MILLESTERS
PRODUCT INFORMATION

POLYURETHANE CORPORATION OF AMERICA
POLYURETHANE SPECIALTIES COMPANY, INC.

624 Schuyler Avenue
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www.polyurethanespecialties.com

PSC'S OBJECTIVE

From the beginning Polyurethane Specialties had one major objective, and that has been to help you make better polyurethane products by marketing the finest specialty polyesters in the industry. We have the unique ability to produce specialty polyesters with the care and attention normally associated with custom manufacturing while remaining competitively priced by purchasing raw material and manufacturing in substantial volume.

WE HAVE YOUR NEEDS COVERED

We have formulated both standard and specialized polyesters to meet exact industry needs and support these products with a technical staff prepared to assist you in every phase of polyurethane manufacturing.

MILLESTER POLYESTERS

The data sheets in this booklet contain detailed descriptions of all the hydroxyl-terminated polyesters currently marketed under the Millester trademark. To assist you in locating these data sheets for the polyesters you are seeking, we note in the table of contents the chemical description of each Millester, the assigned class number and the page number for each sheet.

The utility of the Millester polyesters in elastomeric and rigid applications has the acceptance of each segment of industry, which includes coated flexible and rigid substrates, adhesives, potting compounds, sealants, caulks and foams. Properties of the ultimate polyurethane may be modified by the choices of the chemical composition and molecular weight. Specific questions about Millester polyesters and urethanes made from them should be directed to our technical staff.

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MILLESTER 1

CHARACTERISTICS

MILLESTER 1 difunctional polyesters should be considered for the preparation of polyurethanes in those applications in which the requirements include:

– A liquid polyester for ease of handling

– Moderately high tensile strength, resistance to tear, good low temperature properties and resiliency in the finished polyurethane.

CHEMICAL STRUCTURE: Ethylene glycol/1,4 butanediol adipate

USES:

– High performance shoe sole applications

– One shot castable elastomer systems

– The preparation of flexible coatings and adhesives

– Two-component polyurethane systems

– Polyurethane prepolymers

TYPICAL PROPERTIES	1-55	1-98	1-135
Hydroxyl Number	52-58	88-108	125-145
Molecular Weight, Avg.	2,040	1,145	830
Acid Number	<1.0	<1.0	<1.0
Moisture, Percentage (as shipped)	<0.1	<0.1	<0.1
Color, Gardner	<2	<2	<2
Form @ 25˚ C	Liquid	Liquid	Liquid
Viscosity, Brookfield, cps @ 25˚ C	9,900	2,250	1,400
Viscosity, Brookfield, cps @ 40˚ C	3,800	1,250	650
Viscosity, Brookfield, cps @ 60˚ C	1,300	475	270
Pounds/Gallons @ 25˚ C	9.6	9.6	9.6

SHIPPING AND HANDLING

MILLESTER 1 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 11

CHARACTERISTICS

MILLESTER 11 difunctional polyesters should be considered for the preparation of polyurethanes in those applications in which the requirements include:

– A liquid polyester for ease of handling.

– Moderately high tensile strength, resistance to tear, good low temperature properties and resiliency in the finished polyurethane.

CHEMICAL STRUCTURE: Ethylene glycol/1,4 butanediol adipate

USES:

– High performance shoe sole applications

– One shot castable elastomer systems

– The preparation of flexible coatings and adhesives

– Two-component polyurethane systems

– Polyurethane prepolymers

TYPICAL PROPERTIES	11-55
Hydroxyl Number	52-58
Molecular Weight, Avg.	2,040
Acid Number	<1.0
Moisture, Percentage (as shipped)	<0.1
Color, Gardner	<2
Form @ 25˚ C	Liquid
Viscosity, Brookfield, cps @ 25˚ C	9,900
Viscosity, Brookfield, cps @ 40˚ C	3,800
Viscosity, Brookfield, cps @ 60˚ C	1,300
Pounds/Gallons @ 25˚ C	9.6

SHIPPING AND HANDLING

MILLESTER 11 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 111-55D

CHARACTERISTICS

MILLESTER 111-55D difunctional polyesters should be considered for the preparation of polyurethanes in those applications in which the requirements include:

– A low melting point polyester for ease of handling.

