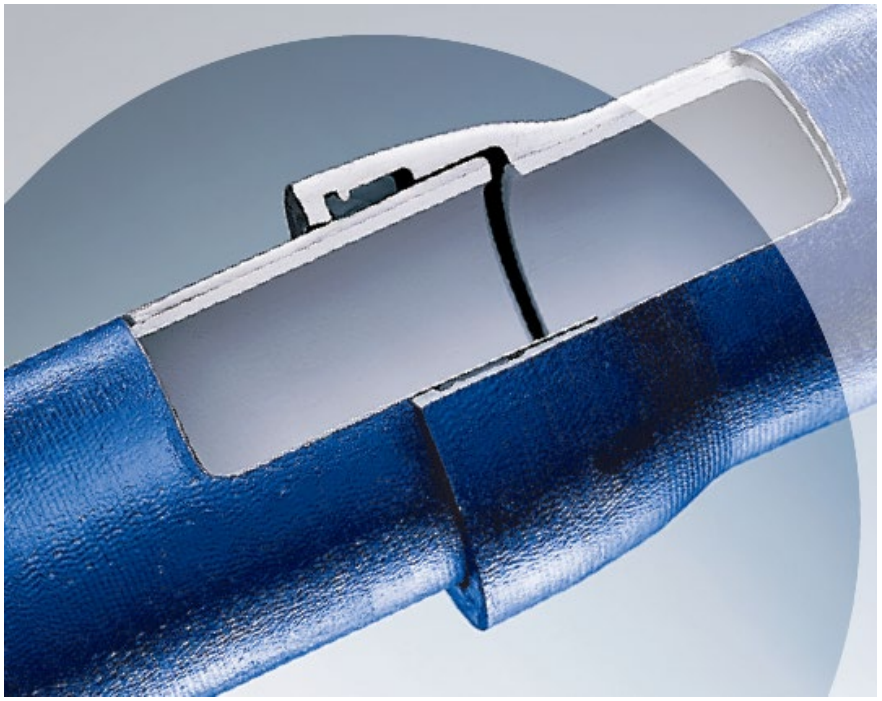
Produkt

Duktile Støpejernsrør, Ikke Strekkfaste Systemer (Duktus)

Produktdetaljer	
Produkt	Støpejernsrør, iht. EN545:2010
Utgivelses Dato	Februar, 2023
Anvendelse	Vannledninger for drikkevann
Type	Tyton kobling (muffe – spiss ende) med Tyton tetningsring. Tyton SIT PLUS® tetningsring kan benyttes for å oppnå strekkfast kobling. Iom. at det er samme type rør (ett kammer i muffen) som benyttes ved bruk av Tyton SIT PLUS® er dette systemet inkludert her under «Ikke-strekkfaste systemer»
Komponenter	Duktilt støpejern med korrosjonsbeskyttelse og tetnings ring (Tyton)
Produsent	Duktus, Tyskland
Godkjenninger / Sertifikater	Alle godkjenninger og sertifiseringer er knyttet opp til produsenten
Henvisninger	Det henvises også til følgende nyttig informasjon: • Tilhørende FDV dokument for Duktile Støpejernsrør fra Duktus • Tilhørende Monteringsanvisning for Duktile Støpejernsrør, Ikke-Strekkfaste fra Duktus • VA Miljøblad nr. 5, Grøfteutførelse fleksible rør • VA Miljøblad nr. 6, Grøfteutførelse stive rør • VA Miljøblad nr. 16, Kravspesifikasjon for duktile støpejernsrør • VA Miljøblad nr. 25, Trykkprøving av trykkledninger



Innholdsfortegnelse

1. Forkortelser

Forkortelse	Forklaring
BLS	Buderus Lock System
PFA	Tillat operasjonstrykk [Bar] (tilsvarende C-klassen)
PMA	PMA = 1.2 x PFA Tillatt maksimums operasjons trykk for en kort periode, f. eks. trykkslag [Bar]
PEA	PEA = 1.2 x PFA + 5 Tillatt trykk for trykktest [Bar]
ZMA	Høyovns - / slaggsement, innvendig sement belegg (HOZ)
ZMU	Sementmørtelbelegg

2. Introduksjon

Duktilt støpejern er produsert av resirkulert materiale, skrapjern eller stålskrap. Levetid på støpejerns rør med ZMU (sement) som utvendig beskyttelse regnes å være opptil 140 år. Støpejern gir ingen negative påvirkninger på miljøet og omgivelsene.

Støpejern som rørmateriale har vært benyttet i lang tid og man har svært god kunnskap om materialegenskapene som gjør støpejern som rørmateriale svært godt egnet for mange applikasjoner og spesielt for drikkevannssystemer. Det har også vært en stor utvikling av korrosjonsbeskyttende materialer for å motvirke korrosjon av støpejerns rør i forskjellige typer omliggende masser, en utvikling som mest sannsynlig vil fortsette i årene fremover.
Det benyttes forskjellige typer utvendig- og innvendig beskyttelse for å motvirke korrosjon av støpejerns materialet. Det er viktig at riktig korrosjonsbeskyttelse velges ved bestilling ifht. type korrosive påvirkninger fra omgivelsene / omliggende masse.

Duktile støpejerns rør er 100% diffusjonstette, som betyr at rørene er fullstendig tett for gjennomtrenging gjennom rørveggen og at fluider ikke vil trenge gjennom fra utsiden eller innsiden. F. eks. vil ikke forurensninger på utsiden av røret trenge gjennom rørveggen og forurense drikkevannet.

Min. veggtykkelser er oppgitt i tabell, sammen med C-klasse, iht. EN545:2010. Tilsvarende K-klasse er også oppgitt (fra K7-K11)

Ikke-strekkfaste duktile støpejerns rør er produsert for bruk i åpen grøft. Evt. forankringer + friksjon fra koblingen og omliggende - og overliggende masser hindrer rørene i å separeres ved trykksetting, som må beregnes før bruk.

Rørene (DN80-DN600) kan gjøres strekkfaste ved at Tyton® tetningsringen byttes ut med en Tyton SIT PLUS® - eller en VOTEC Tyton Vipers tetningsring. Systemet kalles BRS®. Ringen vil da ha funksjon for å tette i tillegg til å gi ekstra friksjon / låsing i koblingen for å gjøre systemet strekkfast.
Ved bruk av ikke-strekkfaste systemer kan det være nødvendig at man ved bend, forgreininger, reduksjoner, osv. må benytte forankringsblokker for å unngå separasjon av rørene pga. trykket i rørledningen. Ved bruk av BRS® systemet (eller BLS systemet) er det normalt ikke nødvendig å bruke forankringsblokker, mm. Det er ekstra store belastninger pga. at rørsystemet ligger i bratte bakker / skråninger.
Det bør beregnes hvilken lengde man skal benytte BRS® systemet ved bend, forgreininger, reduksjoner, osv., se f. eks. DVGW GW 368. Evt. kan hele systemet bestå av BRS® koblinger.

BRS® systemet er ikke designet for anvendelse ved grøftefrie teknikker. Her anbefaler produsenten bruk av BLS® systemet, som er en mekanisk kobling for å gjøre systemet strekkfast.

Leggelengden er 6 m.

3. Tekniske Data

DN	C-Klasse (EN545: 2010)	K-Klasse (EN545: 2006)	NRF Nr.	Vekt per stk. [kg]	Vekt per meter [kg/m]	Max. PFA [Bar]	Max. Vinkel Defl. [°]	Max. PFA [Bar]	Max. Vinkel Defl. [°]
						Tyton Kobling		BRS® Kobling	
DN80	C100	K10	2030254	94,0	15,5	100	5°	32	3°
	C50		2030255	79,1	13,0	50	5°	16	3°
DN100	C100	K10	2033181	118,4	30,9	100	5°	32	3°
	C50		2030256	98,7	16,2	50	5°	16	3°
DN125	C100	K10	2030257	155,5	25,5	100	5°	25	3°
	C64	K10	2030258	150,4	24,7	64	5°	25	3°
	C50		2030259	125,2	20,6	50	5°	16	3°
DN150	C100	K11	2033179	205,8	33,8	100	5°	25	3°
	C64	K10	2030261	183,8	30,2	64	5°	25	3°
	C64	K9	2033182	175,4	28,8	64	5°	25	3°
	C50		2030262	154,3	25,3	50	5°	16	3°
DN200	C100		2030263	323,1	53,0	100	5°	25	3°
	C64	K10	2030264	259,2	42,5	64	5°	25	3°
	C64	K9	2033183	245,4	40,2	64	5°	25	3°
	C50		2030265	209,1	34,3	50	5°	16	3°
DN250	C100		2030266	468,1	76,7	100	5°	25	3°
	C64	K10	2030267	347,4	56,9	64	5°	25	3°
	C50	K9	2033184	316,3	51,8	50	5°	25	3°
	C40		2030268	272,9	44,7	40	5°	16	3°
DN300	C64	K11	2030269	475,8	77,9	64	5°	25	3°
	C50	K9	2033185	410,0	67,1	50	5°	25	3°
	C40		2030271	351,8	57,6	40	5°	16	3°
DN400	C64		2030272	775,4	126,9	64	4°	16	2°
	C50	K10	2030273	661,5	108,3	50	4°	16	2°
	C40	K9	2033186	601,3	98,4	40	4°	16	2°
	C30	K7	2030274	513,3	84,0	30	4°	NA	NA
DN500	C50	K11	2030275	959,7	156,8	50	3°	16	2°
	C40	K9	2033101	837,4	136,8	40	3°	16	2°
	C30	K7	2030276	707,4	115,6	30	3°	NA	NA
DN600	C40	K9	2030277	1162,0	189,9	40	3°	10	2°
	C30	K9	2033102	1084,8	177,3	30	3°	NA	NA
	C30	K7	2030278	982,1	160,5	30	3°	NA	NA
DN700	C40	K10	2030279	1516,0	244,6	40	3°	NA	NA
	C30	K9	2033002	1359,6	219,4	30	3°	NA	NA
	C30	K8	2030281	1268,8	204,7	30	3°	NA	NA
	C25	K7	2030282	1173,3	189,3	25	3°	NA	NA
DN800	C30	K9	2033003	1703,4	274,3	30	3°	NA	NA
	C30	K8	2030283	1631,8	262,8	30	3°	NA	NA
	C25	K7	2030284	1479,1	238,2	25	3°	NA	NA
DN900	C30	K9	2030285	2037,6	327,5	30	3°	NA	NA
	C30	K8	2030286	1994,4	320,6	30	3°	NA	NA
	C25	K7	2030287	1798,4	289,1	25	3°	NA	NA
DN1000	C30	K9	2033004	2403,0	385,5	30	3°	NA	NA
	C30	K8	2030288	2395,9	384,4	30	3°	NA	NA
	C25	K7	2030289	2151,3	345,1	25	3°	NA	NA

