TESTING AND CERTIFICATION OF DIFFERENT MATERIALS

DVGW-CERT
19. Mai 2022
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DVGW | TZW Technologiezentrum Wasser

TEST LAB „PRÜFSTELLE WASSER“

- Accredited test lab according to DIN EN 17025
- Testing according to different standards (e.g. DVGW, UBA, DIN…)
- Working in close cooperation with DVGW Cert GmbH

- Hygienic and microbiological tests on products and materials for the drinking water sector
- Devices for treating drinking water

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PRÜFSTELLE WASSER – mechanical tests

- Typical tests in the field of mechanics
  - Pressure
  - Flow
  - Resistance to torques
  - Endurance tests
  - Protection of drinking water

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PRÜFSTELLE WASSER – UV testing

- Typical tests in the field of UV
  - Biodosimetric testing of the UV disinfection efficacy of UV devices (up to 3,700 m^3/h)
  - Electro-optical characterization of UV sources
  - Characterization of UV sensors and reference radiometers
  - Preparation of dose-response curves for microorganisms and viruses (Hg low pressure, Hg medium pressure and various single wavelengths (LED)
  - Numerical flow simulation and UV intensity models for UV systems

PRÜFSTELLE WASSER – Hygienic tests

- Typical tests in the subject area hygiene of materials
  - Recipe/Formulation (chemical composition)
    - Migration
    - Basic requirements (TOC, color, turbidity, odour)
    - Material and recipe specific requirements
  - Microbiological growth
    - W 270 (new: EN 16421 – method 2)

- Customer receives test report (formerly test certificate)

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TRINKWASSERVERORDNUNG §17

- (3) Specification through binding assessment principles of the Federal Environment Agency (UBA)
- Test specifications with test parameters, test criteria, methodical specifications
  - Positive lists of starting materials
  - Positive lists of substances and materials for which the hygienic suitability for use in drinking water has been proven by tests

→ The evaluation criteria document comes into force two years after its publication in normal case

OVERVIEW UBA-HOMEPAGE

Table of Contents

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UBA-EVALUATION CRITERIA DOCUMENTS

- **Evaluation criteria document for metallic materials** (published 10.04.2015, binding since 10.04.2017)
- **Evaluation criteria document for plastics and other organic materials (KTW-BWGL)** published 21.03.2019, binding since 21.03.2021 for:
  - Plastics
  - Organic coatings
  - lubricants
  - Elastomers and thermoplastic elastomers since this year
- **Evaluation criteria document for enamels and ceramic materials** (published 12.09.2019, binding since 12.09.2021)

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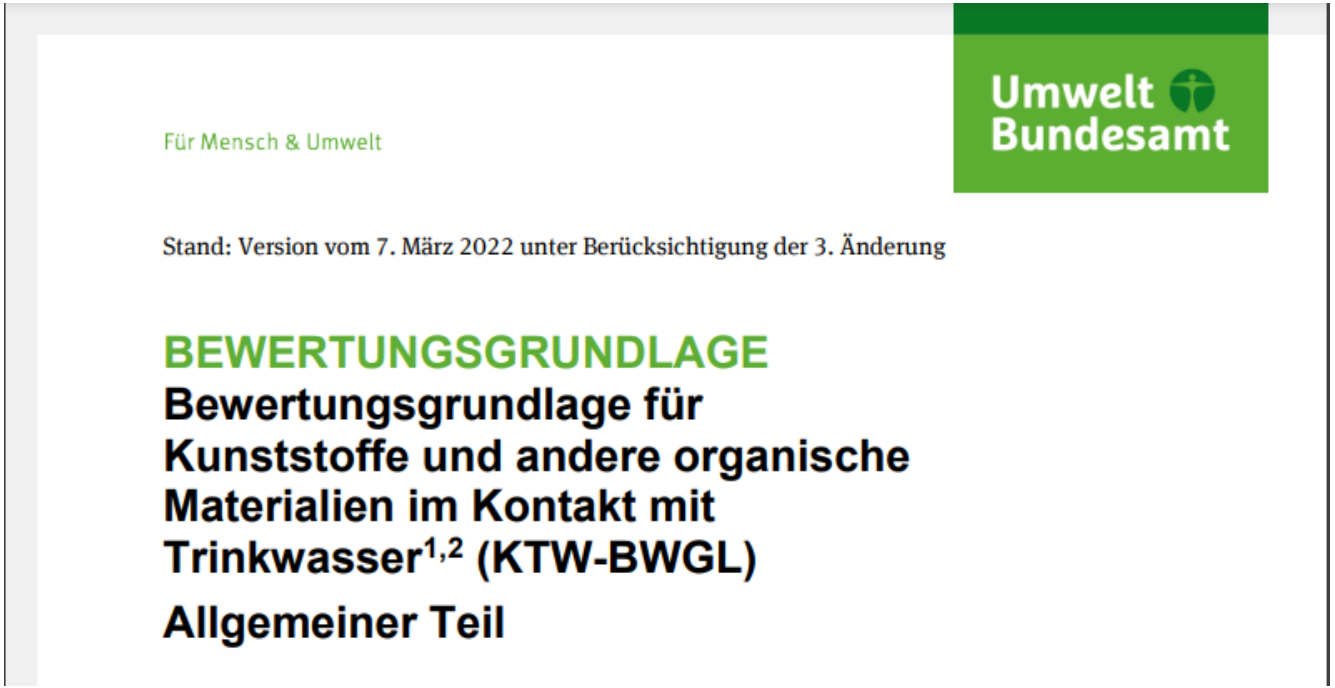
UBA-evaluation criteria documents

