

HPU gecco

Hydrolysis-resistant Polyurethane

Standard colour: green, similar to RAL 6016

- HPU for standard applications
- Resistant to mineral oils, HFD-U and HETG-fluids, sour oils and gases, cold water as well as diluted acids and bases
- Applicable for static seals, rod and piston seals, wiper seals and rotary seals

Properties	Value	Unit	DIN Standard
Hardness	94 ±3	Shore A	DIN ISO 7619-1
Hardness	49 ±3	Shore D	DIN ISO 7619-1
Density	1,194	g/cm ³	DIN EN ISO 1183-1
100% Modulus	10,9	MPa	DIN 53504
300% Modulus	20,6	MPa	DIN 53504
Elongation at break	460	%	DIN 53504
Tensile strength	36,0	MPa	DIN 53504
Compression set 70°C/22h	23	%	DIN ISO 815-1
Compression set 70°C/70h	27	%	DIN ISO 815-1
Compression set 100°C/22h	40	%	DIN ISO 815-1
Rebound resilience	36	%	DIN ISO 4662:2017
Tear resistance	39,2	N/mm	DIN ISO 34-1 A
Abrasion resistance	26	mm ³	DIN ISO 4649 B
min. Service temperature	-30	°C	
max. Service temperature	+110	°C	

All above stated data result from random tests which were taken from the ongoing production. All data were established based on standard test-specimen according to ISO, DIN and ASTM standards and can basically not be carried over to the construction element.

Our applied technical advice, either oral, written or through tests is given according to our best knowledge. However, this information is to be considered as non-obligatory instruction, also in terms of any protective rights of a third party, and does not exempt you from testing our product in reference to its suitability for the intended process and purpose. Utilisation, application and processing of the products occur entirely outside of our control and are therefore exclusively your responsibility. However, should a case of liability come into question, it will be limited to all damages in the value of the product which we delivered and you used. By all means, we do warrant the impeccable quality of our products in accordance with our general sales and delivery conditions

HPU Lubric

Hydrolysis-resistant Polyurethane, modified by lubricants

Standard colour: black

- HPU with lowered coefficient of friction
- Resistant to mineral oils, HFD-U and HETG-fluids, sour oils and gases, cold water as well as diluted acids and bases
- Applicable for static seals, rod and piston seals, wiper seals and rotary seals, backup rings

Properties	Value	Unit	DIN Standard
Hardness	94 ±5	Shore A	DIN ISO 7619-1
Hardness	49 ±3	Shore D	DIN ISO 7619-1
Density	1,195	g/cm ³	DIN EN ISO 1183-1
100% Modulus	11,8	MPa	DIN 53504
300% Modulus	22,8	MPa	DIN 53504
Elongation at break	464	%	DIN 53504
Tensile strength	40,9	MPa	DIN 53504
Compression set 70°C/22h	17	%	DIN ISO 815-1
Compression set 70°C/70h	30	%	DIN ISO 815-1
Compression set 100°C/22h	31	%	DIN ISO 815-1
Rebound resilience	32	%	DIN ISO 4662:2017
Tear resistance	94,0	N/mm	DIN ISO 34-1 A
Abrasion resistance	29	mm ³	DIN ISO 4649 B
min. Service temperature	-30	°C	
max. Service temperature	+110	°C	

All above stated data result from random tests which were taken from the ongoing production. All data were established based on standard test-specimen according to ISO, DIN and ASTM standards and can basically not be carried over to the construction element.

Our applied technical advice, either oral, written or through tests is given according to our best knowledge. However, this information is to be considered as non-obligatory instruction, also in terms of any protective rights of a third party, and does not exempt you from testing our product in reference to its suitability for the intended process and purpose. Utilisation, application and processing of the products occur entirely outside of our control and are therefore exclusively your responsibility. However, should a case of liability come into question, it will be limited to all damages in the value of the product which we delivered and you used. By all means, we do warrant the impeccable quality of our products in accordance with our general sales and delivery conditions.

