

## NYLATRON®

**Material Notes:** Nylatron GS Nylon is a nylon and molybdenum disulphide (MoS<sub>2</sub>) composition designed to improve the mechanical, thermal and bearing properties of type 6/6 nylon while maintaining its basic electrical and chemical characteristics. Through compounding, finely divided particles impart extra lubricity to this nylon, permitting Nylatron GS parts to operate with little or no lubrication. The added lubricity also contributes dramatically to component service life, making Nylatron GS a very cost-efficient choice. Nylatron GS nylon offers greater wear resistance, lower surface friction, higher strength and greater rigidity than unfilled 6/6 with improved dimensional stability.

MECHANICAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Specific Gravity	1.16	ASTM D792	1.16
Tensile Strength, psi	12500	ASTM D638	86 MPa
Tensile Modulus, psi	480000	ASTM D638	3,310 MPa
Elongation, %	25	ASTM D638	25 %
Flexural Strength, psi	17000	ASTM D790	117 MPa
Flexural Modulus, psi	460000	ASTM D790	3,172 MPa
Shear Strength, psi	10500	ASTM D732	72 MPa
Compressive Strength, psi	16000	ASTM D695, 10% Def.	110 MPa
Compressive Modulus, psi	420000	ASTM D695	2,896 MPa
Hardness, Rockwell M	85	ASTM D785	85
Hardness, Rockwell R	115	ASTM D785	115
Hardness, Durometer, Shore D Scale	85	ASTM D2240	85
Izod Impact (Notched), ft-lb/in	0.5	ASTM D256 Type A	27 J/m
Coefficient of Friction, Dynamic	0.2	Dry vs. Steel, PTM55007	0.2
Limiting PV, psi-fpm	3000	PTM55007	0.11 MPa-m/sec
k (wear) factor, $10^{-10}$ in <sup>3</sup> -min/lb-ft-hr	90	PTM55007	$90 \cdot 10^{-10}$ in <sup>3</sup> -min/lb-ft-hr

THERMAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Coefficient of Thermal Expansion, 10E-4/°F	0.4	ASTM E831 (TMA)	$0.72 \cdot 10^{-4}/K$
Deflection Temperature 264 psi, °F	200	ASTM D648	93 °C
Melting Point (Crystalline) Peak, °F	500	ASTM D3418	260 °C
Continuous Service in Air (Max), °F	220	Without Load	104 °C
Thermal Conductivity, BTU-in/hr-ft <sup>2</sup> -°F	1.7		0.24 W/m-K

ELECTRICAL PROPERTIES	VALUES	COMMENTS	METRIC VALUES
Dielectric Strength, Short Term, Volts/mil	350	ASTM D149(2)	14 kV/mm

Surface Resistance, Ohm/Square	1E+13	EOS/ESD S11.11	1E+13 Ohm/ Square
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CHEMICAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Water Absorption Immersion, 24 hr., %	0.3	ASTM D570	0.3 %
Water Absorption Immersion Sat, %	7	ASTM D570	7 %
Acids, Weak (acetic, dilute HCl)	2	Limited Service	2
Acids, Strong (conc. HCl or sulfuric)	1	Unacceptable	1
Alkalies, Weak (dilute NaOH)	2	Limited Service	2
Alkalies, Strong (conc. NaOH)	1	Unacceptable	1
Hydrocarbons, Aromatic (toluene)	3	Acceptable Service	3
Hydrocarbons, Aliphatic (gasoline)	3	Acceptable Service	3
Ketones, Esters (acetone)	3	Acceptable Service	3
Ethers (diethyl ether, THF)	3	Acceptable Service	3
Chlorinated Solvents (methylene chloride)	2	Limited Service	2
Alcohols (methanol, anti-freeze)	2	Limited Service	2
Inorganic Salt Solutions (NaCl, KCl)	3	Acceptable Service	3
Continuous Sunlight	2	Limited Service	2
Steam	1	Unacceptable	1

COMPLIANCE	ENGLISH VALUES	COMMENTS	METRIC VALUES
Flammability, UL94 (5=V-0; 4=V-1; 3=V-2; 1=HB)	3 (V-2)	UL94	3
FDA (1=Yes)	0	Not Compliant	0
USDA (1=Yes)	0	Not Compliant	0
NSF (1=Yes)	0	Not Compliant	0
3A-Dairy (1=Yes)	0	Not Compliant	0
Canada AG (1=Yes)	0	Not Compliant	0
USP Class VI (1=Yes)	0	Not Compliant	0

