itwc inc.
urethane solutions

Product Summary

Prepolymers * Polyesters * Polyols * Extenders * Catalysts * Additives

PO Box 247 ■ 106 Main Street ■ Malcom, IA 50157
641.528.3000 ■ Toll Free: 888.489.2462 ■ Fax: 641-528-4041 ■ www.itwcinc.com

itwc inc.
urethane solutions

Urethane Solutions for Any Application

- Cast Elastomers
- Spray Elastomers
- Microcellular Foam
- Integral Skin Foam
- Flexible Molded Foam
- Semi-flexible Molded Foam
- Rigid Foam
- Coatings
- Adhesives
- Sealants

With over 250 combined years of technical experience in polymers and polyurethane, ITWC, Inc. can be your resource for urethane solutions. One of our strengths is the ability to custom blend and produce urethane products for specific customer applications. We welcome the opportunity to work closely with customers to confidentially develop urethane solutions.

For more information, contact your ITWC, Inc. representative today. We look forward to being your resource for urethane solutions.

- Prepolymers – MDI, TDI, HMDI, IPDI
- Quazi-Prepolymers – MDI
- Modified MDI – polymeric, monomeric
- Polyesters
- Polyethers
- Extenders
- Additives
- Catalysts
- Customized Polyurethane Systems
- Renewable Resources

2009

Table of Contents - Product Summary

Any polyurethane product and/or product combination in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product(s) in that application. The information provided herein is a guideline to assist in material selection and must not be considered as a recommendation. Please contact your ITWC, Inc. representative for assistance.

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2009

Xthane - IT Series

Aromatic Isocyanate Prepolymer

Modified Diphenylmethane Diisocyanate (MDI) Terminated Polyester Prepolymer

ITWC, Inc.	% NCO	Viscosity @ 80°C	Hardness	Suggested Applications
			using EXT-1006	
IT-11	8.9 - 9.2	770	95A	flexible foam, microcellular, coatings, adhesives
IT-11x9.6	9.5 - 9.7	600	-	flexible foam, microcellular, coatings, adhesives
IT-16	6.3 - 6.7	2000	95A	flexible foam, microcellular, coatings, adhesives
IT-22	6.5 - 6.75	1460	86A	high performance cast elastomers
IT-22x6.9	6.75 - 6.95	1250	91A	high performance cast elastomers
IT-22x 10.7	10.6 - 10.8	475	-	high performance cast elastomers
IT-22x12.5	12.5 - 12.8	320	57D	high performance cast elastomers
IT-25	8.0 - 8.3	1300	93A	microcellular, cast elastomers, spray elastomers, adhesives
IT-25x7.7	7.6 - 7.8	1470	-	microcellular, cast elastomers, spray elastomers, adhesives
IT-32	6.4 - 6.7	1800	85A	high property elastomers, elastomeric coatings, adhesives
IT-32x9.5	9.2 - 9.6	730	95A	high property elastomers, elastomeric coatings, adhesives
IT-321	9.2 - 9.6	900	95A	high property elastomers, elastomeric coatings, adhesives
IT-33	6.9 - 7.2	1560	87A	high property elastomers, elastomeric coatings, adhesives
IT-331	7.6 - 7-9	1300	93A	high property elastomers, elastomeric coatings, adhesives
IT-332	7.8 - 8.1	1300	-	high property elastomers, elastomeric coatings, adhesives
IT-34	7.6 - 7.9	1300	88A	high property elastomers, elastomeric coatings, adhesives
IT-341	8.0 - 8.4	1450	-	high property elastomers, elastomeric coatings, adhesives

Xthane - IC Series

Aromatic Isocyanate Prepolymer - Caprolactone

ITWC, Inc.	% NCO	Viscosity @ 80°C	Hardness	Suggested Applications
IC-85	6.8 - 7.0	950	86A	high property elastomers, elastomeric coatings, adhesives
IC-95	8.4 - 8.7	700	-	high property elastomers, elastomeric coatings, adhesives

Xthane prepolymers are isocyanate (NCO) terminated products that may be paired with a variety of extenders and additives to achieve the desired results. As with any polyurethane product, use of an Xthane prepolymer in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product or product combination for each specific application. The above information is provided as a guideline for material selection and is not to be considered as a recommendation. Please contact your sales representative for material selection assistance.

Health and Safety Information:

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Xthane - IT Series

Aromatic Isocyanate Prepolymer

Modified Diphenylmethane Diisocyanate (MDI) Terminated Polyester Prepolymer

Typical Physical Properties		IT-11	IT-16	IT-22	IT-25	IT-32	IT-321	IT-33	IT-331	IC-85
Hardness	Shore A	95	95	86	93	85	95	87	93	86
	Shore D	43	43	-	41	-	-	-	-	-
Resilience	% Rebound	18	40	32	50	40	30	42	43	52
Split Tear Strength	PLI	400	520	357	320	175	300	175	260	290
Die C Tear Strength	PLI	705	600	520	600	390	600	500	500	490
Tensile Strength	PSI	7500	6900	7000	7000	6000	7000	6500	6000	6900
Ultimate Elongation	%	450	480	596	470	560	550	540	500	520
100% Modulus	PSI	1500	1550	725	1110	750	1400	925	825	760
200% Modulus	PSI	2500	1750	1070	1680	1010	1800	1200	1180	1120
300% Modulus	PSI	3800	2170	1761	2800	1380	2500	1700	1694	1725
Compression Set	%	33	29	30	15	25	20	18	25	23
Compression Deflection	15%	800	1820	459	615	490	800	400	603	
Taber Abrasion	Mg Loss	28	-	14	15	-	22	16	16	

