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WANHUA CHEMICAL
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Cast Polyurethane Elastomer Products

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Innovation Creates Excellence

Wanhua Chemical

To become an innovative, world-class chemical company,
admired by our employees and respected by the community.

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Innovation Creates Excellence

About Us

Wanhua Chemical Group Co.,Ltd. is among the global leading suppliers of chemical innovative products. Relying on the continuous innovation, commercialized facilities and efficient operation, the company provides customers with more competitive products and solutions.

Wanhua Chemical has always been adhering to innovation and optimizing industrial structure. Our business covers polyurethanes, petrochemicals, performance chemicals, and emerging materials. The industries include homeware and furniture, sports and leisure, automobiles and transportation, building and construction, electronics and electrical appliances, personal care, and green energy.

Wanhua Chemical has built up six key production complexes in Yantai, Ningbo, Fujian, Sichuan, and Zhuhai in China, and Hungary, which are integrated with complete supporting facilities. To provide our customers worldwide with competitive products and comprehensive solutions, Wanhua has established R&D centers in Yantai, Ningbo, and Beijing in China, as well as in North America and Europe, set up subsidiaries and offices in more than ten countries and regions including Europe, the United States, and Japan.

Wanhua Chemical will take "Advancing Chemistry, Transforming Lives" as the first mission, we are committed to providing customers with stable, high-quality, competitive products and efficient services, and to being a responsible supplier and industry leader. We will continue to innovate in the field of chemical new materials, lead the development of the industry, and create a better life for mankind!

Business Scope

Polyurethane

- Isocyanate
- Polyether polyol

Petrochemicals

- Ethylene
- EO
- MEG
- SM
- LLDPE
- HDPE
- PVC
- Propane
- Propylene
- NBL
- NPG
- AA
- GAA
- MA
- BA
- MMA
- PO
- PP
- Butane
- IBT
- BD
- MTBE
- TBA
- IB
- DIBE

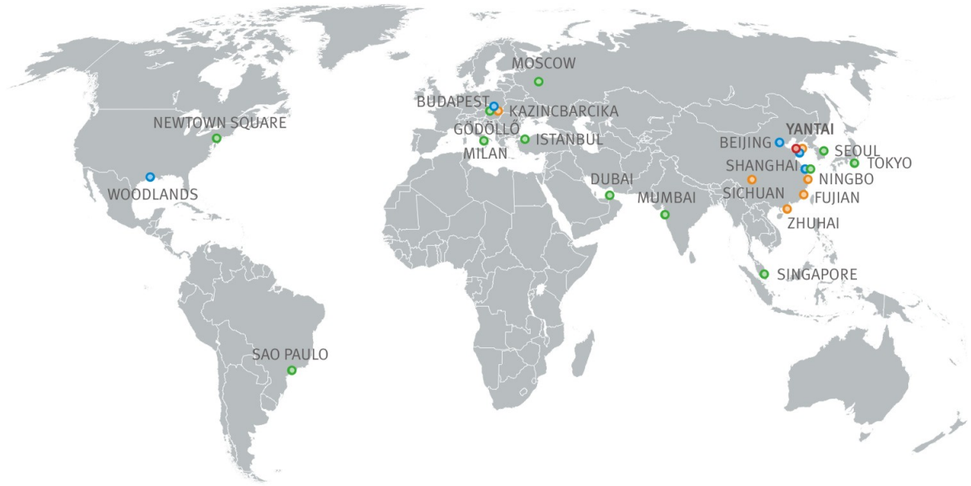
Performance Chemicals

- Silicone
- Rubbers & Plastics
- Water-based Resins
- Home & Personal Care
- EOD
- Membrane Material
- Specialty Amines