Tabell 1

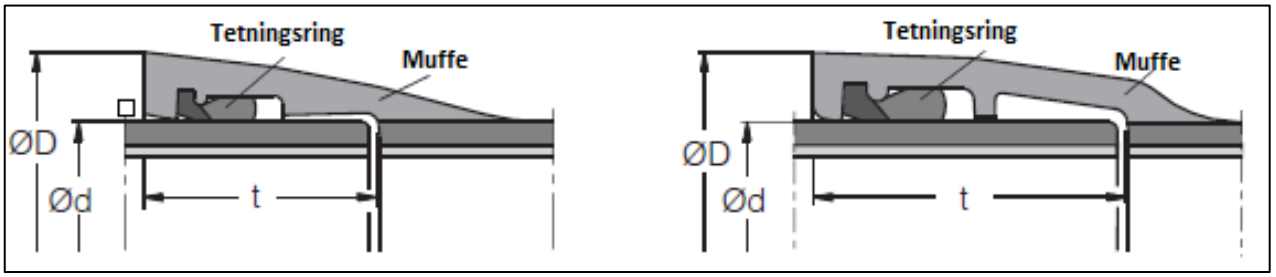
- Leggelengde: 6 m
- Vær obs på redusert PFA ved bruk av Tyton SIT PLUS® tetningsring, som angitt i kolonnen **BRS® Kobling**
- Tyton SIT PLUS® tetningsring kan kun benyttes på DN80-DN600
- **NA** under kolonne **BRS® Kobling** betyr at det ikke skal benyttes Tyton SIT PLUS® Tetningsring på denne dimensjonen / klassen.

4. Mål og Dimensjoner

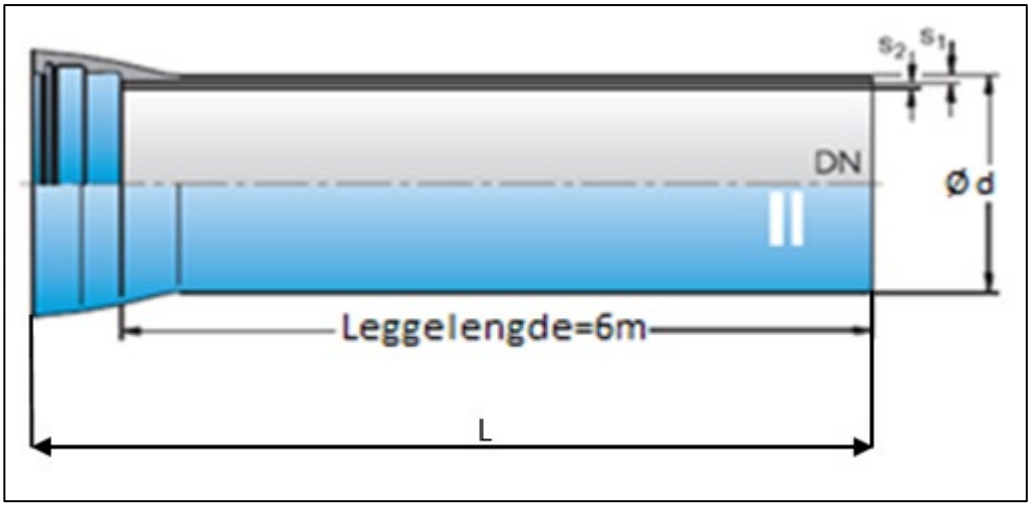
DN	C-Klasse (EN545: 2010)	K-Klasse (EN545: 2006)	NRF Nr.	ØD [mm]	Ø d [mm]	L [m]	s1 (veggtykkelse) [mm]	s2 (nom. tykkelse, ZMA) [mm]	t [mm]
DN80	C100	K10	2030254	142	98 +1 / -2,7	6,084	4,7	4	84
	C50		2030255				3,5		
DN100	C100	K10	2033181	163	118 +1 / -2,8	6,088	4,7	4	88
	C50		2030256				3,5		
DN125	C100	(K10)	2030257	190	144 +1 / -2,8	6,091	5,0	4	91
	(C64)	K10	2030258				4,8		
	C50		2030259				3,5		
DN150	C100	(K11)	2033179	217	170 +1 / -2,9	6,094	5,9	4	94
	(C64)	K10	2030261				5,0		
	(C64)	K9	2033182				4,7		
	(C50)*		2030262				3,7		
DN200	C100	(K11)	2030263	278	222 +1 / -3,0	6,100	7,7	4	100
	(C64)	K10	2030264				5,5		
	C64	(K9)	2033183				5,0		
	C50		2030265				3,9		
DN250	C100	(K11)	2030266	336	274 +1 / -3,1	6,105	9,5	4	105
	C64	(K10)	2030267				6,1		
	(C50)	K9	2033184				5,2		
	C40*		2030268				4,2		
DN300	C64	(K11)	2030269	385	326 +1 / -3,3	6,110	7,3	4	110
	C50	(K9)	2033185				5,7		
	C40		2030271				4,6		
DN400	C64	(K11)	2030272	500	429 +1 / -3,5	6,110	9,6	5	110
	C50	(K10)	2030273				7,5		
	(C40)	K9	2033186				6,4		
	C30	(K7)	2030274				4,8		
DN500	C50	(K11)	2030275	607	532 +1 / -3,8	6,120	9,3	5	120
	C40	(K9)	2033101				7,5		
	C30	(K7)	2030276				5,6		
DN600	C40	(K9)	2030277	732	635 +1 / -4,0	6,120	8,9	5	120
	(C30)	K9	2033102				8,0		
	C30	(K7)	2030278				6,7		
DN700	C40	(K10)	2030279	849	738 +1 / -4,3	6,197	10,4	6	197
	(C30)	K9	2033002				8,8		
	C30	(K8)	2030281				7,8		
	C25	(K7)	2030282				6,8		
DN800	(C30)	K9	2033003	960	842 +1 / -4,5	6,209	9,6	6	209
	C30	(K8)	2030283				8,9		
	C25	(K7)	2030284				7,5		
DN900	(C30)	K9	2030285	1073	945 +1 / -4,8	6,221	10,4	6	221
	C30	(K8)	2030286				10,0		
	C25	(K7)	2030287				8,4		
DN1000	(C30)	K9	2033004	1188	1048 +1 / -5,0	6,233	11,2	6	233
	C30	(K8)	2030288				11,1		
	C25	(K7)	2030289				9,3		

Tabell 2

Om klassen i kolonnene C-Klasse og K-klasse er uten parentes er det det direkte klassen på røret. Om klassen er satt med parentes er det *lavere tilsvarende* klasse. K-klassene oppgitt er K7 – K11.
* C40 iht. EN545:2006



DN80 - DN600 DN700 - DN1000



5. Tekniske Data

Leggelengde	6 meter
Materiale	Duktilt Støpejern
Fluidtemperatur	0 til 50° C
Innvendig beskyttelse	ZMA er en høyovns - / slaggsement (HOZ)
Utvendig beskyttelse	**Epoxy** • Min. 400 g/m² Sink-Aluminium legering (Zn 85% + Al 15%) • Blå Epoxy, minimum tykkelse 70 µm
Tetnings ring	Tyton: Materiale i EPDM (godkjent for drikkevann)

6. Material Karakteristikk, Støpejern

Karakteristikk	Verdi	Enhet
Bruddstyrke	420	N/mm²
Flytstyrke	300	0 N/mm²
Forlengelse etter brudd	≥ 10	%
Trykk styrke	900	N/mm²
Elastisitetsmodul	170,000	N/mm²
Oscillasjonsbåndbredde (DIN 50 100)	135	N/mm²
Gjennomsnitts koeffisient, termisk ekspansjon	10 x 10-6	m/mK
Termisk konduktivitet	0.42	W/cmK

7. Tekniske Karakteristikker

EPOXY

Omliggende Masser

Kan installeres i alle typer jordmasser, bortsett fra:

- Myromåder og masser med høyt innhold av organiske masse med lav pH
- Omliggende masser med innhold av avfall, aske, slagg eller forurensninger fra industri eller andre forurensninger
- Omliggende masser beliggende under marint vann-nivå med en motstand lavere enn 500 Ω*cm

Største tillatte nominelle kornstørrelse i fundamentet, iht. **VA Miljøblad nr. 6, Grøfteutførelse stive rør** og **NS 3420-F**:

- Velgraderte masser: 32 mm
- Ensgraderte masser: 22 mm

Medie

Drikkevann / Råvann
Innvendig sementbelegg, ZMA (HOZ), er motstandsdyktig mot sulfater

Parameter	pH Minimum	Aggressive CO_2 [mg/l] Maksimum	Sulfater, SO_4 [mg/l] Maksimum	Magnesium, Mg [mg/l] Maksimum	Ammonium, NH_4 [mg/l] Maksimum
Verdi	5.5	15	3000	500	30

8. Standarder, Godkjenninger og Sertifikater

Godkjenninger / Sertifikater	Alle godkjenninger og sertifiseringer er knyttet opp til produsenten. • Produksjon: ISO 9001 • EN ISO 14 001 • EN ISO 16 001 • DIN EN ISO 50001:2011 • DVGW (German Technical and Scientific Association for Gas and Water), DVGW-BPZ-BL0610, DVGW Type Exam. Cert. • EN 15 542 • DIN 28 603	
Ledelse / Produksjon	Sertifikat, ISO 9001, Ledelsessystem	Vedlegg 1
	Sertifikat, ISO 9001, Produksjonssystem	Vedlegg 2
	ISO 14001, Ledelsessystem	Vedlegg 3
	ISO 14001, Produksjonssystem	Vedlegg 4
	DIN EN ISO 50001, 2011, Ledelsessystem	Vedlegg 5
	DIN EN ISO 50001, 2011, Produksjonssystem	Vedlegg 6
Produkt	CE Ytelses Erklæring	Vedlegg 7
	FM Godkjenning	Vedlegg 8
	DVGW-BPZ-BL0610, DVGW Type Exam. Cert., DN80-DN600	Vedlegg 9
	DVGW-BPZ-BL0610, DVGW Type Exam. Cert., DN700-DN1000	Vedlegg 10
	Inspeksjon, ISO 2531, DIN EN 545, DVGW GW 337 (MA 39)	Vedlegg 11
Komponenter	Technical Data Sheet, 601.3, Epoxy Coating (produksjon)	Vedlegg 12
	Safety Data Sheet, Epoxy Coating (produksjon)	Vedlegg 13
	Safety Data Sheet, Hardener (produksjon)	Vedlegg 14
	Safety Data Sheet, Epoxy Coating (rep.)	Vedlegg 15

Standarder	EN 545	Rør, rørdeler og tilbehør av duktilt støpejern samt deres sammenføyninger for vannledninger - Krav og prøvingsmetoder
	EN 15 542	Rør av duktilt støpejern, rørdeler og tilbehør - Utvendig sementmørtelbelegg for rør - Krav og prøvingsmetoder
	DVGW W 270	Microbial Enhancement on Materials to Come into Contact with Drinking Water – Testing and Assessment
	DVGW GW 337 P	Pipes, fittings and accessory parts made of ductile cast iron for gas and water supply - Requirements and inspections
	DVGW W 347	Hygienic requirements for Concrete-Bound Materials for Drinking Water Systems - Testing and Evaluation
	DVGW W 348	Requirements for bituminous coatings of fittings made of ductile cast iron and in connections of pipes made of ductile cast iron, non-alloy and low-alloy steel
	UBA Besch-LL	
	UBA Elastom	
	DIN 28 603	Ductile iron pipes and fittings - Push-in joints - Survey, sockets and gaskets
	DIN 28 650	Ductile iron fittings - Double socket 30° bends, EN-fittings, MI-fittings, IT-fittings

Vedlegg 1

ZERTIFIKAT

für das Managementsystem nach

DIN EN ISO 9001:2015

Der Nachweis der regelkonformen Anwendung wurde erbracht.