Processing Characteristics using EXT-1006		IT-11	IT-16	IT-22	IT-25	IT-32	IT-321	IT-33	IT-331	IC-85
NCO Range	%	8.9 - 9.2	6.3 - 6.7	6.5 - 6.7	8.0 - 8.3	6.3 - 6.5	9.2 - 9.6	6.9 - 7.2	7.8 - 8.1	6.8 - 7.0
NCO / OH Ratio		1.05	1.05	1.03	1.05	1.05	1.05	1.05	1.05	1.03
Prepolymer Temperature	°F	180	180	180	180	180	180	200	200	200
Extender Temperature	°F	140	140	140	140	150	140	110	110	150
Mold temperature	°F	240	240	240	240	230	240	260	260	260
Pot Life	Minutes	4 - 7	2 - 4	4 - 6	2 - 4	7 - 8	4 - 5	3 - 8	5 - 6	9 - 11
Demold Time	Minutes	30 - 35	15 -20	35 - 45	15 -20	70	60	30 - 35	35	30 - 35
Other NCO's Available	%	9.6		6.9;7.7;11;12.5	7.7; 8.7; 9.4	7.7; 8.5; 9.5		9.2; 11		

Storage & Handling of MDI Prepolymers		
Storage Temperature:	Ambient to 90°F	Store in tightly closed containers to prevent moisture contamination.
Average Shelf Life:	6 months	Do not reseal if contamination is suspected. Do not breath vapors.
Use of a dry nitrogen blanket for partial drums is recommended.		Employee training in the safe use & handling of these materials is required.

As with any product, use of an MDI prepolymer in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product or product combination for each specific application. The above information is provided as a guideline for material selection and is not to be considered as a recommendation. Please contact your sales representative for material selection assistance.

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2009

Xthane - IE Series

Aromatic Isocyanate Prepolymer

Modified Diphenylmethane Diisocyanate (MDI) Terminated Polyether Prepolymer

ITWC, Inc.	% NCO	Viscosity @ 80°C	Hardness	Suggested Applications
			using EXT-1006	
IE-75	4.0 - 4.3	2880	75A	high resilience applications
IE-80	4.9 - 5.3	2000	83A	high resilience applications
IE-85	6.1 - 6.3	1200	85A	high resilience applications
IE-87	6.3 - 6.5	1180	87A	high resilience applications
IE-90	7.1 - 7.4	1050	90A	high resilience applications
IE-95	8.4 - 8.6	650	95A	high resilience applications
IE-98	8.6 - 8.9	700	98A	high resilience applications
IE-99	9.2 - 9.4	600	50D	high resilience applications
IE-100	9.8 - 10.1	300	95A	high resilience applications

Xthane prepolymers are isocyanate (NCO) terminated products that may be paired with a variety of extenders and additives to achieve the desired results. As with any polyurethane product, use of an Xthane prepolymer in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product or product combination for each specific application. The above information is provided as a guideline for material selection and is not to be considered as a recommendation. Please contact your sales representative for material selection assistance.

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Xthane - IE Series

Aromatic Isocyanate Prepolymer

Modified Diphenylmethane Diisocyanate (MDI) Terminated Polyether Prepolymer

Typical Physical Properties using EXT 1006		IE-75	IE-80	IE-85	IE-87	IE-90	IE-95	IE-98
Viscosity	80°C mPa.s	2880	2130	1675	1300	1200	1050	950
Hardness	Shore A	75	83	85	87	90	95	98
Resilience	% Rebound	65	72	68	69	66	62	60
Split Tear Strength	PLI	80	85	80	120	90	130	140
Die C Tear Strength	PLI	340	353	380	440	410	450	470
Tensile Strength	PSI	4200	3840	3950	4200	4100	4200	4300
Ultimate Elongation	%	480	420	425	530	430	410	390
100% Modulus	PSI	600	980	1100	970	1250	1450	1550
300% Modulus	PSI	1200	1269	2300	1700	2450	-	2060
Compression Set	%	17	15	16	14	15	14	20

Processing Characteristics using EXT 1006		IE-75	IE-80	IE-85	IE-87	IE-90	IE-95	IE-98
NCO Range	%	4.0 - 4.3	4.9 - 5.2	6.1 - 6.3	6.3 - 6.5	7.1 - 7.4	8.4 - 8.6	8.6 - 8.9
NCO / OH Ratio		1.05	1.05	1.05	1.05	1.05	1.05	1.05
Prepolymer Temperature	°F	175	175	175	175	170	170	175
Extender Temperature	°F	110	110	110	110	110	110	110
Mold temperature	°F	212	212	212	212	220	220	220
Pot Life	Minutes	25 - 30	15 - 19	12	12	6 - 9	6	3.2
Demold Time	Minutes	120 - 180	90	60	45	40	30	30

Storage & Handling of MDI Prepolymers		
Storage Temperature:	Ambient to 90°F	Store in tightly closed containers to prevent moisture contamination.
Average Shelf Life:	6 months	Do not reseal if contamination is suspected. Do not breath vapors.
Use of a dry nitrogen blanket for partial drums is recommended.		Employee training in the safe use & handling of these materials is required.