KTW-BWGL



Für Mensch & Umwelt

Umwelt Bundesamt

Stand: Version vom 7. März 2022 unter Berücksichtigung der 3. Änderung

BEWERTUNGSGRUNDLAGE

Bewertungsgrundlage für Kunststoffe und andere organische Materialien im Kontakt mit Trinkwasser[1,2] (KTW-BWGL)

Allgemeiner Teil

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UBA-Recommendation for attestation of conformity

Für Mensch & Umwelt

Umwelt Bundesamt

As at: 29 July 2021

RECOMMENDATION

Conformity attestation of product hygiene suitability for drinking water[1]

English translation – only the German document version is legally binding

3rd amendment:

- adaption of definition of terms section
- previous annex 7: integration into main part incl. specifications on conformity attestations for formulations, pre-products and intermediate products (new sections 6.5 and 6.6)
- additional editorial changes

→ Certification programs of the certification bodies (e.g. DVGW-Cert)

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UBA-EVALUATION CRITERIA DOCUMENT

- Scope of testing: KTW-BWGL- **Risk-based**

Tabelle 2: Risikobasierte Anforderungen

Risiko-gruppe	Konversionsfaktor F_C in d/dm (Siehe Tabelle 7: Produktgruppen mit den dazugehörigen Konversionsfaktoren)	Beispiele für Produkte (Siehe Tabelle 8: Zuordnung der Produkte zu den Produktgruppen)	Anforderung an die Zusammen-setzung	Grund-anforderungen	Rezeptur spezifische Einzelstoff-anforderungen	Zusatz-anforderungen	Mikrobiologische Anforderungen (Bei Rohren mit $F_C \leq 10$ d/dm gelten die mikrobio-logischen Anfor-derungen für Prüf-körper aus Rezeptur)
P1	≥ 0,5	Rohre	Ja gilt für Rezeptur	Ja gilt für Produkt/Bauteil	Ja gilt für Produkt/Bauteil	Ja gilt für Produkt/Bauteil	Ja gilt für Produkt/Bauteil
		Ausrüstungsgegen-stände und Behälter	Ja gilt für Rezeptur	Ja gilt für Produkt/Bauteil	Ja gilt für Produkt/Bauteil	Ja gilt für Produkt/Bauteil	Ja gilt für Prüfkörper aus Rezeptur
P2	$0,05 \leq F_C < 0,5$	Bauteile von Ausrüstungsgegen-ständen und Bauteile in Behältern	Ja gilt für Rezeptur	Ja gilt für Prüfkörper der Rezeptur	Ja gilt für Prüfkörper der Rezeptur	Ja gilt für Prüfkörper der Rezeptur	Ja gilt für Prüfkörper der Rezeptur
P3	$0,005 \leq F_C < 0,05$	Kleinflächige Bauteile von Ausrüstungs-gegenständen und kleinflächige Bauteile in Behältern	Nein	Ja gilt für Prüfkörper der Rezeptur	Nein	Nein	Ja gilt für Prüfkörper der Rezeptur
P4	< 0,005		Nein	Nein	Nein	Nein	Nein