– Moderately high tensile strength, resistance to tear, good low temperature properties and resiliency in the finished polyurethane.

CHEMICAL STRUCTURE: Ethylene glycol/1,4 butanediol adipate

USES:

– High performance shoe sole applications

– One shot castable elastomer systems

– The preparation of flexible coatings and adhesives

– Two-component polyurethane systems

– Polyurethane prepolymers

TYPICAL PROPERTIES	111-55D
Hydroxyl Number	53-59
Molecular Weight, Avg.	2,040
Acid Number	0.6
Moisture, Percentage (as shipped)	0.05
Color, APHA	<150
Form @ 25˚ C	Solid
Liquid @ C	35
Viscosity, Brookfield, cps @ 40˚ C	3,800
Viscosity, Brookfield, cps @ 60˚ C	1,300

SHIPPING AND HANDLING

MILLESTER 111-55D polyesters are supplied in 55 gallon non-returnable drums or in bulk. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 2

CHARACTERISTICS

MILLESTER 2 difunctional polyesters should be selected as raw materials for the preparation of polyurethanes when final polymer properties are required, such as:

– High tensile and tear strength, hardness and resiliency.

– Resistance to abrasion and solvents.

CHEMICAL STRUCTURE: Ethylene glycol adipate

USES:

MILLESTER 2 polyesters are recommended in particular for the manufacture of polyurethane:

– Fabric coatings

– Flexible adhesives

– Castable elastomers

– Thermoplastics

– Polyurethane prepolymers

TYPICAL PROPERTIES	2-37	2-55	2-75	2-90	2-110	2-135
Hydroxyl Number	34-40	52-58	70-80	83-97	100-120	125-145
Molecular Weight, Avg.	3,030	2,040	1,495	1,245	1,020	830
Acid Number	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Moisture, Percentage (as shipped)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Color, Gardner	<1	<1	<2	<1	<1	<1
Form @ 25˚ C	Solid	Solid	Solid	Solid	Solid	Solid
Liquid @ ˚C	65	65	60	60	60	60
Viscosity, Brookfield, cps @ 60˚ C	1,700	1,200	750	585	400	260

SHIPPING AND HANDLING

MILLESTER 2 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 2D

CHARACTERISTICS

MILLESTER 2D polyesters are a special low reactivity grade of difunctional polyesters and should be selected as raw materials for the preparation of polyurethanes when final polymer properties are required, such as:

– High tensile and tear strength, hardness and resiliency.

– Resistance to abrasion and solvents.

CHEMICAL STRUCTURE: Ethylene glycol adipate

USES:

MILLESTER 2D polyesters are recommended in particular for the manufacture of polyurethane:

– Castable elastomers

– Fabric Coatings

– Flexible adhesives

– Thermoplastics

– Polyurethane prepolymers

TYPICAL PROPERTIES	2-55D	2-110D
Hydroxyl Number	52-58	100-120
Molecular Weight, Avg.	2,040	1,020
Acid Number	<1.0	<1.0
Moisture, Percentage (as shipped)	<0.1	<0.1
Color, Gardner	<1	<1
Form @ 25˚ C	Solid	Solid
Liquid @ ˚C	65	60
Viscosity, Brookfield, cps @ 60˚ C	1,200	400

SHIPPING AND HANDLING

MILLESTER 2D polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 23

CHARACTERISTICS

MILLESTER 23 is a low reactivity difunctional polyester. It should be selected as raw material for the preparation of polyurethanes when final polymer properties are required, such as:

– High tensile and tear strength, hardness and resiliency.

– Resistance to abrasion and solvents.