Xthane IE series prepolymers may be paired with a variety of extenders and additives to achieve the desired properties and finishes in the final products. As with any polyurethane product, use of an MDI prepolymer in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product or product combination for each specific application. The above information is provided as a guideline for material selection and is not to be considered as a recommendation. Please contact your sales representative for material selection assistance.

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2009

IP / IPM Series

Aromatic Isocyanate Prepolymers - Modified Diphenylmethane Diisocyanate (MDI) Terminated Polyether Prepolymer

ITWC, Inc.	f	NCO, %	Specific Gravity	Viscosity	Hardness	Applications
					using EXT-1006	
IP-02	2.0	2.4 - 2.8	1.01	50000 @ 25°C	-	gel formulations
IP-04	2.0	4.0 - 4.4	1.05	14000 @ 25°C	-	gel formulations
IP-041	2.0	4.5 - 4.85	1.04	12000 @ 25°C	61A	elastomers, microcellular, integral skin, semi-flexible foam
IP-85	2.0	10.8 - 11.4	1.05	125 @ 93.3°C	95A	solid elastomers, spray elastomers, adhesives, binders
IP-87	2.0	8.9 - 9.4	1.07	220 @ 80°C	92A	solid elastomers, spray elastomers, adhesives, binders
IP-89	2.0	8.8 - 9.2	1.107	250 @ 80°C	97A	solid elastomers, spray elastomers, adhesives, binders
IP-90	2.0	8.6 - 8.9	1.05	300 @ 80°C	90A	solid elastomers, spray elastomers, adhesives, binders
IP-91	2.0	8.9 - 9.2	1.11	325 @ 80°C	87A	cast elastomers
IPM-08	2.0	7.8 - 8.2	1.09	2450 @ 25°C	71A	one component binders, two component cast elastomers
IPM-10	2.1	9.7 - 10.2	1.09	2700 @ 25°C	-	two component binders, sealants, coatings
IPM-101	2.1	10.7 - 11.1	1.11	1800 @ 25°C	-	two component binders, sealants, coatings

IR Series

Aromatic Iscyanate Prepolymers - Modified Diphenylmethane Diisocyanate (MDI) Terminated Bio-based Prepolymer

ITWC, Inc.	f	NCO, %	Specific Gravity	Type	Bio Content	Applications
IR-95	2.0	9.0 - 9.3	1.173	polyester	65%	high performance cast elastomer applications
IR-98	2.0	8.6 - 8.9	1.079	bio-based polyether	66%	high performance cast elastomer applications

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2009

Xthane - IW Series

Aliphatic Diisocyanate Prepolymers - Modified Dicyclohexylmethane 4,4' diisocyanate (HMDI) Prepolymers

ITWC, Inc.	Type	NCO, %	Specific Gravity	Viscosity	Applications
IW-C20	Caprolactone	19.8 - 20.2	1.08	700 @ 25°C	elastomers
IW-E12	PTMEG	11.8 - 12.4	1.04	410 @ 76°C	soft elastomers, energy absorbing foams
IW-E18	PTMEG	17.9 - 18.5	1.05	1000 @ 25°C	soft elastomers, energy absorbing foams
IW-E20	PTMEG	19.8 - 20.4	1.07	850 @ 25°C	soft elastomers, energy absorbing foams
IW-P26	PPG	25.8 - 26.6	1.07	120 @ 25°C	cast elastomers, high hardness applications
IW-P261	PPG	25.8 - 27.0	1.08	400 @ 25°C	cast elastomers such as tooling resins
IW-T18	Polyester	17.8 - 18.2	1.12	1600 @ 25°C	elastomers
IW-T20	Polyester	19.8 - 20.2	1.11	950 @ 25°C	elastomers

Xthane - II Series

Cycloaliphatic Diisocyanate Prepolymers - Modified Isophorone Diisocyanate (IPDI) Prepolymers

ITWC, Inc.	Type	NCO, %	Specific Gravity	Viscosity	Applications
II-P03	PPG	3.0 - 3.4	1.02	5000 @ 25°C	cast elastomers, coatings, sealants, adhesives
II-P16	PPG	15.8 - 16.2	1.07	400 @ 25°C	cast elastomers, coatings, sealants, adhesives
II-T12	Polyester	12.0 - 13.0	1.15	6500 @ 25°C	cast elastomers, coatings, sealants, adhesives
II-T121	Polyester	12.0 - 13.0	1.15	8000 @ 25°C	cast elastomers, coatings, sealants, adhesives

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QZ-E Series

Quazi Prepolymers

Modified Diphenylmethane Diisocyanate (MDI) Terminated Polyether Prepolymers

ITWC, Inc.	f	%NCO	Type	Viscosity	Applications
QZ-E11	2.0	14.7 - 15.2	Modified MDI - PTMEG	350 @ 50°C	microcellular, integral skin, semiflexible foams
QZ-E12	2.0	12.2 - 12.8	Modified MDI - PTMEG	650 @ 60°C	high performance cast elastomers
QZ-E13	2.0	12.9 - 13.2	Modified MDI - PTMEG	3000 @ 25°C	microcellular, integral skin, semiflexible foams, cast elstomers
QZ-E131	2.0	12.9 - 13.2	Modified MDI - PTMEG	3000 @ 25°C	microcellular, integral skin, semiflexible foams, cast elstomers
QZ-E132	2.0	13.25 - 13.55	Modified MDI - PTMEG	2600 @ 45°C	ideal processing characteristics for machine mixing or hand batching
QZ-E181	2.0	17.9 - 18.6	Modified MDI - PTMEG	350 @ 25°C	microcellular, integral skin, semiflexible foams
QZ-E22	2.0	14.7 - 15.2	Modified MDI - PTMEG	550 @ 50°C	microcellular, integral skin, semiflexible foams
QZ-E23	2.0	22.8 - 23.2	Modified MDI - PTMEG	350 @ 25°C	microcellular, integral skin, semiflexible foams