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MATERIALS IN CONTACT WITH DRINKING WATER

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MATERIALS IN CONTACT WITH DRINKING WATER

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RECIPE/COMPOSITION CHECK

Requirements on the composition:

- Applicable positive lists in the different appendices
- Disclosure of the recipe with all individual substances by the recipe owner
  - Disclosure of sub-recipes
- Non-Disclosure Agreements
- Application of the 0.02 % rule by the test center – not from the recipe owner
- Time-determining step in the whole process

MIGRATION TEST

- Migration tests:

(in accordance with DIN EN 12873-1)

  - Cold water 23 °C (required)
  - Warm water 60 °C (optional)
  - Hot water 85 °C (optional)

- Test requirements:
  - Basic requirements:
    - **TOC**
    - **Colour and turbidity**
    - **Threshold odour number** (TON)
  - Additional requirements from the material
  - Individual requirements from the recipe

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MIGRATION TEST - TON

- Threshold odour number (TON):

- Determination according to DIN EN 1622:
  - Casual pair test
  - TON-panel with at least 3 test persons
  - Comparison of a reference water with the sample or a dilution of the sample (1/2; 1/4; 1/8; 1/16 ...)
  - At least 66% agreement or 66% of the tester within a geometric mean of one dilution interval

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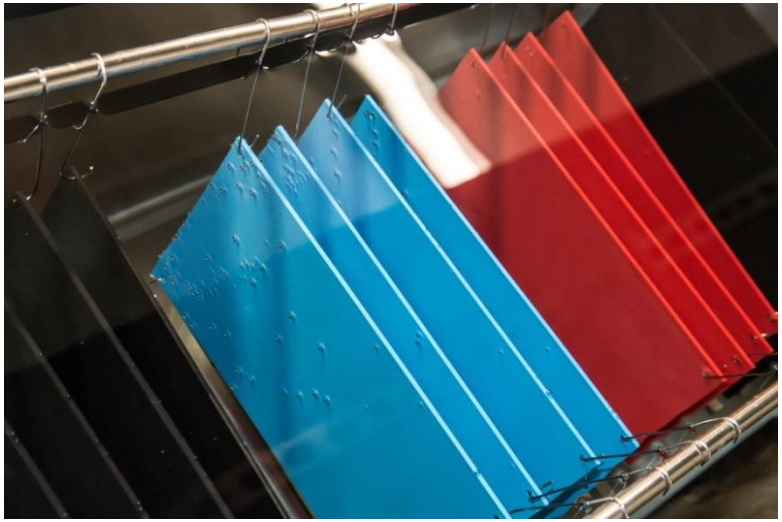
MICROBIOLOGICAL GROWTH(DIN EN 16421)

- Microbiological evaluation of organic materials in the field of drinking water exposure of the test specimens (plates 800 cm²) in basins (approx. 100 L) or pipes with slowly flowing (20 L/h) water



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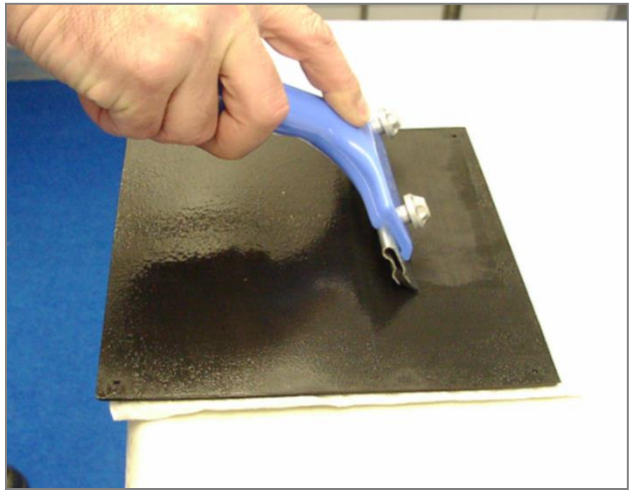
MICROBIOLOGICAL GROWTH(DIN EN 16421)

- Examination of microbiological growth using 1, 2, 3 month samples by scraping and volume measurement in centrifuge tubes
- Test requirements for microbiological assessment integrated in KTW-BWGL, reference to DIN EN 16421 - Procedure 2 (formerly DVGW W 270)