Emerging Materials

- Battery Materials
- Electronic Materials
- 3D Printing Materials

Global Network



Headquarters · Production Site · R&D Center · Sales Office

Awards & Honors

2007

The first prize of National Science and Technology Progress

2008

National Environment-friendly Project

2010

The second prize of National Science and Technology Progress

2011

China Grand Awards for Industry-Recognition Award

2012

Top 100 Innovative Companies in China

2015

Shandong Governor Quality Award

2009-2017

Five consecutive sessions Award for Hewitt Best Employers in China

2018

C&EN-Global Top 50

2019

The first Chinese company to join the Together for Sustainability (Tfs) Initiative in 2019

Won PPG's Excellent Supplier Award in 2016 and 2019

2020

Consolidation of Wanhua Chemical (Fujian) Co., Ltd.

The ethylene cracking unit was successfully started up at once, thus all the key units in ethylene industry chain were successfully commissioned

The Wanhua Sichuan site phase i modified plastics project was successfully delivered

MDI Prepolymers

WANNATE® PREPOLYMER	WANNATE® 3T3685M	WANNATE® 3W3688	WANNATE® 3B766A		WANNATE® 3W6685	WANNATE® 3W6690	WANNATE® 3W6695	WANNATE® 3W6698	WANNATE® 3B760A
Features of Product	MDI / ESR				MDI / PTMG				MDI / PCL
Appearance (20℃)	White Solid	White Solid	White Solid		White Solid	White Solid	White Solid	White Solid	White Solid
Viscosity (80℃ / mPa·s)	1800	1600	1400		1300	1100	850	620	800
Preheat Conditions, Hours (℃)	12/80	12/80	12/80		12/60	12/60	12/60	12/60	12/80
Processing Conditions									
Chain Extender	BDO	BDO	BDO		BDO	BDO	BDO	BDO	BDO
BDO Level	6.7	7.1	8.0		6.6	8.2	9.6	12.6	8.1
Prepolymer Temperature (℃)	80	80	80		70	70	70	70	80
BDO Temperature (℃)	40	40	40		40	40	40	40	40
Recommended Mould Temperature (℃)	100	100	100		100	100	100	100	100
Pot Life @ Mix Temperature, Minutes, 400g	10~12	6~8	8~10		10~12	8~10	4~6	1~2	8~10
Post Cure, Hours (℃)	16/100	16/100	16/100		16/100	16/100	16/100	16/100	16/100
Typical Elastomer Physical Properties									
Hardness (20℃, Shore A)	85±2	90±2	92±2		85±2	90±2	95±2	98±2	92±2
Hardness (20℃, Shore D)	—	—	—		—	—	45±2	52±2	—
Tensile Strength (MPa)	40.3	42.8	45.6		29.6	38.8	42.6	56.2	45.8
100% Modulus (MPa)	7.0	9.4	10.6		6.3	10.6	13.4	23.8	10.2
300% Modulus (MPa)	15.2	20.0	22.8		13.2	16.2	22.6	—	21.6
Elongation (%)	680	600	500		580	560	520	260	520
Tear Strength (Die C, KN / m)	82	96	110		72	86	112	136	106
Bashore Rebound (%)	45	44	52		68	66	58	60	58
DIN Abrasion Resistance (mm^3)	28	42	40		36	45	48	56	36

The information presented here is based on laboratory testing.

Rigid Application

WANNATE® 3H830D + WANELAST® 87X

- Two component polyurethane system
- Low viscosity
- Rigid, machinable, engineering elastomer
- Keep from heat and protect against moisture

NATURE OF COMPONENTS		
Prepolymer nature	Nature of chain extender and other components	
MDI - PPG	Ether formulated polyol	Ether formulated polyol

CHARACTERISTICS OF COMPONENTS	Unit	WANNATE® 3H830D	WANELAST® 879	WANELAST® 875
%NCO	%	25.6±0.2	–	–
Physcial appearance at 25℃	–	Liquid	Liquid	Liquid
Viscosity at 25℃	cps	150	350	500