HPU mellow

Hydrolysis-resistant Polyurethane

Standard colour: whitegreen, similar to RAL 6019

- HPU in softer setting, even though excellent machinable
- Resistant to mineral oils, HFD-U and HETG-fluids, sour oils and gases, cold water as well as diluted acids and bases
- Applicable for static seals, rod and piston seals, wiper seals and rotary seals

Properties	Value	Unit	DIN Standard
Hardness	86 ±3	Shore A	DIN ISO 7619-1
Density	1,188	g/cm ³	DIN EN ISO 1183-1
100% Modulus	6,5	MPa	DIN 53504
300% Modulus	33,3	MPa	DIN 53504
Elongation at break	355	%	DIN 53504
Tensile strength	44,2	MPa	DIN 53504
Compression set 23°C/70h	18	%	DIN ISO 815-1
Compression set 70°C/22h	17	%	DIN ISO 815-1
Compression set 70°C/70h	21	%	DIN ISO 815-1
Compressive modulus	15,1	MPa	Acc. Studer/Kunz
Rebound resilience	41	%	DIN ISO 4662:2017
Tear resistance	69	N/mm	DIN ISO 34-1 A
Abrasion resistance	51	mm ³	DIN ISO 4649 B
min. Service temperature	-30	°C	
max. Service temperature	+95	°C	

All above stated data result from random tests which were taken from the ongoing production. All data were established based on standard test-specimen according to ISO, DIN and ASTM standards and can basically not be carried over to the construction element.

Our applied technical advice, either oral, written or through tests is given according to our best knowledge. However, this information is to be considered as non-obligatory instruction, also in terms of any protective rights of a third party, and does not exempt you from testing our product in reference to its suitability for the intended process and purpose. Utilisation, application and processing of the products occur entirely outside of our control and are therefore exclusively your responsibility. However, should a case of liability come into question, it will be limited to all damages in the value of the product which we delivered and you used. By all means, we do warrant the impeccable quality of our products in accordance with our general sales and delivery conditions.

HPU premium

Hydrolysis-resistant Polyurethane, suitable for foodstuff

Standard colour: red, similar to RAL 3020

- HPU with approval according FDA
- Resistant to mineral oils, HFD-U and HETG-fluids, sour oils and gases, cold water as well as diluted acids and bases
- Applicable for static seals, rod and piston seals, wiper seals and rotary seals

Properties	Value	Unit	DIN Standard
Hardness	95 ± 3	Shore A	DIN ISO 7619-1
Hardness	49 ± 3	Shore D	DIN ISO 7619-1
Density	1,190	g/cm ³	DIN EN ISO 1183-1
100% Modulus	15,3	MPa	DIN 53504
300% Modulus	44,5	MPa	DIN 53504
Elongation at break	382	%	DIN 53504
Tensile strength	49,2	MPa	DIN 53504
Compression set 70°C/22h	20,0	%	DIN ISO 815-1
Compression set 70°C/70h	22,5	%	DIN ISO 815-1
Compression set 100°C/22h	27,9	%	DIN ISO 815-1
Rebound resilience	39	%	DIN ISO 4662:2017
Tear resistance	40,1	N/mm	DIN ISO 34-1 A
Abrasion resistance	28	mm ³	DIN ISO 4649 B
min. Service temperature	- 30	°C	
max. Service temperature	+110	°C	

Confirmation according FDA

Hereby we, Trygonal, Kunststoffinnovationen GmbH, confirm, that all single components used for our compound named «HPU premium» are listed on Code of Federal Regulation of U.S. Food and Drug Administration (FDA), Rockville MD. They are mentioned under following subchapters: **21CFR 177.1680.**

Allowed for contact with foods. Not permitted for medical articles (implants)!

We explicitly point out that the user himself has to undertake tests, which will reassure the adequacy of the material mentioned above for the use in pharmaceutical and medical applications.

All above stated data result from random tests which were taken from the ongoing production. All data were established based on standard test-specimen according to ISO, DIN and ASTM standards and can basically not be carried over to the construction element.

Our applied technical advice, either oral, written or through tests is given according to our best knowledge. However, this information is to be considered as non-obligatory instruction, also in terms of any protective rights of a third party, and does not exempt you from testing our product in reference to its suitability for the intended process and purpose. Utilisation, application and processing of the products occur entirely outside of our control and are therefore exclusively your responsibility. However, should a case of liability come into question, it will be limited to all damages in the value of the product which we delivered and you used. By all means, we do warrant the impeccable quality of our products in accordance with our general sales and delivery conditions.