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DVGW CERTIFICATION PROGRAMS

DVGW CERT GMBH	**Certification program Attestation of conformity of drinking water hygiene suitability, procedure 1+ CP 1000**	51000-03-P-GB Doc. type: ZP Drafter: Britz State: 05.10.2021

DVGW CERT GMBH	**Certification program Attestation of conformity of drinking water hygiene suitability based on type testing CP 0800**	50800-03-P-GB Doc. type: ZP Drafter: Britz State: 04.10.2021

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DIFFERENT TYPES OF CERTIFICATION

- ZP 800 / **Type test**
  - Recipe check
  - Migration test
  - Microbiological growth

- ZP 1000 / **1+-System**
  - Recipe check
  - *Initial audit*
  - Migration test
  - Microbiological growth
  - *Annual audit*

- **Legal minimum requirement**
  - Recipe check
  - Migration test
  - Microbiological growth
  - *Self-declaration*

(= declaration of conformity)

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SCOPE OF INSPECTION AT THE PRODUCTION SITE

- Implementation by the certification body or authorized persons (listed at the certification body)

- Storage of raw materials / preliminary products
- Provision / transport of raw materials and preliminary products
- Production processes
- Factory production control (especially for pipe manufacturers)
- Post-treatment
- Packaging and storage

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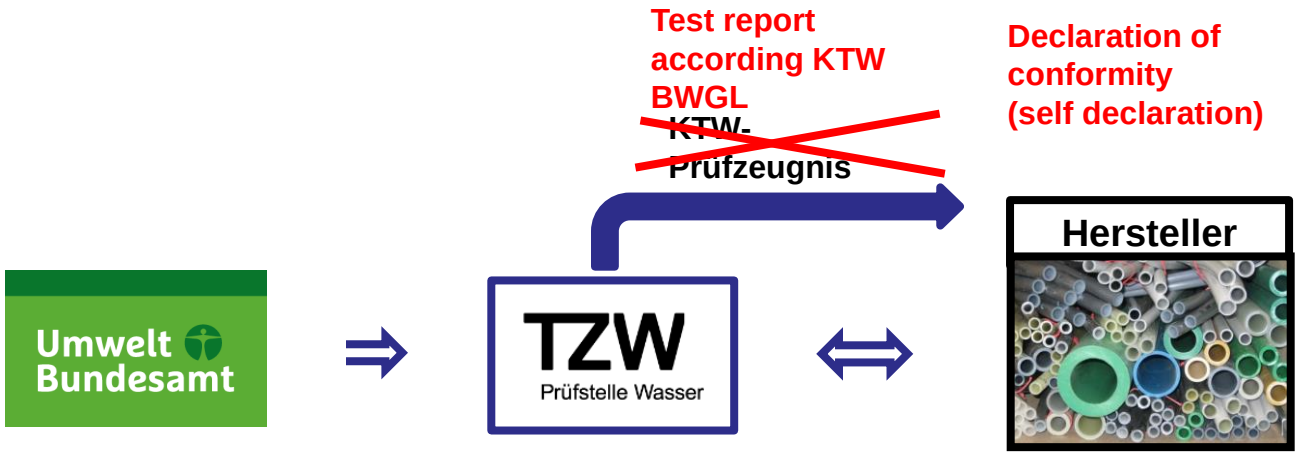
SELF-DECLARATION



UBA-KTW BWGL

- **Exchange of test-relevant information**
- **Coordination of the test specimens**
- **Sending of the test specimens by the manufacturer**

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Attestation of conformity of drinking water hygiene suitability

Zertifizierungsprogramm:
Konformitätsbestätigung
(Hygienezertifikat)