Zertifikatsinhaber:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
D-35576 Wetzlar

mit dem Standort bei:

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
D-35576 Wetzlar

Geltungsbereich:

Vertrieb von Rohrleitungssystemen aus duktilem Gusseisen
für den Transport von Wasser und Abwasser einschließlich spezieller Anwendungen
für Wasserkraftwerke, Beschneiungsanlagen und Feuerlöschsysteme
sowie für grabenlose Verlegetechniken und Pfahlsysteme für den Spezialtiefbau,
Armaturen, Hydranten, Messtechnik und Entwässerungstechnik.

Zertifikat-Registrier-Nr. **73 100 954-2** Zertifikat gültig von 2022-12-20 bis **2025-12-19**

Auditbericht-Nr. 4406 9247

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Zertifizierungsstelle des TÜV Hessen
– Der Zertifizierungsstellenleiter –

Diese Zertifizierung bestätigt die Einführung und Aufrechterhaltung des o.a. Managementsystems und wird regelmäßig überwacht.
Die aktuelle Gültigkeit ist nachprüfbar unter www.proficert.com. Originalzertifikate enthalten ein aufgeklebtes Hologramm.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Straße 16, D-64293 Darmstadt, Tel. +49 6151/600331 Rev-DE-2001

CERTIFICATE

for a management system as per

DIN EN ISO 9001:2015

Evidence of conformity has been furnished.

PRODUCTION

Certificate holder:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germany

with the location at:

HYDRO

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
35576 Wetzlar / Germany

scope:

The sale of pipework systems made from ductile cast iron for the conveyance of water and sewage including special applications for hydroelectric power stations, snow-making equipment and fire extinguishing systems as well as for non-disruptive pipe installation techniques and piling systems for special foundation engineering works, fittings, hydrants, metrology and drainage engineering.

Certificate registration No. **73 100 954-2**

Certificate valid from 2022-12-20 to **2025-12-19**

Audit report No. 4406 9247

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Certification body of TÜV Hessen
– Head of Certification body –

This certification confirms the introduction and maintenance of the Management system specified above and is monitored regularly.
The current validity is verifiable at www.proficert.com. Original certificates contain a glued hologram.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Strasse 16, D-64293 Darmstadt, Germany, Phone +49 6151/600331 Rev-GB-2001

TÜV PROFI CERT

TÜV HESSEN

CERTIFICATO

per il sistema di gestione secondo

DIN EN ISO 9001:2015

Sono state fornite evidenze della conformità.

VR PRODUCTION

Licenziatario Certificato:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germania

con la posizione a:

VROLLN HYDRO

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
35576 Wetzlar / Germania

Campo di applicazione:

Vendita di sistemi di tubature in ghisa duttile per il trasporto di acqua e acqua di scarico e per utilizzi speciali per centrali idroelettriche, impianti di innevamento e sistemi antincendio nonché per tecniche di posa trenchless e sistemi di pilastri per opere di costruzione sotterranee speciali, rubinetterie, idranti, tecnica di misurazione e di drenaggio.

Nº registrazione certificato **73 100 954-2** Certificato valido da 2022-12-20 a **2025-12-19**

Rapporto di Audit 4406 9247

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

DAkkS Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Organismo di Certificazione del TÜV Hessen
– Responsabile della certificazione –

La presente certificazione conferma l'introduzione e il mantenimento del suddetto sistema di gestione e viene monitorata periodicamente.
Verificabile sul sito www.proficert.com. I certificati originali contengono un ologramma incollato.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Straße 16, D-64293 Darmstadt, Tel. +49 6151/600331 Rev-IT-2001

CERTIFICAT

Pour le système de management selon

DIN EN ISO 9001:2015

La preuve de l'utilisation conforme a été établie.

Titulaire de la certification:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Allemagne

avec l'emplacement à:

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
35576 Wetzlar / Allemagne

Domaine d'application:

Distribution de tuyaux en fonte ductile pour le transport de l'eau et des eaux usées, y compris les applications spéciales pour des centrales hydroélectriques, des systèmes d'enneigement et des installations d'extinction d'incendie, ainsi que pour les techniques de pose sans tranchée et systèmes de pieux pour des fondations, robinetterie, poteaux d'incendie, technique de mesure et d'évacuation des eaux.

Certificat enregistré sous le n° **73 100 954-2** Certificat valable du 2022-12-20 au **2025-12-19**

Rapport-Audit n° 4406 9247

DAkkS Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Organisme de certification du TÜV Hessen
– Le chef de service de la certification –

Vedlegg 2

TÜV PROFI CERT

TÜV HESSEN

ZERTIFIKAT

für das Managementsystem nach

DIN EN ISO 9001:2015

Der Nachweis der regelkonformen Anwendung wurde erbracht.

VR

PRODUCTION

Zertifikatsinhaber:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
D-35576 Wetzlar

mit dem Standort bei:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
D-35576 Wetzlar

Geltungsbereich:

Entwicklung und Herstellung von Rohrleitungssystemen aus duktilem Gusseisen für den Transport von Wasser und Abwasser einschließlich spezieller Anwendungen für Wasserkraftwerke, Beschneiungsanlagen, Industrieanwendungen und Feuerlöschsysteme sowie für grabenlose Verlegetechniken und Pfahlsysteme für den Spezialtiefbau.

Zertifikat-Registrier-Nr. **73 100 954-1** Zertifikat gültig von 2022-12-20 bis **2025-12-19**

Auditbericht-Nr. 4406 9247

TÜV HESSEN

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

DAkkS Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Zertifizierungsstelle des TÜV Hessen
– Der Zertifizierungsstellenleiter –

CERTIFICATE

for a management system as per

DIN EN ISO 9001:2015

Evidence of conformity has been furnished.

VR

PRODUCTION

Certificate holder:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germany

with the location at:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germany

scope:

The development and production of pipework systems made from ductile cast iron for the conveyance of water and sewage including special applications for hydroelectric power stations, snow-making equipment, industrial applications and fire extinguishing systems as well as for non-disruptive pipe installation techniques and piling systems for special foundation engineering works.

Certificate registration No. **73 100 954-1**

Certificate valid from 2022-12-20 to **2025-12-19**

Audit report No. 4406 9247

DAkkS Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Certification body of TÜV Hessen
– Head of Certification body –

CERTIFICATO

per il sistema di gestione secondo

DIN EN ISO 9001:2015

Sono state fornite evidenze della conformità.

PRODUCTION

Licenziatario Certificato:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germania

con la posizione a:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germania

Campo di applicazione:

Sviluppo e produzione di sistemi di tubature in ghisa duttile per il trasporto di acqua e acqua di scarico e per utilizzi speciali per centrali idroelettriche, impianti di innevamento, applicazioni industriali e sistemi antincendio nonché per tecniche di posa trenchless e sistemi di pilastri per opere di costruzione sotterranee speciali.

Nº registrazione certificato **73 100 954-1** Certificato valido da 2022-12-20 a **2025-12-19**

Rapporto di Audit 4406 9247

DAkkS Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Organismo di Certificazione del TÜV Hessen
– Responsabile della certificazione –

La presente certificazione conferma l'introduzione e il mantenimento del suddetto sistema di gestione e viene monitorata periodicamente.
Verificabile sul sito www.proficert.com. I certificati originali contengono un ologramma incollato.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Straße 16, D-64293 Darmstadt, Tel. +49 6151/600331 Rev-IT-2001

CERTIFICAT

Pour le système de management selon

DIN EN ISO 9001:2015

La preuve de l'utilisation conforme a été établie.

PRODUCTION

Titulaire de la certification:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Allemagne

avec l'emplacement à:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Allemagne

Domaine d'application:

Développement et fabrication de systèmes de tuyaux en fonte ductile pour le transport de l'eau et des eaux usées, y compris les applications spéciales pour des centrales hydroélectriques, systèmes d'enneigement, applications industrielles et d'extinction d'incendie ainsi que pour les techniques d'installation sans tranchée et les systèmes d'extinction d'incendie. Systèmes de pieux pour des fondations.

Certificat enregistré sous le n° **73 100 954-1** Certificat valable du 2022-12-20 au **2025-12-19**

Rapport-Audit n° 4406 9247

DAkkS Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Organisme de certification du TÜV Hessen
– Le chef de service de la certification –

Vedlegg 3

ZERTIFIKAT

für das Managementsystem nach

DIN EN ISO 14001:2015

Der Nachweis der regelkonformen Anwendung wurde erbracht.

Zertifikatsinhaber:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
D-35576 Wetzlar

mit dem Standort bei:

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
D-35576 Wetzlar

Geltungsbereich:

Vertrieb von Rohrleitungssystemen aus duktilem Gusseisen
für den Transport von Wasser und Abwasser einschließlich spezieller Anwendungen
für Wasserkraftwerke, Beschneiungsanlagen und Feuerlöschsysteme
sowie für grabenlose Verlegetechniken und Pfahlsysteme für den Spezialtiefbau,
Armaturen, Hydranten, Messtechnik und Entwässerungstechnik.