QZ-P Series

Modified Diphenylmethane Diisocyanate (MDI) Terminated Polyether Prepolymers

ITWC, Inc.	f	%NCO	Type	Viscosity	Applications
QZ-P15	2.0	15.5 - 16.1	Modified 4,4' MDI	700 @ 25°C	cast elastomers, coatings
QZ-P16	2.0	16.2 - 16.7	Modified 4,4' MDI	600 @ 25°C	cast elastomers, spray elastomers, integral skin, binders, adhesives
QZ-P161	2.07	16.2 - 16.7	Modified 4,4' MDI	650 @ 25°C	cast elastomers, spray elastomers, integral skin, binders, adhesives
QZ-P162	2.0	15.5 - 17.5	Modified 4,4' MDI	5500 @ 25°C	one and two component moisture cure coatings or sealants
QZ-P17	2.17	14.9 - 15.3	Modified 4,4' MDI	400 @ 25°C	cast elastomers, coatings
QZ-P21	2.1	21.3 - 21.9	Modified 4,4' MDI	425 @ 25°C	cast elastomers, coatings
QZ-P23	2.0	22.7 - 23.2	Modified 4,4' MDI	650 @ 25°C	elastomers, microcellular, integral skin, semi-flexible foams
QZ-P231	2.1	22.8 - 23.3	Modified 4,4' MDI	1200 @ 25°C	cast elastomers, spray elastomers, binders, sealants, adhesives
QZ-P232	2.0	23.0 - 23.5	Modified 4,4' MDI	800 @ 25°C	cast elastomers, spray elastomers, binders, sealants, adhesives
QZ-P24	2.22	24.2 - 24.8	Modified 4,4' MDI	225 @ 25°C	one and two component polyurethane coatings and sealants
QZ-P251	2.2	24.5 - 26.5	Modified 4,4' MDI	200 @ 25°C	cast elastomers, coatings
QZ-P260	2.1	25.8 - 26.4	Modified 4,4' MDI	200 @ 25°C	cast elastomers, coatings
QZ-P261	2.1	26.0 - 26.6	Modified 4,4' MDI	150 - 175 @ 25°C	cast elastomers, coatings

2009

QZ-R Series

Quazi Prepolymers - Biobased MDI Terminated Prepolymer

ITWC, Inc.		% NCO	Bio Content	Viscosity	Applications
QZ-R16		16.0 - 16.7	17%	2292 @ 25°C	microcellular, integral skin, semiflexible foams, elastomers
QZ-R20		19.8 - 20.4	28%	650 @ 25°C	microcellular, integral skin, semiflexible foams, elastomers
QZ-R201		19.8 - 20.4	22%	1220 @ 25°C	microcellular, integral skin, semiflexible foams, cast elastomers
QZ-R23		22.8 - 23.4	22%	350 @ 25°C	microcellular, integral skin, semiflexible foams, cast elastomers
QZ-R231		22.8 - 23.4	25%	250 @ 25°C	microcellular, integral skin, semiflexible foams, cast elastomers

QZ-T Series

Modified Diphenylmethane Diisocyanate (MDI) Terminated Polyester Prepolymers

ITWC, Inc.	f	% NCO	Specific Gravity	Viscosity	Applications
QZ-T19	2.0	18.8 - 19.2	1.20	900 - 1200 @ 25°C	microcellular, integral skin, semi-flexible urethane foams
QZ-T191	2.0	18.8 - 29.2	1.20	1350 @ 25°C	microcellular, integral skin, semi-flexible urethane foams
QZ-T23	2.0	23.1 - 23.5	1.21	340 @ 25°C	microcellular, integral skin, semi-flexible urethane foams

Xthane QZ quazi-prepolymers are isocyanate (NCO) terminated products that may be paired with a variety of extenders and additives to achieve the desired results. As with any polyurethane product, use of a QZ prepolymer in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product or product combination for each specific application. The above information is provided as a guideline for material selection and is not to be considered as a recommendation. Please contact your sales representative for material selection assistance.