CHEMICAL STRUCTURE: Ethylene glycol/propylene glycol adipate

USES:

MILLESTER 23 polyester is recommended in particular for the manufacture of polyurethane:

– Fabric coatings

– Flexible adhesives

– Castable elastomers

– Thermoplastics

– Polyurethane prepolymers

TYPICAL PROPERTIES	23-55
Hydroxyl Number	52-58
Molecular Weight, Avg.	2,000
Acid Number	<1.0
Moisture, Percentage (as shipped)	<0.1
Color, Gardner	<1
Form @ 25˚ C	Solid
Liquid @ ˚C	65
Viscosity, Brookfield, cps @ 60˚ C	1,150

SHIPPING AND HANDLING

MILLESTER 23 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 231

CHARACTERISTICS

MILLESTER 231 is a branched, fully saturated hydroxyl terminated polyester used in the preparation of polyurethane where the final properties required are:

– Good abrasion resistance.

– Excellent solvent resistance.

– High elasticity.

CHEMICAL STRUCTURE: Ethylene glycol/propylene glycol adipate branched

USES:

– Laminating adhesives

– Packaging adhesives

– Castable elastomers

– Microcelluar foams

– Polyurethane prepolymers

TYPICAL PROPERTIES	231-39
Hydroxyl Number	37-41
Molecular Weight, Avg.	2,900
Acid Number	<1.0
Moisture, Percentage (as shipped)	<0.1
Color, Gardner	<1
Viscosity @ 40˚ C cps	18,500
Viscosity @ 60˚ C cps	5,200
Functionality	<3.0

SHIPPING AND HANDLING

MILLESTER 231 polyesters are supplied in 55 gallon non-returnable steel drums, 515 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 232

CHARACTERISTICS

MILLESTER 232 is a branched, fully saturated hydroxyl terminated polyester used in the preparation of polyurethane where the final properties required are:

– High tensile and tear strength, hardness and resiliency.

– Resistance to abrasion and solvents.

– High elasticity.

CHEMICAL STRUCTURE: Ethylene glycol/propylene glycol adipate branched

USES:

– Laminating adhesives

– Packaging adhesives

– Castable elastomers

– Microcelluar foams

– Polyurethane prepolymers

TYPICAL PROPERTIES	232-43
Hydroxyl Number	41-45
Molecular Weight, Avg.	2,600
Acid Number	<1.0
Moisture, Percentage (as shipped)	<0.1
Color, Gardner	<1
Viscosity @ 40˚ C cps	23,500
Viscosity @ 60˚ C cps	6,400
Functionality	<3.0

SHIPPING AND HANDLING

MILLESTER 232 polyesters are supplied in 55 gallon non-returnable steel drums, 515 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 272

CHARACTERISTICS

MILLESTER 272 is a slightly branched aliphatic hydroxyl-terminated polyester. It is recommended for the preparation of polyurethanes in which the basic requirements include:

– A liquid polyester for ease of handling.

– High performance, high flex elastomers.

– Suitability for use in MDI systems.

– Excellent solvent resistance.

– Good low temperature properties.

CHEMICAL STRUCTURE: Ethylene glycol/butanediol adipate branched

USES:

– One shot cast elastomers

– Microcelluar foams

– Adhesives

– Coatings

– Polyurethane prepolymers

TYPICAL PROPERTIES	272-43
Hydroxyl Number	40-46
Molecular Weight, Avg.	2,600
Acid Number	<1.0
Moisture, Percentage (as shipped)	<0.1
Color, Gardner	<2
Form @ 25˚ C	Liquid
Viscosity, Brookfield, cps @ 40˚ C cps	6,000
Viscosity, Brookfield, cps @ 60˚ C cps	2,100
Pounds/Gallons @ 25˚ C	9.6

SHIPPING AND HANDLING

MILLESTER 272 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 3

CHARACTERISTICS

MILLESTER 3 are difunctional polyesters that should be considered for the preparation of polyurethanes, particularly for those applications in which the requirements include:

– A liquid polyester for ease of handling.

– Improved hydrolytic stability over most standard ethylene adipate polyesters.

– Softness and flexibility.