Zertifikat-Registrier-Nr. **73 100 954-2** Zertifikat gültig von 2022-12-20 bis **2025-12-19**

Auditbericht-Nr. 4406 9247

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Zertifizierungsstelle des TÜV Hessen
– Der Zertifizierungsstellenleiter –

Diese Zertifizierung bestätigt die Einführung und Aufrechterhaltung des o.a. Managementsystems und wird regelmäßig überwacht.
Die aktuelle Gültigkeit ist nachprüfbar unter www.proficert.com. Originalzertifikate enthalten ein aufgeklebtes Hologramm.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Straße 16, D-64293 Darmstadt, Tel. +49 6151/600331 Rev-DE-2001

CERTIFICATE

for a management system as per

DIN EN ISO 14001:2015

Evidence of conformity has been furnished.

PRODUCTION

Certificate holder:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germany

with the location at:

HYDRO

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
35576 Wetzlar / Germany

scope:

The sale of pipework systems made from ductile cast iron for the conveyance of water and sewage including special applications for hydroelectric power stations, snow-making equipment and fire extinguishing systems as well as for non-disruptive pipe installation techniques and piling systems for special foundation engineering works, fittings, hydrants, metrology and drainage engineering.

Certificate registration No. **73 104 954-2**

Certificate valid from 2022-12-20 to **2025-12-19**

Audit report No. 4406 9247

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Certification body of TÜV Hessen
– Head of Certification body –

This certification confirms the introduction and maintenance of the Management system specified above and is monitored regularly.
The current validity is verifiable at www.proficert.com. Original certificates contain a glued hologram.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Strasse 16, D-64293 Darmstadt, Germany, Phone +49 6151/600331 Rev-GB-2001

CERTIFICATO

per il sistema di gestione secondo

DIN EN ISO 14001:2015

Sono state fornite evidenze della conformità.

Licenziatario Certificato:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germania

con la posizione a:

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
35576 Wetzlar / Germania

Campo di applicazione:

Vendita di sistemi di tubature in ghisa duttile per il trasporto di acqua e acqua di scarico e per utilizzi speciali per centrali idroelettriche, impianti di innevamento e sistemi antincendio nonché per tecniche di posa trenchless e sistemi di pilastri per opere di costruzione sotterranee speciali, rubinetterie, idranti, tecnica di misurazione e di drenaggio.

Nº registrazione certificato **73 104 954-2** Certificato valido da 2022-12-20 a **2025-12-19**

Rapporto di Audit 4406 9247

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Organismo di Certificazione del TÜV Hessen
– Responsabile della certificazione –

La presente certificazione conferma l'introduzione e il mantenimento del suddetto sistema di gestione e viene monitorata periodicamente.
Verificabile sul sito www.proficert.com. I certificati originali contengono un ologramma incollato.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Straße 16, D-64293 Darmstadt, Tel. +49 6151/600331 Rev-IT-2001

CERTIFICAT

Pour le système de management selon

DIN EN ISO 14001:2015

La preuve de l'utilisation conforme a été établie.

Titulaire de la certification:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Allemagne

avec l'emplacement à:

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
35576 Wetzlar / Allemagne

Domaine d'application:

Distribution de tuyaux en fonte ductile pour le transport de l'eau et des eaux usées, y compris les applications spéciales pour des centrales hydroélectriques, des systèmes d'enneigement et des installations d'extinction d'incendie, ainsi que pour les techniques de pose sans tranchée et systèmes de pieux pour des fondations, robinetterie, poteaux d'incendie, technique de mesure et d'évacuation des eaux.

Certificat enregistré sous le n° **73 104 954-2** Certificat valable du 2022-12-20 au **2025-12-19**

Rapport-Audit n° 4406 9247

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Organisme de certification du TÜV Hessen
– Le chef de service de la certification –

Vedlegg 4

TÜV PROFI CERT

TÜV HESSEN

ZERTIFIKAT

für das Managementsystem nach

DIN EN ISO 14001:2015

Der Nachweis der regelkonformen Anwendung wurde erbracht.

VR

PRODUCTION

Zertifikatsinhaber:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
D-35576 Wetzlar

mit dem Standort bei:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
D-35576 Wetzlar

Geltungsbereich:

Entwicklung und Herstellung von Rohrleitungssystemen aus duktilem Gusseisen für den Transport von Wasser und Abwasser einschließlich spezieller Anwendungen für Wasserkraftwerke, Beschneiungsanlagen, Industrieanwendungen und Feuerlöschsysteme sowie für grabenlose Verlegetechniken und Pfahlsysteme für den Spezialtiefbau.

Zertifikat-Registrier-Nr. **73 104 954-1** Zertifikat gültig von 2022-12-20 bis **2025-12-19**

Auditbericht-Nr. 4406 9247

TÜV HESSEN

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

DAkkS Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Zertifizierungsstelle des TÜV Hessen
– Der Zertifizierungsstellenleiter –

CERTIFICATE

for a management system as per

DIN EN ISO 14001:2015

Evidence of conformity has been furnished.

VR

PRODUCTION

Certificate holder:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germany

with the location at:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germany

scope:

The development and production of pipework systems made from ductile cast iron for the conveyance of water and sewage including special applications for hydroelectric power stations, snow-making equipment, industrial applications and fire extinguishing systems as well as for non-disruptive pipe installation techniques and piling systems for special foundation engineering works.

Certificate registration No. **73 104 954-1**

Certificate valid from 2022-12-20 to **2025-12-19**

Audit report No. 4406 9247

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Certification body of TÜV Hessen
– Head of Certification body –

This certification confirms the introduction and maintenance of the Management system specified above and is monitored regularly.
The current validity is verifiable at www.proficert.com. Original certificates contain a glued hologram.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Strasse 16, D-64293 Darmstadt, Germany, Phone +49 6151/600331 Rev-GB-2001

TÜV PROFI CERT

TÜV HESSEN

CERTIFICATO

per il sistema di gestione secondo

DIN EN ISO 14001:2015

Sono state fornite evidenze della conformità.

VR

PRODUCTION

Licenziatario Certificato:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germania

con la posizione a:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germania

Campo di applicazione:

Sviluppo e produzione di sistemi di tubature in ghisa duttile per il trasporto di acqua e acqua di scarico e per utilizzi speciali per centrali idroelettriche, impianti di innevamento, applicazioni industriali e sistemi antincendio nonché per tecniche di posa trenchless e sistemi di pilastri per opere di costruzione sotterranee speciali.

Nº registrazione certificato **73 104 954-1** Certificato valido da 2022-12-20 a **2025-12-19**

Rapporto di Audit 4406 9247

TÜV HESSEN

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

DAkkS Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Organismo di Certificazione del TÜV Hessen
– Responsabile della certificazione –

La presente certificazione conferma l'introduzione e il mantenimento del suddetto sistema di gestione e viene monitorata periodicamente.
Verificabile sul sito www.proficert.com. I certificati originali contengono un ologramma incollato.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Straße 16, D-64293 Darmstadt, Tel. +49 6151/600331 Rev-IT-2001

CERTIFICAT

Pour le système de management selon

DIN EN ISO 14001:2015

La preuve de l'utilisation conforme a été établie.

PRODUCTION

Titulaire de la certification:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Allemagne

avec l'emplacement à:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Allemagne

Domaine d'application:

Développement et fabrication de systèmes de tuyaux en fonte ductile pour le transport de l'eau et des eaux usées, y compris les applications spéciales pour des centrales hydroélectriques, systèmes d'enneigement, applications industrielles et d'extinction d'incendie ainsi que pour les techniques d'installation sans tranchée et les systèmes d'extinction d'incendie. Systèmes de pieux pour des fondations.

Certificat enregistré sous le n° **73 104 954-1** Certificat valable du 2022-12-20 au **2025-12-19**

Rapport-Audit n° 4406 9247

DAkkS Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2022-12-12
Organisme de certification du TÜV Hessen
– Le chef de service de la certification –

Ce certificat confirme l'introduction et le maintien du système de gestion indiqué ci-dessus, lequel fera l'objet d'un contrôle régulier.
L'actuelle validité est vérifiable sous www.proficert.com. Les certificats originaux contiennent un hologramme collé.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Straße 16, D-64293 Darmstadt, Tel. +49 6151/600331 Rev-FR-2001

Vedlegg 5

ZERTIFIKAT

für das Managementsystem nach

DIN EN ISO 50001:2018

Der Nachweis der regelkonformen Anwendung wurde erbracht.

Zertifikatsinhaber:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
D-35576 Wetzlar

mit dem Standort bei:

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
D-35576 Wetzlar

Geltungsbereich:

Vertrieb von Rohrleitungssystemen aus duktilem Gusseisen
für den Transport von Wasser und Abwasser einschließlich spezieller Anwendungen
für Wasserkraftwerke, Beschneiungsanlagen und Feuerlöschsysteme
sowie für grabenlose Verlegetechniken und Pfahlsysteme für den Spezialtiefbau,
Armaturen, Hydranten, Messtechnik und Entwässerungstechnik.

Zertifikat-Registrier-Nr. **73 130 954-2** Zertifikat gültig von 2021-07-27 bis **2024-07-26**

Auditbericht-Nr. 4386 4870

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2021-12-13
Zertifizierungsstelle des TÜV Hessen
– Der Zertifizierungsstellenleiter –

CERTIFICATE

for a management system as per

DIN EN ISO 50001:2018

Evidence of conformity has been furnished.

PRODUCTION

Certificate holder:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germany

with the location at:

HYDRO

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
35576 Wetzlar / Germany

scope:

The sale of pipework systems made from ductile cast iron for the conveyance of water and sewage including special applications for hydroelectric power stations, snow-making equipment and fire extinguishing systems as well as for non-disruptive pipe installation techniques and piling systems for special foundation engineering works, fittings, hydrants, metrology and drainage engineering.

Certificate registration No. **73 130 954-2**

Certificate valid from 2021-07-27 to **2024-07-26**

Audit report No. 4386 4870

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2021-12-13
Certification body of TÜV Hessen
– Head of Certification body –

This certification confirms the introduction and maintenance of the Management system specified above and is monitored regularly.
The current validity is verifiable at www.proficert.com. Original certificates contain a glued hologram.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Strasse 16, D-64293 Darmstadt, Germany, Phone +49 6151/600331 Rev-GB-2001

CERTIFICATO

per il sistema di gestione secondo

EN ISO 50001:2018

Sono state fornite evidenze della conformità.

Licenziatario Certificato:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germania

con la posizione a:

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
35576 Wetzlar / Germania

Campo di applicazione:

Vendita di sistemi di tubature in ghisa duttile per il trasporto di acqua e acqua di scarico e per utilizzi speciali per centrali idroelettriche, impianti di innevamento e sistemi antincendio nonché per tecniche di posa trenchless e sistemi di pilastri per opere di costruzione sotterranee speciali, rubinetterie, idranti, tecnica di misurazione e di drenaggio.