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2009

Xthane - QZ Series

Modified Diphenylmethane Diisocyanate (MDI) Terminated Prepolymers

ITWC, Inc.	f	%NCO	Type	Viscosity	Applications
QZ-29	2.1	29.0 - 30.0	Modified 4,4' MDI	25 @ 25°C	microcellular foams, solid elastomers
QZ-30	2.01	32.6 - 33.2	Modified 4,4' MDI	20 @ 35°C	prepolymers, microcellular foam, adhesives, sealants
QZ-33	2.8	31.3 - 31.7	Polymeric MDI	200 @ 25°C	elastomers, coatings, adhesives
QZ-34	2.0	33.5	Modified 2,4' MDI	15 @ 25°C	foams, cast elastomers, coatings, adhesives, specialty chemicals
QZ-270	2.41	27.1 - 28.1	Modified Polymeric MDI	300 @ 25°C	semi-rigid foams, elastomers, coatings, adhesives
QZ-271	2.2	27.5 - 28.5	Modified Polymeric MDI	140 @ 25°C	semi-rigid foams, elastomers, coatings, adhesives
QZ-272	2.16	26.6 - 27.4	Modified Polymeric MDI	240 - 400 @ 25°C	rigid foam
QZ-310	2.8	31.4 - 32	Polymeric MDI	150 - 250 @ 25°C	elastomers, rigid foams, binders, adhesives
QZ-320	2.4	31.8 - 32.7	Polymeric MDI	60 @ 25°C	high property specialty elastomers
QZ-321	2.4	32.0 - 32.6	Polymeric MDI	40 @ 25°C	coatings, elastomers, flexible molded foams
QZ-322	2.4	32.0	Polymeric MDI	66 @ 25°C	coatings, adhesives, elastomers, flexible molded foams
QZ-323	2.4	31.7 - 32.3	Polymeric MDI	55 @ 25°C	coatings, adhesives, elastomers, flexible molded foams
QZ-324	2.7	31.0 - 32.0	Polymeric MDI	180 @ 25°C	two part coatings systems, elastomers, adhesives, specialty foams

Xthane QZ prepolymers are isocyanate (NCO) terminated products that may be paired with a variety of extenders and additives to achieve the desired results. As with any polyurethane product, use of a QZ prepolymer in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product or product combination for each specific application. The above information is provided as a guideline for material selection and is not to be considered as a recommendation. Please contact your sales representative for material selection assistance.

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2009

Xthane - TC Series

Modified Toluene Diisocyanate (TDI) Terminated Prepolymer

ITWC, Inc.	% NCO	Hardness	Viscosity	Type	Suggested Applications
		with MOCA *			
TC-90E	3.9 - 4.3	90A	600 @ 100°C	Polyether	high property elastomers, elastomeric coatings, adhesives
TC-95E	6.0 - 6.5	95A	250 @ 100°C	Polyether	high property elastomers, elastomeric coatings, adhesives
TC-85P	3.3 - 3.6	85A	150 @ 100°C	Polyether	medium property elastomers, elastomeric coatings, adhesives
TC-87P	5.1 - 5.4	90A	180 @ 100°C	Polyether	medium property elastomers, elastomeric coatings, adhesives
TC-90P	6.0 - 6.3	90A	400 @ 80°C	Polyether	medium property elastomers, elastomeric coatings, adhesives
TC-95P	6.2 - 6.5	95A	215 @ 80°C	Polyether	medium property elastomers, elastomeric coatings, adhesives
TC-D60E	7.1 - 7.4	60D	390 @ 100°C	Polyether	high property elastomers, elastomeric coatings, adhesives
TC-D75P	7.3 - 7.7	75D	340 @ 100°C	Polyether	high property elastomers, elastomeric coatings, adhesives
TC-70S	2.4 - 2.7	70A	594 @ 100°C	Polyester	high property elastomers, elastomeric coatings, adhesives
TC-80S	3.0 - 3.3	80A	1500 @ 100°C	Polyester	high property elastomers, elastomeric coatings, adhesives
TC-80S2	3.2 - 3.4	83A	1000 @ 100°C	Polyester	high property elastomers, elastomeric coatings, adhesives
TC-85S	3.8 - 4.2	85A	900 @ 100°C	Polyester	high property elastomers, elastomeric coatings, adhesives
TC-85SQM	3.3 - 3.7	86A	1000 @ 100°C	Polyester	high property elastomers, elastomeric coatings, adhesives
TC-87S	3.2 - 4.0	87A	850 @ 100°C	Polyester	high property elastomers, elastomeric coatings, adhesives
TC-90S	4.0 - 4.4	90A	800 @ 100°C	Polyester	high property elastomers, elastomeric coatings, adhesives
TC-90S2	5.4 - 5.7	90A	695 @ 100°C	Polyester	high property elastomers, elastomeric coatings, adhesives

* 4,4' methylene bis-(orthochloroanline)

Xthane TC prepolymers produce high performance elastomers with excellent elasticity, high modulus, good compression set and dimensional stability. These prepolymers may be extended with glycols or amines to give finished elastomers a wide range of properties. As with any product, use of a TDI prepolymer in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product(s) in that application. The above information is provided as a guideline to assist in material selection however it must not be considered as a recommendation. Please contact your ITWC, Inc. sales representative for material selection assistance.