DVGW CERT

Prüf- und Inspek-
tionsberichte

Umwelt Bundesamt

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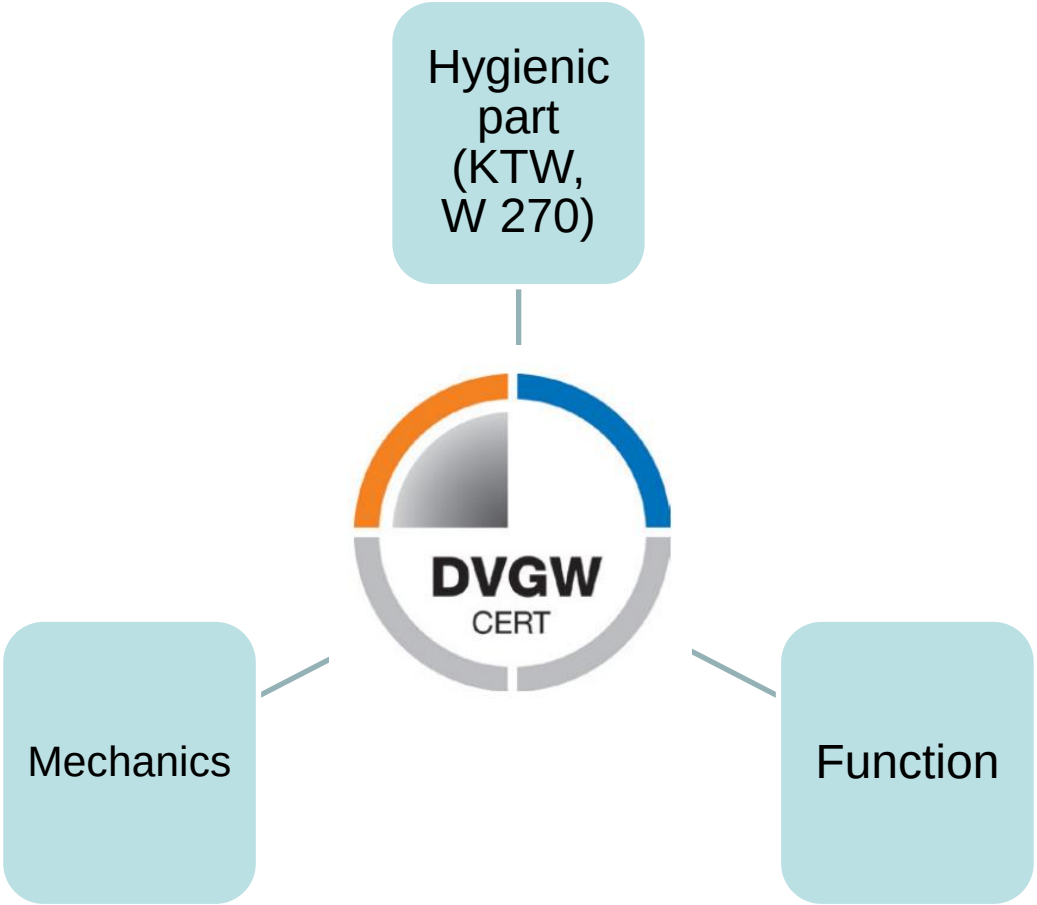
Prüfstelle Wasser

Hersteller

UBA-
- KTW-Bewertungsgrundlage
- Empfehlung Konformitätsb.

Abstimmung hinsichtlich:
- Typprüfung
- Werkseigene Produktionskontrolle
- Fremdüberwachung

CERTIFICATION FOR PRODUCTS



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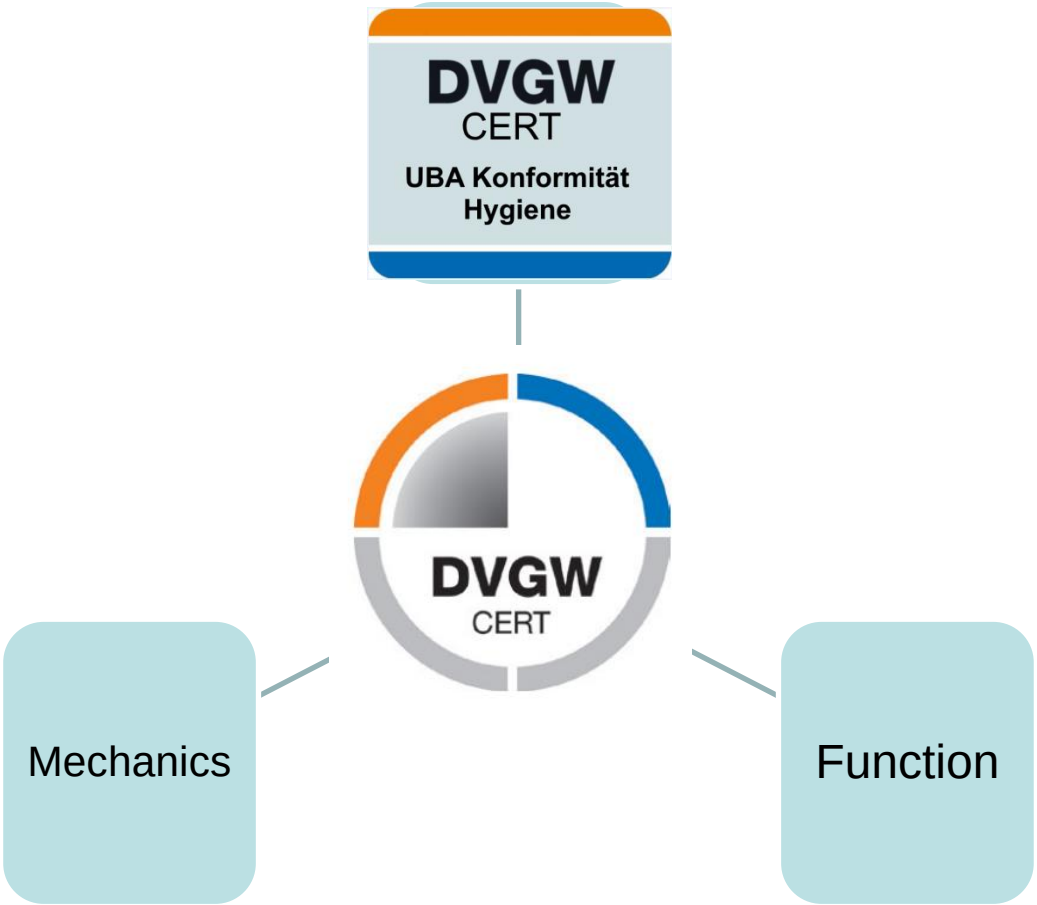
PRODUCT CERTIFICATE WITH HYGIENE CERTIFICATE