CHEMICAL STRUCTURE: Propylene glycol adipate

USES:

– Solution polymers for fabric coatings

– Bonding adhesives

– One shot castable elastomers

– Castable prepolymers

– Polyurethane prepolymers

TYPICAL PROPERTIES	3-42	3-46	3-55
Hydroxyl Number	38-46	41-51	52-58
Molecular Weight, Avg.	2,700	2,500	2,000
Acid Number	<1.0	<1.0	<1.0
Moisture, Percentage (as shipped)	0.1	0.1	0.1
Color, Gardner	<1	<1	<1
Form @ 25˚ C	Liquid	Liquid	Liquid
Viscosity, Brookfield, cps @ 25˚ C	26,500	12,250	12,500
Viscosity, Brookfield, cps @ 40˚ C	8,460	6,050	3,700
Viscosity, Brookfield, cps @ 60˚ C	2,140	1,650	1,000
Pounds/Gallons @ 25˚ C	9.4	9.4	9.4

SHIPPING AND HANDLING

MILLESTER 3 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 4

CHARACTERISTICS

MILLESTER 4 is a family of difunctional polyesters that are appropriate candidates for the preparation of polyurethanes in which:

– The liquid nature of the polyester itself is required for ease of processing.

– The predominant properties essential in the finished polymer include high elongation, softness and flexibility.

– Lower cost raw materials are essential.

CHEMICAL STRUCTURE: Diethylene glycol adipate

USES:

– These polyesters are recommended for the manufacture of end products in which combinations of the above properties are needed

– Coatings and adhesives for flexible substrates

– Low durometer elastomers both by prepolymer and one shot techniques

– Polyurethane prepolymers

TYPICAL PROPERTIES	4-37	4-44	4-55	4-115	4-220
Hydroxyl Number	34-40	41-47	52-58	105-125	210-235
Molecular Weight, Avg.	3,000	2,500	2,000	1,000	500
Acid Number	<1.0	<1.0	<1.0	<1.0	<1.0
Moisture, Percentage (as shipped)	<0.1	<0.1	<0.1	<0.1	<0.1
Color, Gardner	<2	<2	<2	<2	<1
Form @ 25˚ C	Liquid	Liquid	Liquid	Liquid	Liquid
Viscosity, Brookfield, cps @ 25˚ C	9,250	8,000	8,000	1,865	550
Viscosity, Brookfield, cps @ 40˚ C	6,200	4,400	3,000	700	215
Viscosity, Brookfield, cps @ 60˚ C	1,950	1,400	950	375	N/A
Pounds/Gallons @ 25˚ C	9.8	9.8	9.7	9.7	9.7

SHIPPING AND HANDLING

MILLESTER 4 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 410

CHARACTERISTICS

MILLESTER 410 is a family of difunctional polyesters that are appropriate candidates for the preparation of polyurethanes in those applications which:

– The liquid nature of the polyester itself is required for ease of processing.

– The predominant properties essential in the finished polymer include good tensile strength, tear resistance and better hydrolytic stability than MILLESTER 4.

– Lower cost raw materials are essential.

CHEMICAL STRUCTURE: Diethylene glycol adipate/isophthalate

USES:

– These polyesters are recommended for the manufacture of end products in which combinations of the above properties are needed

– Coatings and adhesives for flexible substrates

– Low durometer elastomers both by prepolymer and one shot techniques

– Polyurethane prepolymers

TYPICAL PROPERTIES	410-57
Hydroxyl Number	52-62
Molecular Weight, Avg.	2,000
Acid Number	<1.0
Moisture, Percentage (as shipped)	<0.1
Color, Gardner	<4
Form @ 25˚ C	Liquid
Viscosity, Brookfield, cps @ 60˚ C	5,700

SHIPPING AND HANDLING

MILLESTER 410 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 5

CHARACTERISTICS

MILLESTER 5 polyesters are slightly branched. They are recommended for the preparation of polyurethanes in those applications in which the basic requirements include:

– A liquid polyester for ease of handling.

– Final polymer properties such as good solvent resistance, softness, flexibility and elongation.