Nº registrazione certificato **73 130 954-2** Certificato valido da 2021-07-27 a **2024-07-26**

Rapporto di Audit 4386 4870

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2021-12-13
Organismo di Certificazione del TÜV Hessen
– Responsabile della certificazione –

La presente certificazione conferma l'introduzione e il mantenimento del suddetto sistema di gestione e viene monitorata periodicamente.
Verificabile sul sito www.proficert.com. I certificati originali contengono un ologramma incollato.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Straße 16, D-64293 Darmstadt, Tel. +49 6151/600331 Rev-IT-2001

CERTIFICAT

Pour le système de management selon

EN ISO 50001:2018

La preuve de l'utilisation conforme a été établie.

Titulaire de la certification:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Allemagne

avec l'emplacement à:

vonRoll hydro (deutschland) gmbh & co. kg
Sophienstraße 52-54
35576 Wetzlar / Allemagne

Domaine d'application:

Distribution de tuyaux en fonte ductile pour le transport de l'eau et des eaux usées, y compris les applications spéciales pour des centrales hydroélectriques, des systèmes d'enneigement et des installations d'extinction d'incendie, ainsi que pour les techniques de pose sans tranchée et systèmes de pieux pour des fondations, robinetterie, poteaux d'incendie, technique de mesure et d'évacuation des eaux.

Certificat enregistré sous le n° **73 130 954-2** Certificat valable du 2021-07-27 au **2024-07-26**

Rapport-Audit n° 4386 4870

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2021-12-13
Organisme de certification du TÜV Hessen
– Le chef de service de la certification –

Vedlegg 6

TÜV PROFI CERT

ZERTIFIKAT

für das Managementsystem nach

DIN EN ISO 50001:2018

Der Nachweis der regelkonformen Anwendung wurde erbracht.

VR

PRODUCTION

Zertifikatsinhaber:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
D-35576 Wetzlar

mit dem Standort bei:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
D-35576 Wetzlar

Geltungsbereich:

Entwicklung und Herstellung von Rohrleitungssystemen aus duktilem Gusseisen für den Transport von Wasser und Abwasser einschließlich spezieller Anwendungen für Wasserkraftwerke, Beschneiungsanlagen, Industrieanwendungen und Feuerlöschsysteme sowie für grabenlose Verlegetechniken und Pfahlsysteme für den Spezialtiefbau.

Zertifikat-Registrier-Nr. **73 130 954-1** Zertifikat gültig von 2021-07-27 bis **2024-07-26**

Auditbericht-Nr. 4386 4870

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2021-12-13
Zertifizierungsstelle des TÜV Hessen
– Der Zertifizierungsstellenleiter –

CERTIFICATE

for a management system as per

DIN EN ISO 50001:2018

Evidence of conformity has been furnished.

VR

PRODUCTION

Certificate holder:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germany

with the location at:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germany

scope:

The development and production of pipework systems made from ductile cast iron for the conveyance of water and sewage including special applications for hydroelectric power stations, snow-making equipment, industrial applications and fire extinguishing systems as well as for non-disruptive pipe installation techniques and piling systems for special foundation engineering works.

Certificate registration No. **73 130 954-1**

Certificate valid from 2021-07-27 to **2024-07-26**

Audit report No. 4386 4870

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2021-12-13
Certification body of TÜV Hessen
– Head of Certification body –

This certification confirms the introduction and maintenance of the Management system specified above and is monitored regularly.
The current validity is verifiable at www.proficert.com. Original certificates contain a glued hologram.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Strasse 16, D-64293 Darmstadt, Germany, Phone +49 6151/600331 Rev-GB-2001

CERTIFICATO

per il sistema di gestione secondo

EN ISO 50001:2018

Sono state fornite evidenze della conformità.

PRODUCTION

Licenziatario Certificato:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germania

con la posizione a:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Germania

Campo di applicazione:

Sviluppo e produzione di sistemi di tubature in ghisa duttile per il trasporto di acqua e acqua di scarico e per utilizzi speciali per centrali idroelettriche, impianti di innevamento, applicazioni industriali e sistemi antincendio nonché per tecniche di posa trenchless e sistemi di pilastri per opere di costruzione sotterranee speciali.

Nº registrazione certificato **73 130 954-1** Certificato valido da 2021-07-27 a **2024-07-26**

Rapporto di Audit 4386 4870

Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2021-12-13
Organismo di Certificazione del TÜV Hessen
– Responsabile della certificazione –

La presente certificazione conferma l'introduzione e il mantenimento del suddetto sistema di gestione e viene monitorata periodicamente.
Verificabile sul sito www.proficert.com. I certificati originali contengono un ologramma incollato.
TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Straße 16, D-64293 Darmstadt, Tel. +49 6151/600331 Rev-IT-2001

CERTIFICAT

Pour le système de management selon

EN ISO 50001:2018

La preuve de l'utilisation conforme a été établie.

PRODUCTION

Titulaire de la certification:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Allemagne

avec l'emplacement à:

vR production (DUKTUS) gmbh
Sophienstraße 52-54
35576 Wetzlar / Allemagne

Domaine d'application:

Développement et fabrication de systèmes de tuyaux en fonte ductile pour le transport de l'eau et des eaux usées, y compris les applications spéciales pour des centrales hydroélectriques, systèmes d'enneigement, applications industrielles et d'extinction d'incendie ainsi que pour les techniques d'installation sans tranchée et les systèmes d'extinction d'incendie. Systèmes de pieux pour des fondations.

Certificat enregistré sous le n° **73 130 954-1** Certificat valable du 2021-07-27 au **2024-07-26**

Rapport-Audit n° 4386 4870

DAkkS Deutsche Akkreditierungsstelle D-ZM-14137-01-00

Darmstadt, 2021-12-13
Organisme de certification du TÜV Hessen
– Le chef de service de la certification –

Vedlegg 7

Duktus (Production) GmbH
Sophienstraße 52–54
35576 Wetzlar
Germany

T + 49 (0) 6441 49-01
Fax +49 (0) 6441 49-1303
www.duktus.com

Konformitätserklärung
Declaration of Conformity

Gemäß EG-Bauproduktenrichtlinie 89/106/EWG
In accordance with EU Construction Products Directive 89/106/EEC

Hersteller Manufacturer	Duktus (Production) GmbH, Sophienstraße 52 – 54, D-35576 Wetzlar

erklärt, dass die Produkte
declare that the products

Bezeichnung Description	Rohre, Formstücke und Zubehörteile aus duktilem Gusseisen für die Abwasser-Entsorgung Ductile iron pipes, fittings and accessories for sewerage applications
Nennweiten nominal dimension	DN 80-1000

den Bestimmungen der EN 598 entsprechen und die Voraussetzungen für die CE Kennzeichnung gemäß EN 598 erfüllen. Für Handelsware liegt die CE-Konformitätserklärung der Hersteller vor.
comply with the specifications of EN 598 and fulfill the requirements for CE marking according to EN 598.
Merchandise traded: Suppliers´ declarations of CE conformity are available.

Angewandtes Regelwerk: Applied standard	EN 598
Konformitätsbewertung nach: Assessment of conformity according to	EN 598

CE

Die Produkte wurden einer Erstprüfung unterzogen und unterliegen der werkseigenen Produktionskontrolle gemäß EN 598. Jegliche nachträgliche Veränderung an den Produkten, die Auswirkungen auf die technische Ausführung und/oder auf die bestimmungsgemäße Verwendung entsprechend der Betriebsanleitung hat, macht diese Erklärung nichtig.
The products passed the initial type-testing and the manufacturer carries out tests in accordance with EN 598. Any modification of the products which changes the technical layout and/or the field of application as specified in the operating instructions invalidates this declaration.

Ort, Datum Place, date	Stefan Weber
Wetzlar, 11.10.2016	Geschäftsführung Wetzlar Executive board Wetzlar

Vedlegg 8

Certificate of Compliance

This certificate is issued for the following:

DUCTILE IRON PIPE

BLS AND BLS WITH RETAINING RING SIZES 80 THROUGH 400 MM NPS

Prepared for:

Duktus (Wetzlar) GmbH & Co. KG
Sophienstraße 52-54
Wetzlar 35576
Germany

Manufactured at:

Duktus (Production) GmbH
Sophienstraße 52-54
Wetzlar 35576
Germany

FM Approvals Class: 1610

Approval Identification: 0003026057
Revision Request: RR209514

Approval Granted: October 12, 2016
Dated: May 11, 2017

To verify the availability of the Approved product, please refer to www.approvalguide.com

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

David B. Fuller
VP, Manager – Fire Protection
FM Approvals
1151 Boston-Providence Turnpike
Norwood, MA 02062 USA

Member of the FM Global Group

Vedlegg 9

DVGW-Baumusterprüfzertifikat

DVGW type examination certificate

DW-7701BL0610
Registriernummer
registration number

Anwendungsbereich ***field of application***	Produkte der Wasserversorgung *products of water supply*
Zertifikatinhaber ***owner of certificate***	vR production (DUKTUS) gmbh Sophienstraße 52-54, D-35576 Wetzlar
Vertreiber ***distributor***	vonRoll hydro (deutschland) gmbh & co kg Sophienstraße 52 - 54, D-35576 Wetzlar
Produktart ***product category***	Guss- und Stahlrohre für Trinkwasserversorgung: Rohre aus duktilem Gusseisen (7801)
Produktbezeichnung ***product description***	Rohre aus duktilem Gusseisen für die Gas- und Trinkwasserversorgung, DN 40 - DN 600, wahlweise mit Korrosionsschutz "Duktus Zink-PLUS"
Modell ***model***	Gusseisenrohr Duktus DN 40 - DN 600
Prüfberichte ***test reports***	Kontrollprüfung Labor: 1130-700625-22-02-PB vom 24.08.2022 (MPG) Kontrollprüfung Labor: MA 39-22-00858-001 vom 21.04.2022 (MAG) KTW-Prüfung: Z-372277-23-Hy103 vom 05.04.2023 (WHY) KTW-Prüfung: Z-346970-21-Hy103 Rev.01 vom 24.02.2023 (WHY)
Prüfgrundlagen ***test basis***	DVGW GW 337-P (01.09.2010) DIN EN 545 (01.09.2011) DVGW W 347 (01.04.2006) DVGW W 348 (01.09.2004) UBA KTW-BWGL (07.03.2022) UBA ELASTOM (16.03.2016) DVGW W 270 (01.11.2007)
Ablaufdatum / AZ ***date of expiry / file no.***	05.12.2027 / 21-0347-WNV