STORAGE AND USE PRECAUTIONS	Unit	WANNATE® 3H830D	WANELAST® 879	WANELAST® 875
Optimal storage temperature of the drums	℃	25	<30	<30
Storage time (sealed drum)	Month	6	12	12

STORAGE AND USE PRECAUTIONS	Unit	WANNATE® 3H830D	WANELAST® 879	WANELAST® 875
Homogenization before processing required	–	no	yes	yes
Degassing required	–	yes	yes	yes

PROCESSING		
Prepolymer	WANNATE® 3H830D	WANNATE® 3H830D
Chain extender	WANELAST® 879	WANELAST® 879
Hardness	83D	87D
Parts by weight of prepolymer	100	100
Parts by weight of Chain extender	97	65

MOLDING AND CURING			
Mold temperature	℃	100-120*	
Pot life (100g mixture at 23℃)	min	25	10
Pot life (100g mixture in heated mold)	-	2'05"	2'35"
Demolding time	min	30	30
Post-curing	h/℃	14/100	

Depending on the oven design, and on size and nature of the mold, the mold temperature can vary. For more information, please contact Sales Department.

PROCESSING				
Prepolymer	–	–	WANNATE® 3H830D	WANNATE® 3H830D
Chain extender	–	–	WANELAST® 879	WANELAST® 875
Hardness at 23℃	DIN 53505	Shore	83D	87D
Hardness at -5℃	DIN 53505	Shore	85D	89D
Hardness at 80℃	DIN 53505	Shore	75D	83D
Tensile Modulus	ISO 527 50mm/min	MPa	1800-2000	2700-2900
Tensile strength	ISO 527 50mm/min	MPa	51	79
Elongation at break	ISO 527 50mm/min	%	20-30	8-10
Impact strength, notched Izod at 20°C	ASTM.D256	KJ/m^2	8.2	11.9
Impact strength, notched Izod at 0°C	ASTM.D256	KJ/m^2	7.3	9.5
Specific gravity		g/mm^3	1.17	1.19

A one week aging at room temperature is required to obtain the optimal properties of the elastomer

MDI 3C System

WANNATE® 3W3616T + WANOL® F2001 + WANALYST® KC332 (Catalyst BL01)

NATURE OF COMPONENTS

Prepolymer nature	Nature of chain extender and other components	
MDI - Ester	WANOL® F2001	Ester formulated polyol
	WANALYST® KC332	Alcohol chain extender

CHARACTERISTICS OF COMPONENTS

	Unit	WANNATE® 3W3616T	WANOL® F2001	WANALYST® KC332
%NCO	%	16.20±0.2	–	–
Physcial appearance at 25℃	–	Liquid	Solid	Liquid
Viscosity at processing temperature	cps	700	650	30

STORAGE AND USE PRECAUTIONS

	Unit	WANNATE® 3W3616T	WANOL® F2001	WANALYST® KC332
Optimal storage temperature of the drums	℃	25	<30	<30
Storage time (sealed drum)	Month	6	12	12

PREPARATION BEFORE PROCESSING

	Unit	WANNATE® 3W3616T	WANOL® F2001	WANALYST® KC332
Preheating temperature (20KG)	℃	50	95	50
Preheating time (20KG)	h	6-8	12-14	6-8
Processing temperature	℃	50	70	25

Keep from heat and protect against moisture
According to physical appearances of components in heated condition, prolonging time of components being heated appropriately, especially in case of 200KG

PROCESSING

Prepolymer	WANNATE® 3W3616T								
Chain extender	WANOL® F2001 + WANALYST® KC332								
Hardness	60A	65A	70A	75A	80A	85A	90A	95A	55D
Parts by weight of WANNATE® 3W3616T	100	100	100	100	100	100	100	100	100
Parts by weight of WANOL® F2001	191.43	172.0	148.78	126.66	113.04	82.00	60.60	47.68	24.69
Parts by weight of WANALYST® KC332	8.30	9.10	10.13	11.07	12.57	12.97	13.89	14.57	15.43
Catalyst BL01 % / total (by weight)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