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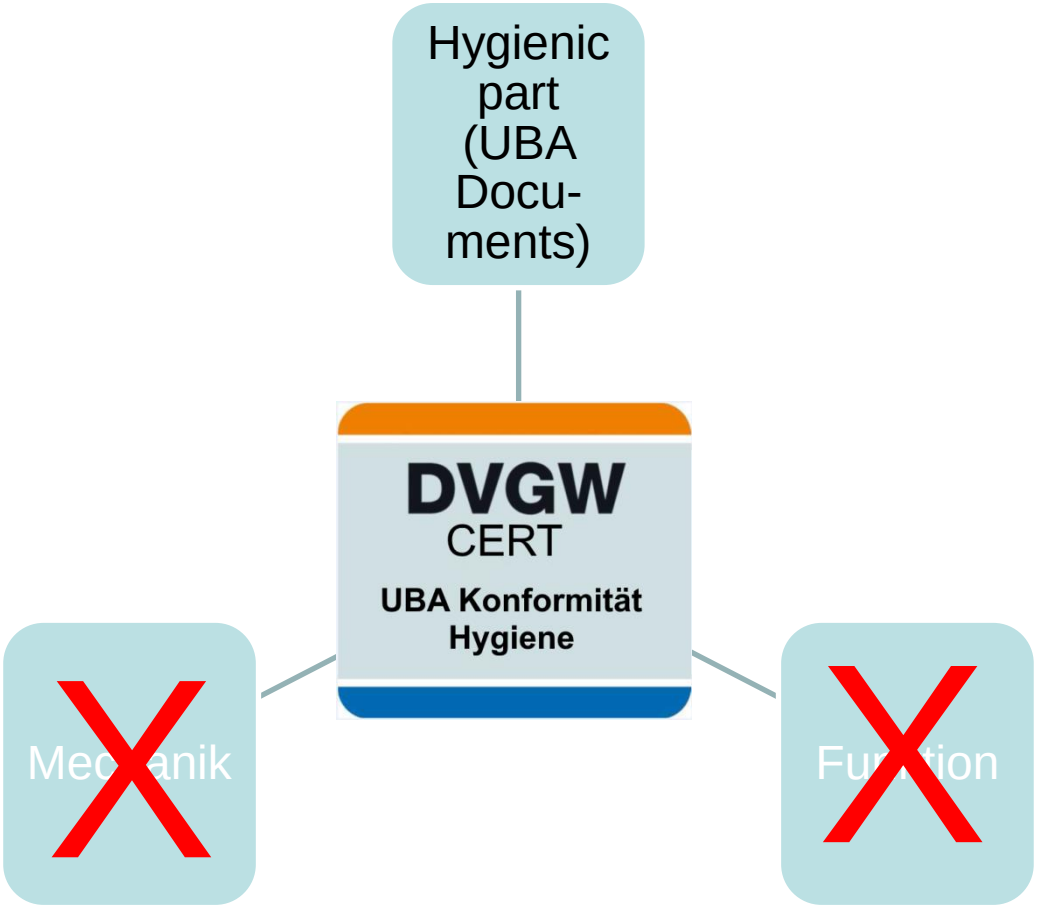
HYGIENE CERTIFICATE FOR COMPONENT / PRODUCT