CHEMICAL STRUCTURE: Diethylene glycol adipate branched

USES:

MILLESTER 5 polyesters are useful for the manufacture of:

– Printing roller applications

– Flexible foams, coatings and adhesives

– Castable elastomers

– Polyurethane prepolymers

TYPICAL PROPERTIES	5-48	5-60
Hydroxyl Number	45-52	58-64
Molecular Weight, Avg.	2,300	1,800
Acid Number	<1.0	<1.5
Moisture, Percentage (as shipped)	<0.1	<0.1
Color, Gardner	<1	<1
Form @ 25˚ C	Liquid	Liquid
Viscosity, Brookfield, cps @ 25˚ C	15,000	14,000
Viscosity, Brookfield, cps @ 40˚ C	5,000	3,400
Viscosity, Brookfield, cps @ 60˚ C	1,700	1,100
Pounds/Gallons @ 25˚ C	9.7	9.7

SHIPPING AND HANDLING

MILLESTER 5 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 510

CHARACTERISTICS

MILLESTER 510 is a slightly branched hydroxyl terminated saturated polyester. This liquid polyester is based on mixed aliphatic-aromatic dibasic acids. Polyurethanes based on this unique polyester possess good chemical and solvent resistance coupled with toughness and aging resistance.

– A liquid polyester for ease of handling.

– Final polymer properties such as good solvent resistance, softness, flexibility and elongation.

CHEMICAL STRUCTURE: Diethylene glycol/mixed aliphatic aromatic dibasic acids branched

USES:

MILLESTER 510 is useful in the manufacture of:

– One shot cast elastomers

– Hard durable coatings

– Adhesives

– Microcellular foams

– Polyurethane prepolymers

TYPICAL PROPERTIES	510-125 ST
Hydroxyl Number	115-135
Molecular Weight, Avg.	900
Acid Number	<1.0
Moisture, Percentage (as shipped)	<0.1
Color, Gardner	<3
Form @ 25˚ C	Liquid
Viscosity, Brookfield, cps @ 25˚ C cps	10,200
Viscosity, Brookfield, cps @ 40˚ C cps	3,035
Viscosity, Brookfield, cps @ 60˚ C cps	770

SHIPPING AND HANDLING

MILLESTER 510 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 52

CHARACTERISTICS

MILLESTER 52 is a moderately branched, hydroxyl-terminated polyester which is an appropriate candidate for the preparation of polyurethane in those applications which:

– The liquid nature of the polyester itself is required for ease of processing.

– High isocyanate ration tolerance.

– Excellent flex life of polyurethane at low and ambient temperatures.

CHEMICAL STRUCTURE: Diethylene glycol adipate branched

USES:

This polyester is recommended for the manufacture of end products such as:

– One shot cast elastomers

– Microcellular foams

– Adhesives

– Polyurethane prepolymers

TYPICAL PROPERTIES	52-43
Hydroxyl Number	40-46
Molecular Weight, Avg.	2,600
Acid Number	<1.0
Moisture, Percentage (as shipped)	<0.1
Color, Gardner	<2
Form @ 25˚ C	Liquid
Viscosity, Brookfield, cps @ 40˚ C cps	8,500
Viscosity, Brookfield, cps @ 60˚ C cps	3,000
Pounds/Gallons @ 25˚ C	9.7

SHIPPING AND HANDLING

MILLESTER 52 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 51

CHARACTERISTICS

MILLESTER 51 polyester is slightly branched. It is recommended for the preparation of flexible polyurethanes. They are also used in those applications for the preparation of polyurethane foam in which the basic requirements include:

– A liquid polyester for ease of handling.

– Final polymer properties such as good solvent resistance, softness, flexibility and elongation.

CHEMICAL STRUCTURE: Glycerine branched diethylene glycol adipate

USES:

MILLESTER 51 is useful in the manufacture of:

– Flexible foams, coatings and adhesives

– Printing roller applications

– Castable elastomers

– Polyurethane prepolymers

TYPICAL PROPERTIES	51-43
Hydroxyl Number	49-57
Molecular Weight, Avg.	2,100
Acid Number	<1.0
Moisture, Percentage (as shipped)	<0.1
Color, Gardner	<2
Form @ 25˚ C	Liquid
Viscosity, Brookfield, cps @ 60˚ C cps	34,000
Pounds/Gallons @ 25˚ C	9.7

SHIPPING AND HANDLING

MILLESTER 51 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 7

CHARACTERISTICS

MILLESTER 7 difunctional polyesters are useful for the preparation of polyurethanes when the following polymer properties are sought:

– High crystallinity and hardness.