MOLDING AND CURING

Mold temperature	℃	105								
Pot life (100g mixture in heated mold)	min	4'40"	4'30	4'10	3'55	3'45"	3'30"	3'20"	3'05"	2'45"
Demolding time	min	30'	30'	30'	30'	30'	30'	30'	30'	30'
Post-curing	h/℃	30/90								

Possibility to shorten or lengthen the pot life by increasing or decreasing the catalyst quantity
The catalyst is avoided being heated to high temperature and exposed under the sun long time

ELASTOMER OPTIMAL PROPERTIES (DATA GIVEN AS AN INDICATION)

Prepolymer	WANNATE® 3W3616T										
Chain extender	WANOL® F2001 + WANALYST® KC332										
Hardness at 23℃	DIN 53505	Shore	60	65	70	75	80	85	90	95	55D
Hardness at -5℃	DIN 53505	Shore	64	68	73	78	84	87	93	98	60D
Hardness at 80℃	DIN 53505	Shore	59	58	65	70	76	81	86	91	52D
10% Modulus	ISO 527	MPa	0.6	0.7	1.0	1.1	2.0	2.7	3.1	4.8	8.0
100% Modulus	ISO 527	MPa	2.3	2.9	3.5	4.4	5.7	7.0	7.6	10.3	16.1
200% Modulus	ISO 527	MPa	3.0	4.3	5.6	6.6	7.9	10.5	11.8	15.2	20.7
300% Modulus	ISO 527	MPa	4.4	5.8	8.0	8.5	10.8	12.8	14.7	17.2	28.4
Tensile strength	ISO 527	MPa	30	43	45	49	50	52	47	45	45
Elongation at break	ISO 527	%	640	620	603	560	550	545	545	540	460
Tear strength: without nick	ISO 34-1	kN/m	45	52	68	84	91	100	105	119	138
Resilience	DIN 53512	%	62	62	57	54	52	50	45	43	43
Abrasion loss	ISO 4649	mm^3	23	23	25	28	28	30	32	32	38
Compression set (22h/70℃)	ISO 815-1	%	60	51	44	40	35	31	25	27	25
Specific gravity		g/mm^3	1.21	1.21	1.21	1.21	1.22	1.23	1.23	1.23	1.23

Depending on process conditions, curing and post curing temperature, hardness may vary with a derivation of ± 3 Shore A
A one week aging at room temperature is required to obtain the optimal properties of the elastomer

Introduction

WANNATE® 3W3616T is a non-mercury catalyzed, polyester polyol based system that offer significant advantages to the casting PU processor. With the use of those three material components: WANNATE® 3W3616T, WANOL® F2001 and WANALYST® KC332, the following advantages are gained:

- A wide range of hardness levels from just three components
- Non-use MOCA curatives
- Low processing temperatures-low energy costs
- Wide variety of technical properties are achievable
- High tear strength and abrasion resistance
- Good resistance to solvent, oils.....

MDI 3C System

WANNATE® 3W6698 + WANOL® F2002 + WANALYST® KC332 (Catalyst BL01)

NATURE OF COMPONENTS

Prepolymer nature	Nature of chain extender and other components	
MDI - Ester	WANOL® F2002	Ester formulated polyol
	WANALYST® KC332	Alcohol chain extender

CHARACTERISTICS OF COMPONENTS

	Unit	WANNATE® 3W6698	WANOL® F2002	WANALYST® KC332
%NCO	%	12.5±0.2	–	–
Physcial appearance at 25℃	–	Solid	Solid	Liquid
Viscosity at processing temperature	cps	1300	1200	30

STORAGE AND USE PRECAUTIONS

	Unit	WANNATE® 3W6698	WANOL® F2002	WANALYST® KC332
Optimal storage temperature of the drums	℃	25	<30	<30
Storage time (sealed drum)	Month	6	12	12