25.04.2023 Gri A-1/2
Datum, Bearbeiter, Blatt, Leiter der Zertifizierungsstelle
date, issued by, sheet, head of certification body

DAkkS
Deutsche
Akkreditierungsstelle
D-ZE-16028-01-05

DVGW CERT GmbH
Zertifizierungsstelle
Josef-Wirmer-Str. 1-3
53123 Bonn
Tel. +49 228 91 88 - 888
Fax +49 228 91 88 - 993
www.dvgw-cert.com
info@dvgw-cert.com

Typ ***type***	**Technische Daten** ***technical data***	**Bemerkungen** ***remarks***
Gusseisenrohr Duktus	Fertigungsgruppe: DN 40 - DN 250	
Gusseisenrohr Duktus	Fertigungsgruppe: DN 300 - DN 600	

Ausführungsvariante ***type variation***	**Erläuterungen** ***explanations***
TYTON	Steckmuffenverbindung, Nennweiten: DN 80 bis DN 600
TYTON-TIS-K	Steckmuffenverbindung, Nennweiten: DN 100 bis DN 400
TYTON-SIT	Steckmuffenverbindung, Nennweiten: DN 80 bis DN 400
TYTON-NOVO-SIT	Steckmuffenverbindung, Nennweiten: DN 100 bis DN 600
VRS	Steckmuffenverbindung, Nennweiten: DN 80 bis DN 500
Flanschrohre	Rohre mit aufgeschraubten Flanschen, Nennweiten: DN 80 bis DN 600
BLS	Steckmuffenverbindung, Nennweiten: DN 80 bis DN 600
BRS	Steckmuffenverbindung, Nennweiten: DN 80 bis DN 600

Verwendungshinweise / Bemerkungen
hints of utilization / remarks

Muffenrohre:
Auskleidung (innen):
Zementmörtelauskleidung nach DIN EN 545
Polyurethan-Auskleidung nach DIN EN 15655-1

Beschichtung (außen):
Zinküberzug mit Deckbeschichtung
Zink-Aluminium-Überzug aus Zink-Aluminium-Legierung mit oder ohne andere Metalle mit Deckbeschichtung
Zementmörtelumhüllung nach DIN EN 15542

Flanschrohre:
Auskleidung (innen):
Zementmörtelauskleidung nach DIN EN 545

Beschichtung (außen):
Zinküberzug mit Deckbeschichtung (Kunstharz oder Bitumen)
Zink-Aluminium-Überzug aus Zink-Aluminium-Legierung mit oder ohne andere Metalle mit Deckbeschichtung

Vedlegg 10

DVGW-Baumusterprüfzertifikat

DVGW type examination certificate

DW-7701BL0615
Registriernummer
registration number

Anwendungsbereich ***field of application***	Produkte der Wasserversorgung *products of water supply*
Zertifikatinhaber ***owner of certificate***	vR production (DUKTUS) gmbh Sophienstraße 52-54, D-35576 Wetzlar
Vertreiber ***distributor***	vonRoll hydro (deutschland) gmbh & co kg Sophienstraße 52 - 54, D-35576 Wetzlar
Produktart ***product category***	Guss- und Stahlrohre für Trinkwasserversorgung: Rohre aus duktilem Gusseisen (7801)
Produktbezeichnung ***product description***	Rohre aus duktilem Gusseisen für die Trinkwasserversorgung, DN 700 - DN 1000, wahlweise mit Korrosionsschutz "Duktus Zink-PLUS"
Modell ***model***	Gusseisenrohr Duktus DN 700 - DN 1000
Prüfberichte ***test reports***	Kontrollprüfung Labor: 1130-700625-22-02-PB vom 24.08.2022 (MPG) Kontrollprüfung Labor: MA 39-22-00858-001 vom 21.04.2022 (MAG) KTW-Prüfung: Z-372277-23-Hy103 vom 05.04.2023 (WHY) KTW-Prüfung: Z-346970-21-Hy103 Rev.01 vom 24.02.2023 (WHY)
Prüfgrundlagen ***test basis***	DVGW GW 337-P (01.09.2010) DIN EN 545 (01.09.2011) DVGW W 347 (01.04.2006) DVGW W 348 (01.09.2004) UBA KTW-BWGL (07.03.2022) UBA ELASTOM (16.03.2016) DVGW W 270 (01.11.2007)
Ablaufdatum / AZ ***date of expiry / file no.***	05.12.2027 / 21-0347-WNV

25.04.2023 Gri A-1/2
Datum, Bearbeiter, Blatt, Leiter der Zertifizierungsstelle
date, issued by, sheet, head of certification body

DAkkS
Deutsche
Akkreditierungsstelle
D-ZE-16028-01-05

DVGW CERT GmbH
Zertifizierungsstelle
Josef-Wirmer-Str. 1-3
53123 Bonn
Tel. +49 228 91 88 - 888
Fax +49 228 91 88 - 993
www.dvgw-cert.com
info@dvgw-cert.com

Typ ***type***	**Technische Daten** ***technical data***	**Bemerkungen** ***remarks***
Gusseisenrohr Duktus	Fertigungsgruppe: DN 700 - DN 1000	

Ausführungsvariante ***type variation***	**Erläuterungen** ***explanations***
TYTON	Steckmuffenverbindung, Nennweiten: DN 700 bis DN 1000
TYTON-NOVO-SIT	Steckmuffenverbindung, Nennweiten: DN 700
BLS	Steckmuffenverbindung, Nennweiten: DN 700 bis DN 1000

Verwendungshinweise / Bemerkungen
hints of utilization / remarks

Muffenrohre:
Auskleidung (innen):
Zementmörtelauskleidung nach DIN EN 545
Polyurethan-Auskleidung nach DIN EN 15655-1

Beschichtung (außen):
Zinküberzug mit Deckbeschichtung
Zink-Aluminium-Überzug aus Zink-Aluminium-Legierung mit oder ohne andere Metalle mit Deckbeschichtung
Zementmörtelumhüllung nach DIN EN 15542

Flanschrohre:
Auskleidung (innen):
Zementmörtelauskleidung nach DIN EN 545

Beschichtung (außen):
Zinküberzug mit Deckbeschichtung
Zink-Aluminium-Überzug aus Zink-Aluminium-Legierung mit oder ohne andere Metalle mit Deckbeschichtung

Vedlegg 11

Magistrat der Stadt Wien
Magistratsabteilung 39
Prüf-, Überwachungs- und
Zertifizierungsstelle der Stadt Wien
VFA – Labors für Bautechnik
Standort: Rinnböckstraße 15
1110 WIEN
Tel.: (+43 1) 79514-8039
Fax: (+43 1) 79514-99-8039
E-Mail: post@ma39.wien.gv.at
Homepage: www.ma39.wien.at

Duktus (Production) GmbH
Sophienstraße 52-54
35576 Wetzlar
Deutschland

MA 39 – VFA 2018-0162.03

Wien, 16. April 2018

Bescheinigung
über
Fremdüberwachung 2018

Auftraggeber und Herstellwerk : Duktus (Production) GmbH
D-35576 Wetzlar

Inspektionsgegenstand: Rohre und Formstücke aus duktilem Gusseisen für die Wasserversorgung, Ausführungsvarianten: TYTON, TYTON-TIS-K, TYTON-SIT, TYTON-NOVO-SIT, VRS, BLS, BRS und Flansch Nennweiten DN 80 bis DN 1000

Datum der Inspektion: 20. Februar 2018

Inspektionsprogramm: Fremdüberwachung
gemäß DIN EN 545 bzw. ISO 2531 und DVGW GW 337
auf Basis des Überwachungsvertrages MA 39 – ROR – Ü 1436/2013:

- Inspektion des Fertigungsprozesses
- Überprüfung werkseigenen Produktionskontrolle
- Produktprüfungen

Inspektionsergebnis: Sowohl die werkseigene Produktionskontrolle, als auch die Prüfergebnisse erreichen die Anforderungen gemäß DIN EN 545 bzw. ISO 2531 und DVGW GW 337

Der Sachbearbeiter:	Der Laboratoriumsleiter:	Der Leiter der Prüf-, Überwachungs- und Zertifizierungsstelle:
Ing. Wilfried Zankl	Dipl.Ing. Andreas Tichy Oberstadtbaurat	Dipl.-Ing. Georg Pommer Senatsrat

Die Inspektion, sowie die Prüfungen und deren Ergebnisse sind im Inspektionsbericht MA 39 – VFA 2018-0162.01 dokumentiert.

Municipality of Vienna
MUNICIPAL DEPARTMENT 39
Testing; inspection and certification body
of the City of Vienna
VFA – Construction Technology Labs
Address: Rinnböckstrasse 15
A-1110 Vienna
Tel.: (+43 1) 79514-8039
Fax: (+43 1) 79514-99-8039
E-Mail: post@ma39.wien.gv.at
Homepage: www.ma39.wien.at

Duktus (Production) GmbH
Sophienstraße 52-54
35576 Wetzlar
Deutschland

MA 39 – VFA 2018-0162.05

Vienna, 16. April 2018

Attestation
of
Inspection 2018

Applicant and production plant :	Duktus (Production) GmbH D-35576 Wetzlar
Object of inspection:	Ductile iron pipes and fittings for water pipelines, type variation: TYTON, TYTON-TIS-K, TYTON-SIT, TYTON-NOVO-SIT, VRS, BLS, BRS and flange nominal size DN 80 to DN 1000
Date of Inspection:	20 February 2018
Inspection program:	third party inspection according to ISO 2531, DIN EN 545 and DVGW GW 337 based on the inspection contract MA 39 – ROR – Ü 1436/2013: - Inspection of the production process - Inspection of the factory production control - Testing of products
Result of the inspection:	The factory production control as well as the test results comply with the requirements according to ISO 2531, DIN EN 545 and DVGW GW 337

The official:	The head of the laboratory:	The head of testing, inspection and certification body:
Ing. Wilfried Zankl	Dipl.Ing. Andreas Tichy	Dipl.-Ing. Georg Pommer

Prüf-, Überwachungs- und Zertifizierungsstelle Magistratsabteilung 39 * Stadt Wien

The inspection plus the performed tests and their results are documented in the inspection report MA 39 – VFA 2018-0162.01. In any case of doubt the attestation MA 39 – VFA 2018-0162.03 in German language is binding.