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Xthane - TD Series

Toluene Diisocyanate (TDI) Terminated Prepolymer

ITWC, Inc.	% NCO	Hardness	Viscosity @ 100°C	Type	Suggested Applications
		with MOCA			
TD-D72E	8.9 - 9.3	70 - 75D	1000 @ 70°C	Polyether	high property elastomers, elastomeric coatings, adhesives
TD-D75E	9.5 - 9.8	75D	230	Polyether	high property elastomers, elastomeric coatings, adhesives
TD-92E	4.8 - 5.1	92A	300	Polyether	high property elastomers, elastomeric coatings, adhesives
TD-93E	4.9 - 5.3	93A	350	Polyether	high property elastomers, elastomeric coatings, adhesives
TD-95E	6.0 - 6.5	95A	250	Polyether	high property elastomers, elastomeric coatings, adhesives
		with MBCA			
TD-D50S	5.0 - 5.3	97A	690	Polyester	high property elastomers, elastomeric coatings, adhesives
TD-66S	2.8 - 3.1	63A	1145	Polycaprolactone	high property, low hardness elastomers
TD-80S	3.0 - 3.3	83A	750	Polyester	high property elastomers, elastomeric coatings, adhesives
TD-90S	4.0 - 4.4	90A	700	Polyester	high property elastomers, elastomeric coatings, adhesives
TD-90S2	4.6 - 4.9	90A	600	Polyester	high property elastomers, elastomeric coatings, adhesives
		MOCA = 4,4' methylene bis-(orthochloroanline); MBCA = 4,4' methylene-bis(2-chloroanline)			

ITWC, Inc.	% NCO	Solids, wt %	Viscosity @ 25°C	Type	Suggested Applications
TD-11P	2.4 blocked	100	60000 - 120000	branched aromatic	epoxy resins, membranes, sealants, casting compounds
TD-12P	1.7 blocked	100	23000 - 43000	linear aromatic	epoxy resins, membranes, sealants, casting compounds

Xthane TD prepolymers produce high performance elastomers with excellent elasticity, high modulus, good compression set and dimensional stability.
These prepolymers may be extended with glycols or amines to give finished elastomers a wide range of properties.
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Xthane - TLF Series

Toluene Diisocyanate (TDI) Terminated Prepolymer

ITWC, Inc.	% NCO	Hardness	Viscosity @ 100°C	Type	Suggested Applications
		with MBCA			
TLF - 80E	2.7 - 2.9	80A	2000	Polyether	high property elastomers, coatings, adhesives
TLF - 85E	3.2 - 3.4	83A	650	Polyether	high property elastomers, coatings, adhesives
TLF - 90E	4.0 - 4.3	90A	550	Polyether	high property elastomers, coatings, adhesives

MOCA = 4,4' methylene bis-(orthochloroanline); MBCA = 4,4' methylene-bis(2-chloroanline)

Xthane TLF prepolymers produce high performance elastomers with excellent elasticity, high modulus, good compression set and dimensional stability.
These prepolymers may be extended with glycols or amines to give finished elastomers a wide range of properties.
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Renewable Resources

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QZ-R Series Quazi Prepolymers - Biobased MDI Terminated Prepolymer

ITWC, Inc.	% NCO	Type	Bio Content	Viscosity	Applications
QZ-R16	16.0 - 16.7	polyether/caster oil	17%	700 @ 25°C	microcellular, integral skin, semiflexible foams, cast elastomers
QZ-R20	19.8 - 20.4	caster oil	28%	650 @ 25°C	microcellular, integral skin, semiflexible foams, cast elastomers
QZ-R201	19.8 - 20.4	caster oil	22%	1220 @ 25°C	microcellular, integral skin, semiflexible foams, cast elastomers
QZ-R23	22.8 - 23.4	caster oil	22%	350 @ 25°C	microcellular, integral skin, semiflexible foams, cast elastomers
QZ-R231	22.8 - 23.4	polyether	25%	250 @ 25°C	microcellular, integral skin, semiflexible foams, cast elastomers

IR Series Biobased Aromatic Isocyanate Prepolymer

Modified Diphenylmethane Diisocyanate (MDI) Terminated Prepolymer

ITWC, Inc.	% NCO	Type	Bio Content	Viscosity	Suggested Applications
IR-95	9.0 - 9.3	Polyester	20%	950 @ 80°C	high performance cast elastomer applications
IR-98	8.6 - 8.9	Polyether	66%	480 @ 80°C	cast elastomer applications

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Renewable Resources

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Poly-S PAR Polyesters - Propanediol Adipate

ITWC, Inc.	f	Molecular Weight	Hydroxyl Number (mg KOH/g)	Bio Content %	Specific Gravity	Applications
Poly S 500PAR	2	500	215 - 235	45.0	1.15	microcellular shoe soles, elastomers, coatings, adhesives
Poly S 1000PAR	2	1,000	105 - 115	40.0	1.14	microcellular shoe soles, elastomers, coatings, adhesives
Poly S 2000PAR	2	2,000	52 - 58	37.0	1.14	microcellular shoe soles, elastomers, coatings, adhesives

Extenders Bio-based Extenders and Curatives

ITWC, Inc.		Equiv. Wt.	Type	Bio Content	Density	Applications
EXT-1034		38.0	Propanediol	100%	1.05	renewable resource alternative to butanediol
EXT-3002		342.0	Castor Oil	100%	0.96	coatings

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Poly-E

Polyethers

ITWC, Inc.	f	Molecular Weight	Hydroxyl Number	Water Content	Specific Gravity	Type
Poly E 1000	2	1,000	106.9 - 118.1	150 ppm	0.98	polytetramethylene ether glycol
Poly E 2000	2	2,000	54.7 - 57.5	150 ppm max	0.98	polytetramethylene ether glycol