HPU taiga

Hydrolysis-resistant Polyurethane

Standard colour: nightblue, similar to RAL 5022

- HPU for low temperature applications
- Resistant to mineral oils, HETG-fluids, diluted acids and bases
- Applicable for static seals, rod and piston seals, wiper seals and rotary seals

Properties	Value	Unit	DIN Standard
Hardness	94 ±3	Shore A	DIN ISO 7619-1
Hardness	47 ±3	Shore D	DIN ISO 7619-1
Density	1,162	g/cm ³	DIN EN ISO 1183-1
100% Modulus	9,2	MPa	DIN 53504
300% Modulus	12,3	MPa	DIN 53504
Elongation at break	525	%	DIN 53504
Tensile strength	23,5	MPa	DIN 53504
Compression set 70°C/22h	26	%	DIN ISO 815-1
Compression set 70°C/70h	38	%	DIN ISO 815-1
Compression set 100°C/22h	21	%	DIN ISO 815-1
Rebound resilience	45	%	DIN ISO 4662:2017
Tear resistance	91	N/mm	DIN ISO 34-1 A
Abrasion resistance	75	mm ³	DIN ISO 4649 B
min. Service temperature	-50	°C	
max. Service temperature	+115	°C	

All above stated data result from random tests which were taken from the ongoing production. All data were established based on standard test-specimen according to ISO, DIN and ASTM standards and can basically not be carried over to the construction element.

Our applied technical advice, either oral, written or through tests is given according to our best knowledge. However, this information is to be considered as non-obligatory instruction, also in terms of any protective rights of a third party, and does not exempt you from testing our product in reference to its suitability for the intended process and purpose. Utilisation, application and processing of the products occur entirely outside of our control and are therefore exclusively your responsibility. However, should a case of liability come into question, it will be limited to all damages in the value of the product which we delivered and you used. By all means, we do warrant the impeccable quality of our products in accordance with our general sales and delivery conditions

XHPU diet lubric

Hydrolysis-resistant polyurethane, modified by lubricants, suitable for foodstuff, standard colour: black

- HPU diet in harder setting, decreased lowered coefficient of friction, approval according FDA as well as according EU1935/2004
- Resistant to mineral oil, HFD-U, HETG fluids, acid oils and gases, cold water, diluted acids and bases
- Applicable for rod and piston seals, wiper seals, rotary seals, static seals, spring-loaded sealing elements, backup rings and guide rings

Properties	Value	Unit	DIN Standard
Hardness	58 ± 3	Shore D	DIN ISO 7619-1
Density	1,21	g/cm ³	DIN EN ISO 1183-1
100% Modulus	19,3	MPa	DIN 53504
300% Modulus	38,0	MPa	DIN 53504
Elongation at break	364	%	DIN 53504
Tensile strength	42,5	MPa	DIN 53504
Compression set 70°C/22h	4	%	DIN ISO 815-1
Compression set 70°C/70h	18	%	DIN ISO 815-1
Compression set 100°C/22h	10	%	DIN ISO 815-1
Rebound resilience	21	%	DIN ISO 4662:2017
Tear strength	96,0	N/mm	DIN ISO 34-1 A
Abrasion	10,0	mm ³	DIN ISO 4649 B
min. Service temperature	- 30	°C	
max. Service temperature	+110	°C	

Confirmation according FDA

Hereby we, Trygonal, Kunststoffinnovationen GmbH, confirm, that all single components used for our compound named «XHPU diet lubric» are listed on Code of Federal Regulation of U.S. Food and Drug Administration (FDA), Rockville MD. They are mentioned under following subchapters: **21CFR 177.1680**.

Confirmation according EU1935/2004

The confirmation according FDA mentioned above provides an approval according EU1935/2004. Due to unavoidable technical factors or due to the form of delivery of the elastomeric pre-materials traces of non-specified impurities could be included. A compulsory test should be applied to the final product.

Allowed for contact with foods. Not permitted for medical articles (implants)!

We explicitly point out that the user himself has to undertake tests, which will reassure the adequacy of the material mentioned above for the use in pharmaceutical and medical applications.

All above stated data result from random tests which were taken from the ongoing production. All data were established based on standard test-specimen according to ISO, DIN and ASTM standards and can basically not be carried over to the construction element.