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ELASTOMERS

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TIMELINE ELASTOMERS AND TPE

- **July 2021:**
  - Addition to the positive list part 1 of the elastomer guideline
- **31.12.2021:**
  - Deletion of the positive list part 2 of the elastomer guideline
  - Test certificates with substances from the positive list part 2 are invalid
- **07.03.2022:**
  - Publication of the 3rd revision of the KTW-BWGL with an addition to the area of application for elastomers and TPE
- **2022/2023/2024:**
  - Conversion of test certificates into confirmations of conformity (certificates)
  - Components with substances from the positive list Part 2 can still be used for assembled products if the test report is not older than 10 years
- **01.03.2025:**
  - Elastomer guideline and TPE transitional regulation are withdrawn
  - End of validity of test certificates

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Mid 2021 (09. July)

- New positive list published
  - With new substances (from part 2 to part 1)

  →including 2 peroxides for crosslinking (e.g. dicumyl peroxide)

- New purity requirements + migration limits

- Testing according to elastomer guideline still possible if only substances from part 1 are used

  → Test certificates valid until the end of the transitional period

12/2021 – 03/2022

- **December 31, 2021:** Deletion of the positive list part 2 of the elastomer guideline
  - Limited test certificates due to the use of substances from the positive list part 2 lose their validity (noted on test certificates)

- **March 2022:** Publication of the 3rd revision of the KTW-BWGL
  - Appendix D: Elastomers
  - Appendix E: Thermoplastic Elastomers (TPE)

- When tested according to KTW-BWGL

  → only test reports from test laboratories instead of test certificates

Options during transitional period

- Reassessment of old test reports/certificates according to the new KTW-BWGL is possible during the transition period
  - Recipe/Formulation review based on Appendix D or E
  - Checking whether test results according to the elastomer guideline meet the requirements of the KTW-BWGL
  - If necessary, verification of new migration limits (e.g. for peroxides)

- New testing according to the new KTW-BWGL

New listing in list 1 (example peroxides)

- Limitation (December 31, 2021) can be removed from test certificates according to the Elastomer Guideline if all starting substances are listed in List 1.

However:

- Usually new migration limits when substances from list 2 are evaluated and listed in list 1.
  - Review of the new migration limits required for removal of the time limit (12/31/2021) from test certificates.
  - Verification sometimes extensive and time-consuming, e.g. peroxides.
    - Dicumyl peroxide: Migration limits for peroxide and 4 reaction and degradation products.
    - 2,5-bis(tert-butylperoxy)-2,5-dimethylhexane: migration limits for peroxide, 4 reaction and degradation products and 2 impurities.

Options during transitional period

- When using substances from the positive list part 2 or in the case of new restrictions
  - Apply for listing of the substance on part 1 at the UBA
  - Changing the recipe
    - Only use substances from part 1 with some new requirements, e.g. for carbon black
  - Non-listed substances according chap. 5.2.2 of the KTW-BWGL can be used if …
    - … little amount (less than 0.02 %)
    - … ... no migration takes place (evidence e.g. via modeling or analytical methods with limit value 0.1 µg/L)

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Confirmation of Conformity

- With test certificates of the elastomer guideline or TPE transitional regulation and DVGW worksheet W 270 by the end of the transitional period.

- Test reports according to KTW-BWGL and EN 16421:
  - Certification via certification body or
  - Manufacturer's self-declaration

From March 2025

- Third revision of the KTW-BWGL with Appendix D and E become binding
  - Risk-based approach then also for elastomers and TPEs (special rule: O-rings with summation maximum P2!)

- Elastomer guideline and TPE transition regulation invalid

  → Test certificates are no longer valid

- Confirmation of conformity only for test reports according to KTW-BWGL

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EXAMPLE WATERMETER

Metalle
Kunststoffe
Elastomere
Beschichtung

Wasserzähler: Konstrukt aus unterschiedlichen Werkstoffen

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