Poly-P

Polyethers

ITWC, Inc.	f	Molecular Weight	Hydroxyl Number	Water Content	Specific Gravity	Type
Poly P 253	3	250	670	0.04 max	1.09	polypropylene oxide based triol
Poly P 400	2	400	260 - 300	0.05 max	1.00	polypropylene oxide based diol
Poly P 703	3	700	233 - 243	0.05 max	1.02	polypropylene oxide based triol
Poly P 1000	2	1,000	107 - 117	0.03 max	0.99	polypropylene glycol
Poly P 2000	2	2,000	54 - 58	0.03 max	1.00	polypropylene glycol
Poly P 4000	2	4,000	28.0	0.02 max	1.001	propylene glycol-based diol
Poly P 4010	2	4,000	25 - 31	0.05 max	1.03	polypropylene modified with ethylene oxide
Poly P 5013	3	5,000	34.5 - 37.5	0.05 max	1.02	polyoxypropylene modified with ethylene oxide
Poly P 6013	3	6,000	26 - 30	0.05 max	1.01	polyoxypropylene modified with ethylene oxide

Polyether polyols may be used in a variety of ways to enhance polyurethane systems for elastomers, microcellular, integral skin, molded foam, adhesives, coatings, spray elastomers, flexible foams, rigid foams, to yield an endless list of products with a wide range of properties. For material selection assistance, contact your ITWC, Inc. representative.

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Poly-S Polyesters

ITWC, Inc.	f	Molecular Weight	Hydroxyl Number	Acid Number	Specific Gravity	Type
			mg KOH/g	mg KOH/g		
Poly S 1000EA	2	1,000	105 - 115	0.9 max	1.20	ethylene adipate
Poly S 2000EA	2	2,000	52 - 58	0.9 max	1.28	ethylene adipate
Poly S 700BA	2	700	145 - 175	0.8 max	1.13	butylene adipate
Poly S 1000BA	2	1,000	100 - 120	1.0 max	1.09	butylene adipate
Poly S 2000BA	2	2,000	52 - 58	0.8 max	1.13	butylene adipate
Poly S 2001BA	2	2,000	52 - 58	0.8 max	1.13	butylene adipate
Poly S 4000BA	2	4,000	26 - 30	0.5 max	1.13	butylene adipate
Poly S 1000EBA	2	1,000	105 - 115	0.6 max	1.17	ethylene/butylene adipate
Poly S 2000EBA	2	2,000	52 - 58	0.9 max	1.17	ethylene/butylene adipate
Poly S 2000EBA2	2	2,000	52 - 58	0.7 max	1.17	ethylene/butylene adipate
Poly S 2000EBA3	2	2,000	52 - 58	0.5 max	1.17	ethylene/butylene adipate
Poly S 800EPA	2	800	135 - 150	0.7 max	1.17	ethylene/propylene adipate
Poly S 2000EPA	2	2,000	52 - 58	0.6 max	1.17	ethylene/propylene adipate
Poly S 3200EPA	2	3,200	33 - 37	0.6 max	1.19	ethylene/propylene adipate
Poly S 2400PA	2	2,400	43 - 49	0.6 max	1.19	propylene adipate
Poly S 500DA	2	500	210 - 235	0.7 max	1.15	diethylene adipate
Poly S 2000DA	2	2,000	52 - 58	1.0 max	1.19	diethylene adipate
Poly S 2300DA	2	2,300	47 - 49	0.5 max	1.19	diethylene adipate
Poly S 2500DA	2	2,500	41 - 47	0.5 max	1.19	diethylene adipate
Poly S 3000DA	2	3,000	34 - 40	1.0 max	1.19	diethylene adipate

Polyester polyols may be used in a variety of ways to enhance polyurethane systems for elastomers, microcellular, integral skin, molded foam, adhesives, coatings, spray elastomers, flexible foams, rigid foams, to yield an endless list of products with a wide range of properties.

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Isocyanates - Aliphatic

ITWC, Inc.	NCO %	Type	Prepolymer Applications
II-37	37.5 - 37.8	isophorone diisocyanate (IPDI)	coatings, cast elastomers, adhesives, sealants
IW-32	31.8	dicyclohexylmethane 4,4' diisocyanate (HMDI)	coatings, cast elastomers, adhesives, sealants
IW-325	31.8	dicyclohexylmethane 4,4' diisocyanate (HMDI)	coatings, cast elastomers, adhesives, sealants

As with any polyurethane product, use of an isocyanate in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product or product combination for each specific application. The above information is provided as a guideline for material selection and is not to be considered as a recommendation. Please contact your sales representative for material selection assistance.

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EXT - 1000 Series

Short Chain Extenders

EXT - 3000 Series

Trifunctional Extenders

ITWC, Inc.	Type		ITWC, Inc.	Type
EXT-1001	ethylene glycol (EG)		EXT-3001	trimethylolpropane
EXT-1002	diethylene glycol (DEG)		EXT-3002	castor oil
EXT-1003	triethylene glycol (TEG)		EXT-3003	glycerine
EXT-1004	aromatic alkyl ether		EXT-3005	glycol blend
EXT-1005	phenolic ether		EXT-3010	glycol blend
EXT-1006	butanediol (BDO)			
EXT-1007	polyether glycol blend			
EXT-1014	liquid aromatic diamine - curative for TDI systems		**EXT-4000 series**	PPG polyol blends
EXT-1015	polyol blend			
EXT-1018	liquid aromatic diamine - curative for TDI systems		**EXT-5000 series**	PTMEG polyol blends
EXT-1027	polyol blend			
EXT-1028	aromatic polyamine curative		**EXT-6000 series**	polyester polyol blends
EXT-1032	glycol blend			
EXT-1034	bio-based propanediol			

ITWC, Inc. offers a wide variety of extenders and blends that may be used as reactants (component B) when combined with isocyanates, diisocyanates, or prepolymers (component A). Whether the process application is for elastomers, microcellular, integral skin, molded foam, adhesives, coatings, spray elastomers, flexible foams or rigid foams, ITWC, Inc. is your resource for urethane solutions. As with any polyurethane product, the use of an extender in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product or product combination for each specific application. For material selection assistance, contact your ITWC, Inc. representative.