Our applied technical advice, either oral, written or through tests is given according to our best knowledge. However, this information is to be considered as non-obligatory instruction, also in terms of any protective rights of a third party, and does not exempt you from testing our product in reference to its suitability for the intended process and purpose. Utilisation, application and processing of the products occur entirely outside of our control and are therefore exclusively your responsibility. However, should a case of liability come into question, it will be limited to all damages in the value of the product which we delivered and you used. By all means, we do warrant the impeccable quality of our products in accordance with our general sales and delivery conditions

X-HPU Lubric

Hydrolysis-resistant polyurethane, modified by lubricants

Standard colour: black

- HPU in harder setting, with lowered coefficient of friction
- Resistant to mineral oil, HFD-U, HETG fluids, acid oils and gases, cold water, diluted acids and bases
- Applicable for rod and piston seals, wiper seals, rotary seals, static seals, spring-loaded sealing elements, backup rings and guide rings

Properties	Value	Unit	DIN Standard
Hardness	58 ± 3	Shore D	DIN ISO 7619-1
Density	1,21	g/cm ³	DIN EN ISO 1183-1
100% Modulus	19,3	MPa	DIN 53504
300% Modulus	38,0	MPa	DIN 53504
Elongation at break	364	%	DIN 53504
Tensile strength	42,5	MPa	DIN 53504
Compression set 70°C/22h	4	%	DIN ISO 815-1
Compression set 70°C/70h	18	%	DIN ISO 815-1
Compression set 100°C/22h	10	%	DIN ISO 815-1
Rebound resilience	21	%	DIN ISO 4662:2017
Tear strength	96,0	N/mm	DIN ISO 34-1 A
Abrasion	10,0	mm ³	DIN ISO 4649 B
min. Service temperature	- 30	°C	
max. Service temperature	+110	°C	

All above stated data result from random tests which were taken from the ongoing production. All data were established based on standard test-specimen according to ISO, DIN and ASTM standards and can basically not be carried over to the construction element.

Our applied technical advice, either oral, written or through tests is given according to our best knowledge. However, this information is to be considered as non-obligatory instruction, also in terms of any protective rights of a third party, and does not exempt you from testing our product in reference to its suitability for the intended process and purpose. Utilisation, application and processing of the products occur entirely outside of our control and are therefore exclusively your responsibility. However, should a case of liability come into question, it will be limited to all damages in the value of the product which we delivered and you used. By all means, we do warrant the impeccable quality of our products in accordance with our general sales and delivery conditions.

X-HPU solid

Hydrolysis-resistant Polyurethane

Standard colour: Rubined, similar to RAL 3003

- HPU in harder setting, to be used as backup rings as well
- Resistant to mineral oils, HFD-U and HETG-fluids, sour oils and gases, cold water as well as diluted acids and bases
- Applicable for static seals, rod and piston seals, wiper seals and rotary seals, as gliding ring with energizer, as backup- and guiding ring as well as in static applications

Properties	Value	Unit	DIN Standard
Hardness	58 ±3	Shore D	DIN ISO 7619-1
Density	1,20	g/cm ³	DIN EN ISO 1183-1
100% Modulus	19,9	MPa	DIN 53504
300% Modulus	40,7	MPa	DIN 53504
Elongation at break	302	%	DIN 53504
Tensile strength	40,7	MPa	DIN 53504
Compression set 70°C/22h	22	%	DIN ISO 815-1
Compression set 70°C/70h	25	%	DIN ISO 815-1
Compression set 100°C/22h	31	%	DIN ISO 815-1
Rebound resilience	18	%	DIN ISO 4662:2017
Tear resistance	97	N/mm	DIN ISO 34-1 A
Abrasion resistance	47	mm ³	DIN ISO 4649 B
min. Service temperature	-30	°C	
max. Service temperature	+110	°C	

All above stated data result from random tests which were taken from the ongoing production. All data were established based on standard test-specimen according to ISO, DIN and ASTM standards and can basically not be carried over to the construction element.

Our applied technical advice, either oral, written or through tests is given according to our best knowledge. However, this information is to be considered as non-obligatory instruction, also in terms of any protective rights of a third party, and does not exempt you from testing our product in reference to its suitability for the intended process and purpose. Utilisation, application and processing of the products occur entirely outside of our control and are therefore exclusively your responsibility. However, should a case of liability come into question, it will be limited to all damages in the value of the product which we delivered and you used. By all means, we do warrant the impeccable quality of our products in accordance with our general sales and delivery conditions