26 (3700) | 11 (1600) | 10 (1400) | 600 | 760 | 180 (26000) | 200 (28000) | 15 | 45 | >0.4 |
| | PF-0118-D | 34 (4800) | 26 (3700) | 11 (1600) | 10 (1400) | 600 | 760 | 180 (26000) | 200 (28000) | 18 | 40 | <0.2 |
| | PF-0118-F | 34 (4800) | 26 (3700) | 11 (1600) | 10 (1400) | 600 | 760 | 180 (26000) | 200 (28000) | 12 | 55 | >0.6 |
| NOVAPOL LDPE | LF-Y320-C | 29 (4200) | 23 (3350) | 15 (2200) | 10 (1450) | 110 | 450 | 190 (28000) | 230 (33000) | 30 | 20 | >0.45 |
| | LF-Y320-D | 29 (4200) | 23 (3350) | 15 (2200) | 10 (1450) | 110 | 450 | 190 (28000) | 230 (33000) | 30 | 20 | <0.20 |
| | LF-Y819-A | 20 (2900) | 18 (2600) | 11 (1600) | 10 (1450) | 400 | 600 | 180 (26000) | 200 (29000) | 15 | 35 | >0.6 |
| | LF-Y819-C | 20 (2900) | 18 (2600) | 11 (1600) | 10 (1450) | 400 | 600 | 180 (26000) | 200 (29000) | 17 | 35 | >0.4 |
| | LF-Y819-D | 20 (2900) | 18 (2600) | 11 (1600) | 10 (1450) | 400 | 600 | 180 (26000) | 200 (29000) | 17 | 35 | <0.2 |
| | LF-0219-A | 18 (2600) | 16 (2300) | 10 (1450) | 9 (1300) | 350 | 550 | 150 (22000) | 175 (25500) | 12 | 40 | >0.6 |
| | LF-0219-D | 18 (2600) | 16 (2300) | 10 (1450) | 9 (1300) | 350 | 550 | 150 (22000) | 175 (25500) | 14 | 40 | <0.2 |
| | LF-0323-A | 20 (2900) | 18 (2600) | 10 (1450) | 10 (1450) | 400 | 550 | 165 (24000) | 180 (26000) | 6 | 70 | >0.5 |
| | LF-0323-B | 20 (2900) | 18 (2600) | 10 (1450) | 10 (1450) | 400 | 550 | 165 (24000) | 180 (26000) | 8 | 70 | <0.3 |
| | LF-0718-A | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

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