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Additives

ITWC, Inc.	Type	Description	Applications
AD 01	Surfactant	low foaming, non-ionic wetting agent	waterborne coatings
AD 02	Adhesion Promoter	metal to urethane adhesion promoter	polyurethanes
AD 03	Plasticizer	aromatic sulfonic ester	polyurethanes
AD 04	Surfactant/Degassing Agent	silicon based	castable urethane products
AD 05	Surfactant/Degassing Agent	silicon based	rigid foam, microcellular shoe soles, integral skin
AD 06	Surfactant/Degassing Agent	silicon based	microcellular shoe soles, integral skin
AD 07	Surfactant/Degassing Agent	high-performance silicon, nonhydrolyzable	water-blown systems, 141b systems
AD 08	Plasticizer	vegetable oil based	polyurethanes
AD 09	Plasticizer	dioctyl terephthalate	polyurethanes
AD 10	Plasticizer	trimethyl pentandiol diisobutyrate	polyurethanes
AD 11	Polar Solvent	propylene carbonate	polyurethanes
AD 12	Surfactant/Degassing Agent	polysiloxane based	defoaming agent for urethanes
AD 13	Urethane Cleaner	dibasic ester	polyurethanes
AD 14	Moisture Scavenger	molecular sieve	coatings, moisture-cure systems, urethanes
AD 17	Plasticizer	AD 24 Epoxy Resin	AD 31 Fire Retardant
AD 19	Light Stabilizer	AD 26 Light & Oxygen Stabilizer	AD 32 Diluent
AD 21	Plasticizer	AD 28 Acidifier / Stabilizer	AD 33 Enhancer
AD 22	Optical Brightener	AD 30 Light Stabilizer	AD 37 Moisture Scavenger

ITWC Additives are problem solvers used in a variety of ways to complement polyurethane systems. Generally used in small quantities, additives can improve processability, surface finish, cell structure and features of the finished urethane product.
As with any polyurethane product, use of an additive in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product or product combination for each specific application. The above information is provided as a guideline for material selection and is not to be considered as a recommendation. Please contact your sales representative for material selection assistance.

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Catalysts

ITWC, Inc.	Type	Description	Applications
KA 1	Amine	gelling and blowing catalyst, easy handling	all types of polyurethane foams and elastomers
KA 2	Amine	gelling catalyst, delayed easy handling	all types of polyurethane foams and elastomers
KA 4	Amine	gelling catalyst	adhesives, coatings and sealants
KA 5	basic tertiary amine	gelling catalyst, excellent stability	wide range of polyurethane products
KA 6	balanced tertiary amine	stability, low odor, balanced catalysis	semi-flexible foams, rigid foams
KA 7	isocyanate reactive amine	balanced catalysis, surface cure	flexible molded, semi-flexible, rigid foams
KA 20	tertiary amine	stability, low odor, balanced catalysis	wide range of polyurethane products
KM 1	stannous-type organotin	uniform activity	elastomers, one-shot polyether foams, flexible slabstock
KM 2	organotin	rapid gel & tack-free times	elastomers, integral skin, microcellular, coatings, adhesives
KM 3	organotin	stability, increased property performance	spray elastomers, flexible molded, shoe soles
KM 4	dimethylbis[(1-oxoneodecyl)oxy]stannane	gelling catalyst	coatings, adhesives, sealants, elastomers, microcellular
KM 5	di-n-octyltin bi(isooctyl mercaptoacetate)	gelling catalyst	coatings, adhesives, sealants, elastomers, microcellular
KM 6	organomercurial	longer open time, fast gellation, short demold	elastomers, coatings, crystal clear molded products
KM 7	organomercurial	longer open time, fast gellation, short demold	elastomers, coatings
KM 8	organobismuth	reduced toxicity	elastomer systems
KM 9	bismuth-ethyl mix	reduced toxicity	mercury-like reactivity with elastomers
KM 11	organometallic	reduced toxicity	low temperature elastomer systems
KM14	organo bismuth	reduced toxicity	mercury-like reactivity with elastomers
KC 1	KA1 with KM2	amine with organotin added	coatings, adhesives, sealants, elastomers
KC 5	KM8 and KM11	Blend of organobismuth and zinc	coatings, adhesives, sealants, elastomers
KC 6	KA1 with KA2	amine blend	coatings, adhesives, sealants, elastomers
KC 7	Hexanedioic Acid	for catalysis in select TDI systems	coatings, adhesives, sealants, elastomers

Controlled catalysis creates the opportunity for a wide range of processing options and finished product possibilities.

As with any polyurethane product, use of catalyst(s) in a given application must be tested (including field testing) in advance by the user to determine suitability of the selected product or product combination for each specific application. The above information is provided as a guideline for material selection and is not to be considered as a recommendation. Please contact your sales representative for material selection assistance.

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