Vedlegg 12

ETOKAT Rohrlack TW

(formally ICOSIT® Rohrlack TW 3)

Epoxy Topcoat

Technical data sheet no. 601.3 **July 2011-V3**

1. DESCRITION

ETOKAT Rohrlack TW is a 2-pack solvent less topcoat based on epoxy resins.
With ETOKAT Rohrlack TW layers up to 150µm are possible with one application.
It is very efficient due to the high solid and low solvent content.

Cured coatings are physiologically uncritical.

1.1 Field off application

Easy to apply thick-film system for the coating of cast iron tubes and equipment parts, e.g. armatures, fittings, etc.
ETOKAT Rohrlack TW complies to the UBA-guideline for epoxy coatings in contact with drinking water for cold and moderately hot water (60°C)
Certificate is available.

Ask for technical advice!

1.2 Product range

ETOKAT Rohrlack TW	
Ca. RAL 5015	601.3.8.8375
Red-brown	601.3.6.0002
Black	601.3.2.0001
Hardener TW	855.0.0.1505
Hardener TW 5:1	855.0.0.1515
Hardener HS 4:1	855.0.0.1517
Thinner 1	990.0.0.1501
Thinner 4	990.0.0.1506

1.3 Packaging

ETOKAT Rohrlack TW (Komp. A):	**250 kg** Drum and **1000 kg** Container
ETOKAT Rohrlack TW (Komp. B)	**285 kg** Drum and **1150 kg** Container
Thinner 1/4:	**3 l**, **10 l**, **25 l** and **180 l**

Walter Mäder AG
Bereich Lacke
Industriestraße 1
CH-8956 Killwangen

Tel +41 56 417 81 11
Fax +41 56 401 64 65
nach
mail@maederlacke.ch
www.maederlacke.ch

Mäder Aqualack AG
Verwaltung
Gewerbepark 40
D-59069 Hamm

Tel +49 (0)2385 93 56 0
Fax +49 (0)2385 93 56 49

info@maeder-aqualack.de
www.maeder-aqualack.de

Mäder Lacke
Mäder

Unternehmen zertifiziert

DIN EN ISO 9001 : 2008
DIN EN ISO 14001 : 2005

ETOKAT Rohrlack TW

(formally ICOSIT® Rohrlack TW 3)

Epoxy Topcoat

Technical data sheet no. 601.3 **July 2011-V3**

2. SPEZIFICATION

Mixing ratio weight	
Hardener TW	2,5 : 1
Hardener TW 5:1	5 : 1
Hardener HS 4:1	4 : 1
Recommended temp. for application (determine by trials)	Min. + 20°C
Pot-life (20°C)	ca. 1 ½ Std
Solid content (with hardener TW)	
Weight %	ca. 85%
Volume %	ca. 74 %
Density (20°C)	ca. 1,5 kg/l
Storeability (20°C) in sealed unopened containers, cool and dry	12 Month
Consumption (without sprayloss) per m^2 at 100 µm dry film	ca. 200 g

Drying grade DIN 53150	**Dry film**	**+ 15°C**	**+ 20°C**	**+ 60°C**	**+ 80°C**
6	100 µm	12 Std.	6 Std.	20 min.	10 min.

3. APPLICATION

All used equipments, sealing and other parts must be resistant against xylole and alcohols.

Hardener TW 5:1
The use of hardener TW 5:1 make brush and roll application easier. For spraying you can add thinner 4 990.0.0.1506 up to 5%.
The use of hardener TW 5:1 leads to more stable gloss grades and different application temperatures.

Hardener HS 4:1
The use of hardener HS 4:1 gives more stability for the wet film. At higher thicknesses make sure that drying is complete.

Airless-Spraying:
ETOKAT Rohrlack TW is ready to use.
Typical nozzles: 0,38- 0,58 mm with an angle of 40° - 80°

Application with 2K-Systems:
Both components are ready to use. Stir well both components with a mixer short before application. Than connect to the 2-K system and adjust the mixing ratio as recommended.

When working directly out of the container make sure that both components are constatly stired at a material temperature of about 20°C to ensure a homogenous consistence. We recommend a pre-heating of the material. The material temperature has a significant influence to the viscosity and

Walter Mäder AG
Bereich Lacke
Industriestraße 1
CH-8956 Killwangen

Tel +41 56 417 81 11
Fax +41 56 401 64 65
nach
mail@maederlacke.ch
www.maederlacke.ch

Mäder Aqualack AG
Verwaltung
Gewerbepark 40
D-59069 Hamm

Tel +49 (0)2385 93 56 0
Fax +49 (0)2385 93 56 49

info@maeder-aqualack.de
www.maeder-aqualack.de

Mäder Lacke
Mäder

Unternehmen zertifiziert

DIN EN ISO 9001 : 2008
DIN EN ISO 14001 : 2005

spray optic.

Latest after a downtime of 30 min (at 20°C) you must clean the mixing tube with thinner 1.

3.2 Temperature

Material:
Minimum + 20°C.
The optimum application temperature must be found out by trials.
Coating surface:
Minimum + 20°C

3.3 Notice

Stir well both components.
For the Application with a 1K system mix both components with an electrical mixer (min. 3 minutes). Make sure to reach the material at the bottom and the edges. We recommend a decanting in a new box and a new mixing. Be aware of streaks in the meaning of wrong mixing.
ETOKAT Rohrlack TW is not allowed to be mixed with other coatings.

3.4 Precaution

The regulations of the Health and Safety at Work Act are to be observed.

3.5 End drying time

7 days at 20°C and good ventilation.

For a later contact with drinking water please note:
After application a forced drying with min. 30°C is necessary. Afterwards the objects should be stored for min 14 day in good ventilated rooms.

After such treatment you get a 100% solvent free coating.

Due to misuse and/or insufficient end drying a contamination/inedibility oft he drinking water with solvents is possible.
Before a start-up of parts please follow the guidelines of the DVGW for cleaning and sterilisation as well as the regulations oft the drinking water ordinance.

3.6 Cleaning of equipment

Immediately after work with thinner 1 **990.0.0.1501**.

4. APPLICATION ADVICE

The following recommendations are guidelines and examples. Individual procedures might differ.

4.1 Substrates

- Cast iron
- Zinc plated cast iron
- Zinc coated cast iron

1 x ETOKAT Rohrlack TW

4.2 Pre-treatment

The surfaces shall be free from dust, dirt, corrosion products, oil, fat and alikes.
We recommend blasting to SA 2 1/2 .

5. RESISTANCE

Chemical resistance:

ETOKAT Rohrlack TW is resitant against fresh and waste water, neutral salts and desinfectants.
A longer exposure to solvents has a negative influence to the resistance.

Temperatur:

Dry heat up to approx. + 100°C
Warm water up to approx. + 60°C

Safety notice:

The above mentioned products are for commercial use only. Users must have knowledge about handling and safety at work.
For storage and handling please observe legal regulations and warning notes as well as the material safety data sheet.

Vedlegg 13

1 Identification of the substance/preparation and of the company/undertaking

· **Product details**

· **Trade name:** ***Etokat Rohrlack TW ca. RAL 5015***

· **Article number:** 601388375
· **Application of the substance / the preparation** Coating

· **Manufacturer/Supplier:**
Walter Mäder Aqualack GmbH
Gewerbepark 40
D-59069 Hamm
Tel.: 02385 / 93 56 0
Fax: 02385 / 93 56 49

· **Further information obtainable from:**
Abteilung Produktsicherheit
info@maeder-aqualack.de
· **Information in case of emergency:** Erste-Hilfe-Maßnahmen: Giftzentrale Bonn, Tel.: +49 228 - 2873211

2 Hazards identification

· **Hazard description:**

Xn Harmful
N Dangerous for the environment

· **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
R 10 Flammable.
R 20/21 Harmful by inhalation and in contact with skin.
R 36/38 Irritating to eyes and skin.
R 43 May cause sensitisation by skin contact.
R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Contains epoxy constituents. See information supplied by the manufacturer.
Restricted to professional users.
· **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

3 Composition/information on ingredients

· **Chemical characterization**
· **Description:** Mixture of substances listed below with nonhazardous additions.

· **Dangerous components:**		
CAS: 25068-38-6 NLP: 500-033-5	reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700) Xi, N; R 36/38-43-51/53	25-50%
CAS: 1330-20-7 EINECS: 215-535-7	xylene Xn, Xi; R 10-20/21-38	10-25%
CAS: 100-41-4 EINECS: 202-849-4	ethylbenzene Xn, F; R 11-20	≤ 2.5%

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

(Contd. on page 2)

Trade name: *Etokat Rohrlack TW ca. RAL 5015*

(Contd. of page 1)

4 First aid measures

· **General information:**
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air and to be sure call for a doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.

5 Fire-fighting measures

· **Suitable extinguishing agents:** CO2, sand, extinguishing powder. Do not use water.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Person-related safety precautions:** Wear protective equipment. Keep unprotected persons away.
· **Measures for environmental protection:**
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
· **Measures for cleaning/collecting:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents

7 Handling and storage

· **Handling:**
· **Information for safe handling:**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about fire - and explosion protection:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep container tightly sealed.

8 Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see item 7.

(Contd. on page 3)

Trade name: *Etokat Rohrlack TW ca. RAL 5015*

(Contd. of page 2)

· **Ingredients with limit values that require monitoring at the workplace:**	
1330-20-7 xylene	
WEL ()	Short-term value: 441 mg/m³, 100 ppm Long-term value: 220 mg/m³, 50 ppm Sk; BMGV
100-41-4 ethylbenzene	
WEL ()	Short-term value: 552 mg/m³, 125 ppm Long-term value: 441 mg/m³, 100 ppm

· **Additional information:** The lists valid during the making were used as basis.

· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
· **Respiratory protection:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
· **Protection of hands:**


Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**


Tightly sealed goggles

9 Physical and chemical properties

· **General Information**	
Form:	Fluid
Colour:	According to product specification
Odour:	Characteristic
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100℃
· **Flash point:**	24℃

(Contd. on page 4)

Trade name: *Etokat Rohrlack TW ca. RAL 5015*

(Contd. of page 3)

· **Ignition temperature:**	500℃
· **Self-igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.
· **Explosion limits:**	
Lower:	1.1 Vol %
Upper:	7.0 Vol %
· **Vapour pressure at 20℃:**	6.7 hPa
· **Density at 20℃:**	1.51 g/cm³
· **Solubility in / Miscibility with water:**	Not miscible or difficult to mix.
· **Viscosity:**	
Dynamic at 20℃:	750 mPas
· **Solvent content:**	
Organic solvents:	18.1 %
VOC (EC)	18.07 %
· **Solids content:**	77.5 %

10 Stability and reactivity

· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
· **Dangerous reactions** No dangerous reactions known.
· **Dangerous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Acute toxicity:**

· **LD/LC50 values relevant for classification:**		
1330-20-7 xylene		
Oral	LD50	4300 mg/kg (rat)
Dermal	LD50	2000 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Harmful
Irritant
· **Sensitisation** May cause sensitisation by skin contact.