– High tensile strength and tear resistance.

– Resiliency and flexibility.

– Solvent resistance.

CHEMICAL STRUCTURE: 1,4 Butanediol adipate

USES:

These polyesters are recommended for the manufacture of:

– Thermoplastic elastomers

– Shoe adhesives

– Solution polymers

– Castable elastomers

– Polyurethane prepolymers

TYPICAL PROPERTIES	7-40	7-55	7-110	7-160
Hydroxyl Number	36-44	52-58	100-120	145-175
Molecular Weight, Avg.	2,800	2,000	1,000	700
Acid Number	<1.0	<1.0	<1.0	<1.0
Moisture, Percentage (as shipped)	<0.1	<0.1	<0.1	<0.1
Color, Gardner	<2	<2	<2	<2
Form @ 25˚ C	Solid	Solid	Solid	Solid
Liquid @ ˚C	65	65	60	40
Viscosity, Brookfield, cps @ 40˚ C	–	–	–	475
Viscosity, Brookfield, cps @ 60˚ C	3,150	1,470	385	–

SHIPPING AND HANDLING

MILLESTER 7 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 8

CHARACTERISTICS

MILLESTER 8 polyesters have relatively high branching. These products are suggested for the preparation of polyurethanes, especially when the following properties are primary objectives:

– A liquid polyester for ease of handling.

– Final polymer properties including solvent resistance, high tensile strength, hardness and outstanding abrasion resistance.

CHEMICAL STRUCTURE: 1,3 Butylene gylcol adipate branched

USES:

MILLESTER 8 polyesters are useful for the manufacture of:

– Maintenance coatings

– Adhesives

– Castable elastomers

– Polyurethane prepolymers

TYPICAL PROPERTIES	8-165
Hydroxyl Number	155-175
Molecular Weight, Avg.	680
Acid Number	<1.0
Moisture, Percentage (as shipped)	<0.1
Color, Gardner	<1
Form @ 25˚ C	Liquid
Viscosity, Brookfield, cps @ 40˚ C cps	12,500
Viscosity, Brookfield, cps @ 60˚ C cps	3,500
Pounds/Gallons @ 25˚ C	9.4

SHIPPING AND HANDLING

MILLESTER 8 polyesters are supplied in 55 gallon non-returnable steel drums, 500 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 9

CHARACTERISTICS

MILLESTER 9 difunctional polyesters are suggested for the preparation of polyurethanes when the requirements include:

– Outstanding resistance to hydrolysis and weathering over most standard ethylene adipate polyesters.

– Excellent heat stability over most standard ethylene adipate polyesters.

– Good tensile and tear strength coupled with flexibility.

– Good low temperature properties.

CHEMICAL STRUCTURE: 1,6 Hexanediol/neopentyl glycol adipate

USES:

– Solution polymers

– Fabric coatings

– One shot and prepolymer castable elastomers

– Polyurethane prepolymers

TYPICAL PROPERTIES	9-35	9-55	9-120
Hydroxyl Number	32-38	52-58	110-130
Molecular Weight, Avg.	3,200	2,000	935
Acid Number	<1.0	<1.0	<1.0
Moisture, Percentage (as shipped)	<0.1	<0.1	<0.1
Color, Gardner	<1	<1	<1
Form @ 25˚ C	Solid	Solid	Solid
Liquid @ ˚C	40	40	40
Viscosity, Brookfield, cps @ 60˚ C	3,500	1,400	320

SHIPPING AND HANDLING

MILLESTER 9 polyesters are supplied in 55 gallon non-returnable steel drums, 450 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 10

CHARACTERISTICS

MILLESTER 10 are difunctional polyesters that are especially useful for the preparation of polyurethanes when the final polymer properties should include combinations of the following:

– Excellent hydrolytic stability over most standard ethylene adipate polyesters.