PREPARATION BEFORE PROCESSING

	Unit	WANNATE® 3W6698	WANOL® F2002	WANALYST® KC332
Preheating temperature (20KG)	℃	50	70	50
Preheating time (20KG)	h	6-8	12-14	6-8
Processing temperature	℃	45	55	25

Keep from heat and protect against moisture

According to physical appearances of components in heated condition, prolonging time of components being heated appropriately, especially in case of 200KG

PROCESSING

Prepolymer	WANNATE® 3W6698							
Chain extender	WANOL® F2002 + WANALYST® KC332							
Hardness	60A	65A	70A	75A	80A	85A	90A	95A
Parts by weight of WANNATE® 3W6698	100	100	100	100	100	100	100	100
Parts by weight of WANOL® F2002	138.57	122.66	111.39	98.80	75.79	54.63	36.88	20.14
Parts by weight of WANALYST® KC332	6.79	7.48	7.96	8.50	9.48	10.38	11.15	11.86
Catalyst BL01 % / total (by weight)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

MOLDING AND CURING

Mold temperature	℃	100							
Pot life (100g mixture in heated mold)	min	4'40"	4'30	4'10	3'55	3'45"	3'30"	3'20"	3'05"
Demolding time	min	30'	30'	30'	30'	30'	30'	30'	30'
Post-curing	h/℃	18/100							

Possibility to shorten or lengthen the pot life by increasing or decreasing the catalyst quantity

The catalyst is avoided being heated to high temperature and exposed under the sun long time

ELASTOMER OPTIMAL PROPERTIES (DATA GIVEN AS AN INDICATION)

Prepolymer	WANNATE® 3W6698									
Chain extender	WANOL® F2002 + WANALYST® KC332									
Hardness at 23℃	DIN 53505	Shore	60	65	70	75	80	85	90	95
Hardness at -5℃	DIN 53505	Shore	64	68	73	78	84	87	93	98
Hardness at 80℃	DIN 53505	Shore	59	64	65	70	76	81	86	91
10% Modulus	ISO 527	MPa	0.8	1.1	1.1	1.5	2.0	2.7	3.1	5.5
100% Modulus	ISO 527	MPa	2.3	2.9	3.5	4.4	5.7	7.0	9.6	13.1
200% Modulus	ISO 527	MPa	3.0	4.3	5.6	6.6	7.9	10.5	11.8	15.2
300% Modulus	ISO 527	MPa	4.8	6.4	8.7	11	12.3	15.4	17.9	23
Tensile strength	ISO 527	MPa	25	26	30	33	38	39	47	45
Elongation at break	ISO 527	%	640	620	603	560	550	545	545	540
Tear strength: without nick	ISO 34-1	kN/m	45	52	68	84	91	100	105	126
Resilience	DIN 53512	%	77	75	75	75	71	68	65	61
Abrasion loss	ISO 4649	mm^3	23	23	25	28	28	30	32	32
Compression set (22h/70℃)	ISO 815-1	%	22	22	13	12	11	17	19	20
Specific gravity		g/mm^3	1.04	1.05	1.05	1.05	1.06	1.08	1.12	1.12

Depending on process conditions, curing and post curing temperature, hardness may vary with a derivation of ± 3 Shore A

A one week aging at room temperature is required to obtain the optimal properties of the elastomer

Introduction

WANNATE® 3W6698 is a non-mercury catalyzed, PTMG polyol based system that offer significant advantages to the casting PU processor. With the use of those three material components: WANNATE® 3W6698, WANOL® F2002 and WANALYST® KC332, the following advantages are gained:

- A wide range of hardness levels from just three components
- Non-use MOCA curatives
- Low processing temperatures-low energy costs
- Wide variety of technical properties are achievable
- Superior resilience and abrasion resistance
- Good resistance to water