**Material Notes:** Nylatron GSM Blue nylon is the first cast nylon to combine both molybdenum disulfide and oil for the load capability of Nylatron GSM nylon, plus improved frictional characteristics. It excels in higher pressures, and at low speeds-up to 40 fpm. It offer 20% lower coefficient of friction, 50% greater limiting PV, and a lower "k" factor than Nylatron GSM, and the lowest "slip-stick" of any nylon product. It is ideal for slide pads, thrust washers and trunion bearings. Nylatron GSM blue should be considered for any oil-filled nylon application. It is dark blue in color.

MECHANICAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Specific Gravity	1.15	ASTM D792	1.15
Tensile Strength, psi	10000	ASTM D638	69 MPa
Tensile Modulus, psi	500000	ASTM D638	3,448 MPa
Elongation, %	30	ASTM D638	30 %
Flexural Strength, psi	15000	ASTM D790	103 MPa
Flexural Modulus, psi	500000	ASTM D790	3,448 MPa
Compressive Strength, psi	13000	ASTM D695, 10% Def.	90 MPa
Compressive Modulus, psi	425000	ASTM D695	2,930 MPa
Hardness, Rockwell M	80	ASTM D785	80
Hardness, Rockwell R	117	ASTM D785	117
Izod Impact (Notched), ft-lb/in	0.9	ASTM D256 Type A	48 J/m
Coefficient of Friction, Dynamic	0.18	Dry vs. Steel, PTM55007	0.18
Limiting PV, psi-fpm	5500	PTM55007	0.19 MPa-m/sec
k (wear) factor, $10^{-10}$ in <sup>3</sup> -min/lb-ft-hr	65	PTM55007	$65 \cdot 10^{-10}$ in <sup>3</sup> -min/lb-ft-hr
THERMAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Coefficient of Thermal Expansion, 10E-4/°F	0.45	ASTM E831 (TMA)	$0.81 \cdot 10^{-4}$ /K
Deflection Temperature 264 psi, °F	200	ASTM D648	93 °C
Melting Point (Crystalline) Peak, °F	420	ASTM D3418	216 °C
Continuous Service in Air (Max), °F	200	Without Load	93 °C
ELECTRICAL PROPERTIES	VALUES	COMMENTS	METRIC VALUES
Surface Resistance, Ohm/Square	1E+13	EOS/ESD S11.11	1E+13 Ohm/Square
CHEMICAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Water Absorption Immersion, 24 hr., %	0.22	ASTM D570	0.22 %
Water Absorption Immersion Sat, %	6	ASTM D570	6 %

Acids, Weak (acetic, dilute HCl)	2	Limited Service	2
Acids, Strong (conc. HCl or sulfuric)	1	Unacceptable	1
Alkalies, Weak (dilute NaOH)	2	Limited Service	2
Alkalies, Strong (conc. NaOH)	1	Unacceptable	1
Hydrocarbons, Aromatic (toluene)	3	Acceptable Service	3
Hydrocarbons, Aliphatic (gasoline)	3	Acceptable Service	3
Ketones, Esters (acetone)	3	Acceptable Service	3
Ethers (diethyl ether, THF)	3	Acceptable Service	3
Chlorinated Solvents (methylene chloride)	2	Limited Service	2
Alcohols (methanol, anti-freeze)	2	Limited Service	2
Inorganic Salt Solutions (NaCl, KCl)	3	Acceptable Service	3
Continuous Sunlight	2	Limited Service	2
Steam	1	Unacceptable	1

COMPLIANCE	ENGLISH VALUES	COMMENTS	METRIC VALUES
Flammability, UL94 (5=V-0; 4=V-1; 3=V-2; 1=HB)	1 (HB)	UL94	1
FDA (1=Yes)	0	Not Compliant	0
USDA (1=Yes)	0	Not Compliant	0
NSF (1=Yes)	0	Not Compliant	0
3A-Dairy (1=Yes)	0	Not Compliant	0
Canada AG (1=Yes)	0	Not Compliant	0
USP Class VI (1=Yes)	0	Not Compliant	0

**Material Notes:** Nylatron GSM cast nylon contains finely divided particles of molybdenum disulfide to enhance its load bearing capabilities while maintaining the impact resistance inherent to nylon. It is the most commonly used grade for gears, sheaves, sprockets and custom parts. It is gray-black in color.

MECHANICAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Specific Gravity	1.16	ASTM D792	1.16
Tensile Strength, psi	11000	ASTM D638	76 MPa
Tensile Modulus, psi	400000	ASTM D638	2,758 MPa
Elongation, %	30	ASTM D638	30 %
Flexural Strength, psi	16000	ASTM D790	110 MPa
Flexural Modulus, psi	500000	ASTM D790	3,448 MPa
Shear Strength, psi	10500	ASTM D732	72 MPa
Compressive Strength, psi	14000	ASTM D695, 10% Def.	97 MPa
Compressive Modulus, psi	400000	ASTM D695	2,758 MPa
Hardness, Rockwell M	80	ASTM D785	80
Hardness, Rockwell R	110	ASTM D785	110
Hardness, Durometer, Shore D Scale	85	ASTM D2240	85
Izod Impact (Notched), ft-lb/in	0.5	ASTM D256 Type A	27 J/m
Coefficient of Friction, Dynamic	0.2	Dry vs. Steel, PTM55007	0.2
Limiting PV, psi-fpm	3000	PTM55007	0.11 MPa-m/sec
k (wear) factor, $10^{-10}$ in <sup>3</sup> -min/lb-ft-hr	90	PTM55007	$90 \cdot 10^{-10}$ in <sup>3</sup> -min/lb-ft-hr
THERMAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Coefficient of Thermal Expansion, 10E-4/°F	0.45	ASTM E831 (TMA)	$0.81 \cdot 10^{-4}$ /K
Deflection Temperature 264 psi, °F	200	ASTM D648	93 °C
Melting Point (Crystalline) Peak, °F	420	ASTM D3418	216 °C
Continuous Service in Air (Max), °F	200	Without Load	93 °C
ELECTRICAL PROPERTIES	VALUES	COMMENTS	METRIC VALUES
Dielectric Strength, Short Term, Volts/mil	400	ASTM D149(2)	16 kV/mm
Surface Resistance, Ohm/Square	1E+13	EOS/ESD S11.11	1E+13 Ohm/Square
Dielectric Constant, 1 MHz	3.7	ASTM D150(2)	3.7
CHEMICAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES

Water Absorption Immersion, 24 hr., %	0.3	ASTM D570	0.3 %
Water Absorption Immersion Sat, %	7	ASTM D570	7 %
Acids, Weak (acetic, dilute HCl)	2	Limited Service	2
Acids, Strong (conc. HCl or sulfuric)	1	Unacceptable	1
Alkalies, Weak (dilute NaOH)	2	Limited Service	2
Alkalies, Strong (conc. NaOH)	1	Unacceptable	1
Hydrocarbons, Aromatic (toluene)	3	Acceptable Service	3
Hydrocarbons, Aliphatic (gasoline)	3	Acceptable Service	3
Ketones, Esters (acetone)	3	Acceptable Service	3
Ethers (diethyl ether, THF)	3	Acceptable Service	3
Chlorinated Solvents (methylene chloride)	2	Limited Service	2
Alcohols (methanol, anti-freeze)	2	Limited Service	2
Inorganic Salt Solutions (NaCl, KCl)	3	Acceptable Service	3
Continuous Sunlight	2	Limited Service	2
Steam	1	Unacceptable	1

COMPLIANCE	ENGLISH VALUES	COMMENTS	METRIC VALUES
Flammability, UL94 (5=V-0; 4=V-1; 3=V-2; 1=HB)	1 (HB)	UL94	1
FDA (1=Yes)	0	Not Compliant	0
USDA (1=Yes)	0	Not Compliant	0
NSF (1=Yes)	0	Not Compliant	0
3A-Dairy (1=Yes)	0	Not Compliant	0
Canada AG (1=Yes)	0	Not Compliant	0
USP Class VI (1=Yes)	0	Not Compliant	0

**Material Notes:** Nylatron NSM is the premium bearing and wear nylon product available today. Solid lubricant additives impart self-lubricating, high pressure/velocity and superior wear resistance characteristics. This wear resistance is delivered without either start-up or running lubrication making it ideal for bearings, gears and wear pads. It is a proprietary type 6 nylon formulation produced using Quadrant EPP's Monocast process. Nylatron NSM was developed specifically for demanding applications where larger size parts are required. In wear applications, Nylatron NSM lasts up to 10 times longer than standard Type 6 nylon.

MECHANICAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Specific Gravity	1.15	ASTM D792	1.15
Tensile Strength, psi	11000	ASTM D638	76 MPa
Tensile Modulus, psi	410000	ASTM D638	2,827 MPa
Elongation, %	20	ASTM D638	20 %
Flexural Strength, psi	16000	ASTM D790	110 MPa
Flexural Modulus, psi	475000	ASTM D790	3,275 MPa
Shear Strength, psi	10000	ASTM D732	69 MPa
Compressive Strength, psi	14000	ASTM D695, 10% Def.	97 MPa
Compressive Modulus, psi	400000	ASTM D695	2,758 MPa
Hardness, Rockwell M	80	ASTM D785	80
Hardness, Rockwell R	110	ASTM D785	110
Hardness, Durometer, Shore D Scale	85	ASTM D2240	85
Izod Impact (Notched), ft-lb/in	0.5	ASTM D256 Type A	27 J/m
Coefficient of Friction, Dynamic	0.18	Dry vs. Steel, PTM55007	0.18
Limiting PV, psi-fpm	15000	PTM55007	0.53 MPa-m/sec
k (wear) factor, $10^{-10}$ in <sup>3</sup> -min/lb-ft-hr	9	PTM55007	$9 \cdot 10^{-10}$ in <sup>3</sup> -min/lb-ft-hr

THERMAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Coefficient of Thermal Expansion, 10E-4/°F	0.45	ASTM E831 (TMA)	$0.81 \cdot 10^{-4}/K$
Deflection Temperature 264 psi, °F	200	ASTM D648	93 °C
Melting Point (Crystalline) Peak, °F	420	ASTM D3418	216 °C
Continuous Service in Air (Max), °F	200	Without Load	93 °C

ELECTRICAL PROPERTIES	VALUES	COMMENTS	METRIC VALUES
Dielectric Strength, Short Term, Volts/mil	400	ASTM D149(2)	16 kV/mm
Surface Resistance, Ohm/Square	1E+13	EOS/ESD S11.11	1E+13 Ohm/Square

CHEMICAL PROPERTIES	ENGLISH VALUES	COMMENTS	METRIC VALUES
Water Absorption Immersion, 24 hr., %	0.25	ASTM D570	0.25 %
Water Absorption Immersion Sat, %	7	ASTM D570	7 %
Acids, Weak (acetic, dilute HCl)	2	Limited Service	2
Acids, Strong (conc. HCl or sulfuric)	1	Unacceptable	1
Alkalies, Weak (dilute NaOH)	2	Limited Service	2
Alkalies, Strong (conc. NaOH)	1	Unacceptable	1
Hydrocarbons, Aromatic (toluene)	3	Acceptable Service	3
Hydrocarbons, Aliphatic (gasoline)	3	Acceptable Service	3
Ketones, Esters (acetone)	3	Acceptable Service	3
Ethers (diethyl ether, THF)	3	Acceptable Service	3
Chlorinated Solvents (methylene chloride)	2	Limited Service	2
Alcohols (methanol, anti-freeze)	2	Limited Service	2
Inorganic Salt Solutions (NaCl, KCl)	3	Acceptable Service	3
Continuous Sunlight	2	Limited Service	2
Steam	1	Unacceptable	1

COMPLIANCE	ENGLISH VALUES	COMMENTS	METRIC VALUES
Flammability, UL94 (5=V-0; 4=V-1; 3=V-2; 1=HB)	1 (HB)	UL94	1
FDA (1=Yes)	0	Not Compliant	0
USDA (1=Yes)	0	Not Compliant	0
NSF (1=Yes)	0	Not Compliant	0
3A-Dairy (1=Yes)	0	Not Compliant	0
Canada AG (1=Yes)	0	Not Compliant	0
USP Class VI (1=Yes)	0	Not Compliant	0