– Outstanding heat aging and weathering over most standard ethylene adipate polyesters.

– High tensile strength and tear resistance.

– Resiliency and good low temperature properties.

CHEMICAL STRUCTURE: 1,6 Hexanediol adipate/isophthalate

USES:

– Solution polymers

– Fabric coatings

– Thermoplastic elastomers

– One shot and prepolymer castable elastomers

– Polyurethane prepolymers

TYPICAL PROPERTIES	10-35	10-75	10-120
Hydroxyl Number	32-38	70-80	110-130
Molecular Weight, Avg.	3,200	1,500	935
Acid Number	<1.0	<1.0	<1.0
Moisture, Percentage (as shipped)	0.1	0.1	0.1
Color, Gardner	<1	<1	<1
Form @ 25˚ C	Solid	Solid	Solid
Liquid @ ˚C	45	45	45
Viscosity, Brookfield, cps @ 60˚ C	6,000	1,250	475

SHIPPING AND HANDLING

MILLESTER 10 polyesters are supplied in 55 gallon non-returnable steel drums, 450 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 16

CHARACTERISTICS

MILLESTER 16 difunctional polyesters are especially useful for the preparation of polyurethanes when the final polymer properties should include combinations of the following:

– Excellent hydrolytic stability over most standard ethylene adipate polyesters.

– Outstanding heat aging and weathering over most standard ethylene adipate polyesters.

– High tensile strength and tear resistance.

– Resistance to abrasion and solvents.

CHEMICAL STRUCTURE: 1,6 Hexanediol adipate

USES:

MILLESTER 16 polyesters are recommended in particular for the manufacture of polyurethane:

– Solution polymers

– Fabric coatings

– Thermoplastic elastomers

– One shot and prepolymer castable elastomers

– Polyurethane prepolymers

TYPICAL PROPERTIES	16-28	16-35	16-40	16-55	16-110	16-160
Hydroxyl Number	25-31	32-38	36-44	52-58	100-120	145-175
Molecular Weight, Avg.	4,000	3,200	2,800	2,000	1,000	700
Acid Number	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Moisture, Percentage (as shipped)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Color, Gardner	<1	<1	<2	<1	<1	<1
Form @ 25˚ C	Solid	Solid	Solid	Solid	Solid	Solid
Liquid @ ˚C	60	60	60	60	60	60
Viscosity, Brookfield, cps @ 60˚ C	4,600	3,300	2,500	1,100	325	170

SHIPPING AND HANDLING

MILLESTER 16 polyesters are supplied in 55 gallon non-returnable steel drums, 450 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.

MILLESTER 253

CHARACTERISTICS

MILLESTER 253 are a family of difunctional polyesters which are appropriate candidates for the preparation of polyurethanes in those applications which:

– The liquid nature of the polyester is required for ease of processing.

– The predominant properties essential in the finished polymer include excellent heat aging, weatherability and hydrolysis resistance over most standard etheylene adipate polyesters.

CHEMICAL STRUCTURE: Neopentyl glycol adipate

USES:

– Coatings and adhesives for flexible substrates

– Wood coatings

– Polyurethane prepolymers

TYPICAL PROPERTIES	253-55	253-110	253-190
Hydroxyl Number	52-58	110-120	175-205
Molecular Weight, Avg.	2,000	1,000	600
Acid Number	<1.0	<1.0	<1.0
Moisture, Percentage (as shipped)	<0.1	<0.1	<0.1
Color, Gardner	<2	<2	<2
Form @ 25° C	Liquid	Liquid	Liquid
Viscosity, Brookfield @ 25° C	–	–	2,800
Viscosity, Brookfield, cps @ 60° C	2,300	700	275

SHIPPING AND HANDLING

MILLESTER 253 polyesters are supplied in 55 gallon non-returnable steel drums, 450 lb. net. Samples are available for initial evaluations. Intermediate quantities for development purposes will be furnished on request. These polyesters are slightly hygroscopic; exposure to the atmosphere should be kept to a minimum.


PSC

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