12 Ecological information

· **Ecotoxical effects:**
· **Remark:** Toxic for fish

(Contd. on page 5)

Trade name: *Etokat Rohrlack TW ca. RAL 5015*

(Contd. of page 4)

· **General notes:**
Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
Also poisonous for fish and plankton in water bodies.
Toxic for aquatic organisms

13 Disposal considerations

· **Product:**
· **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packaging:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **Land transport ADR/RID (cross-border)**
· **ADR/RID class:** -

· **Maritime transport IMDG:**

· **IMDG Class:** 3
· **UN Number:** 1263
· **Label** 3
· **Packaging group:** III
· **EMS Number:** F-E,S-E
· **Marine pollutant:** No
· **Proper shipping name:** PAINT RELATED MATERIAL

· **Air transport ICAO-TI and IATA-DGR:**

· **ICAO/IATA Class:** 3
· **UN/ID Number:** 1263
· **Label** 3
· **Packaging group:** III
· **Proper shipping name:** PAINT RELATED MATERIAL

15 Regulatory information

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials.

· **Code letter and hazard designation of product:**

Xn Harmful
N Dangerous for the environment

(Contd. on page 6)

Trade name: *Etokat Rohrlack TW ca. RAL 5015*

(Contd. of page 5)

· **Hazard-determining components of labelling:**
reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700)
xylene

· **Risk phrases:**
10 Flammable.
20/21 Harmful by inhalation and in contact with skin.
36/38 Irritating to eyes and skin.
43 May cause sensitisation by skin contact.
51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Safety phrases:**
9 Keep container in a well-ventilated place.
23 Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
57 Use appropriate container to avoid environmental contamination.

· **Special labelling of certain preparations:**
Contains epoxy constituents. See information supplied by the manufacturer.
Restricted to professional users.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant R-phrases**
10 Flammable.
11 Highly flammable.
20 Harmful by inhalation.
20/21 Harmful by inhalation and in contact with skin.
36/38 Irritating to eyes and skin.
38 Irritating to skin.
43 May cause sensitisation by skin contact.
51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Department issuing MSDS:** Abteilung Produktsicherheit
· **Contact:** Hr. Piszczek

Vedlegg 14

1 Identification of the substance/preparation and of the company/undertaking

· **Product details**

· **Trade name:** ***Härter für Etokat Rohrlack TW (NV)***

· **Article number:** 855001505
· **Application of the substance / the preparation**
Hardening agent/ Curing agent
Not determined

· **Manufacturer/Supplier:**
Walter Mäder Aqualack GmbH
Gewerbepark 40
D-59069 Hamm
Tel.: 02385 / 93 56 0
Fax: 02385 / 93 56 49

· **Further information obtainable from:**
Abteilung Produktsicherheit
info@maeder-aqualack.de
· **Information in case of emergency:** Erste-Hilfe-Maßnahmen: Giftzentrale Bonn, Tel.: +49 228 - 2873211

2 Hazards identification

· **Hazard description:**


Xn Harmful

· **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
R 38 Irritating to skin.
R 41 Risk of serious damage to eyes.
R 42/43 May cause sensitisation by inhalation and skin contact.
Restricted to professional users.
· **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

3 Composition/information on ingredients

· **Chemical characterization**
· **Description:** Mixture of substances listed below with nonhazardous additions.

· **Dangerous components:**

CAS: 71-36-3 EINECS: 200-751-6	butan-1-ol	Xn, Xi; R 10-22-37/38-41-67	2.5-10%
CAS: 1330-20-7 EINECS: 215-535-7	xylene	Xn, Xi; R 10-20/21-38	2.5-10%
CAS: 107-15-3 EINECS: 203-468-6	ethylenediamine	C, Xn; R 10-21/22-34-42/43	≤ 2.5%

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First aid measures

· **General information:**
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

(Contd. on page 2)

Trade name: *Härter für Etokat Rohrlack TW (NV)*

(Contd. of page 1)

· **After inhalation:**
Supply fresh air and to be sure call for a doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
· **After swallowing:** Call for a doctor immediately.

5 Fire-fighting measures

· **Suitable extinguishing agents:**
CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

· **Person-related safety precautions:** Not required.
· **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.
· **Measures for cleaning/collecting:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.

7 Handling and storage

· **Handling:**
· **Information for safe handling:**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about fire - and explosion protection:** No special measures required.

· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep container tightly sealed.

8 Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see item 7.

· **Ingredients with limit values that require monitoring at the workplace:**	
71-36-3 butan-1-ol	
WEL ()	Short-term value: 154 mg/m³, 50 ppm Sk
1330-20-7 xylene	
WEL ()	Short-term value: 441 mg/m³, 100 ppm Long-term value: 220 mg/m³, 50 ppm Sk; BMGV

· **Additional information:** The lists valid during the making were used as basis.

· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Avoid contact with the skin.

(Contd. on page 3)

Trade name: *Härter für Etokat Rohrlack TW (NV)*

(Contd. of page 2)

Avoid contact with the eyes and skin.

· **Respiratory protection:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.

· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**

Tightly sealed goggles

9 Physical and chemical properties

· **General Information**	
Form:	Fluid
Colour:	According to product specification
Odour:	Characteristic
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	116℃
· **Flash point:**	24℃
· **Ignition temperature:**	340℃
· **Self-igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Density at 20℃:**	1.5 g/cm³
· **Solubility in / Miscibility with water:**	Not miscible or difficult to mix.
· **Viscosity:**	
Dynamic at 20℃:	3000 mPas
· **Solvent content:**	
Organic solvents:	18.6 %
VOC (EC)	18.60 %

(Contd. on page 4)

Trade name: *Härter für Etokat Rohrlack TW (NV)*

(Contd. of page 3)

· **Solids content:** 51.0 %

10 Stability and reactivity

· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
· **Dangerous reactions** No dangerous reactions known.
· **Dangerous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Acute toxicity:**

· **LD/LC50 values relevant for classification:**		
1330-20-7 xylene		
Oral	LD50	4300 mg/kg (rat)
Dermal	LD50	2000 mg/kg (rabbit)
107-15-3 ethylenediamine		
Oral	LD50	500 mg/kg (rat)
Dermal	LD50	730 mg/kg (rabbit)
Inhalative	LC50/4 h	0.3 mg/l (mouse)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Strong irritant with the danger of severe eye injury.
· **Sensitization:**
Sensitization possible through inhalation.
Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Harmful
Irritant
· **Sensitisation** May cause sensitisation by inhalation and skin contact.

12 Ecological information

· **General notes:**
Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.

13 Disposal considerations

· **Product:**
· **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
· **Uncleaned packaging:**
· **Recommendation:** Disposal must be made according to official regulations.

(Contd. on page 5)

Trade name: *Härter für Etokat Rohrlack TW (NV)*

(Contd. of page 4)

14 Transport information

· **Land transport ADR/RID (cross-border)**
· **ADR/RID class:** -

· **Maritime transport IMDG:**
· **IMDG Class:** -
· **Marine pollutant:** No

· **Air transport ICAO-TI and IATA-DGR:**

· **ICAO/IATA Class:** 3
· **UN/ID Number:** 1263
· **Label** 3
· **Packaging group:** III
· **Proper shipping name:** PAINT RELATED MATERIAL

15 Regulatory information

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials.

· **Code letter and hazard designation of product:**

Xn Harmful

· **Hazard-determining components of labelling:**
ethylenediamine

· **Risk phrases:**
20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
38 Irritating to skin.
41 Risk of serious damage to eyes.
42/43 May cause sensitisation by inhalation and skin contact.

· **Safety phrases:**
23 Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
60 This material and its container must be disposed of as hazardous waste.

· **Special labelling of certain preparations:**
Restricted to professional users.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant R-phrases**
10 Flammable.
20/21 Harmful by inhalation and in contact with skin.

(Contd. on page 6)

Trade name: *Härter für Etokat Rohrlack TW (NV)*

(Contd. of page 5)

21/22 Harmful in contact with skin and if swallowed.
22 Harmful if swallowed.
34 Causes burns.
37/38 Irritating to respiratory system and skin.
38 Irritating to skin.
41 Risk of serious damage to eyes.
42/43 May cause sensitisation by inhalation and skin contact.
67 Vapours may cause drowsiness and dizziness.

· **Department issuing MSDS:** Abteilung Produktsicherheit
· **Contact:** Hr. Piszczek

Vedlegg 15

Safety Data Sheet
according to Regulation (EC) No. 1907/2006 (REACH)
according to Regulation (EU) No 453/2010

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. **Product identifiers**

Article No. (manufacturer/supplier):	3506809
Identification of the substance or mixture	Grossol-Muffenlack RAL 5017 verkehrsblau KTW-Zulassung

1.2. **Relevant identified uses of the substance or mixture and uses advised against**

Relevant identified uses
One-pack paint

1.3. **Details of the supplier of the safety data sheet**

supplier (manufacturer/importer/downstream user/distributor)

Gross & Perthun GmbH & Co. KG
Industriestr. 12-14
D-68169 Mannheim

Telephone: +49 (621) 330920
Telefax: +49 (621) 3309228
homepage: www.gross-perthun.de

Dept. responsible for information:

E-mail (competent person): u.hirmann@gross-perthun.de

1.4. **Emergency telephone number**

GBK GmbH Global Regulatory Compliance (Contract ID: 100445)
Advising in German and English: +49 (6132) 9829021

SECTION 2: Hazards identification

2.1. **Classification of the substance or mixture**

Classification according to Directive 67/548/EEC or 1999/45/EC

This mixture is classified as hazardous according to 1999/45/EC.

R10		Flammable
Xi; R36/37/38	Irritant	Irritating to eyes, respiratory system and skin.
Xn; R48/20/21	Harmful	Harmful: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.
N; R51-53	Dangerous for the environment	Toxic to aquatic life. May cause long-term adverse effects in the aquatic environment.

2.2. **Label elements**

The product is classified and labelled according to EC directives or corresponding national laws.

Labelling (67/548/EEC or 1999/45/EC)

Xn Harmful

N Dangerous for the environment

Hazard statements

10	Flammable
36/37/38	Irritating to eyes, respiratory system and skin.
48/20/21	Harmful: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.
51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Precautionary statements

26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37	Wear suitable protective clothing and gloves.
38	In case of insufficient ventilation, wear suitable respiratory equipment.
51	Use only in well-ventilated areas.
61	Avoid release to the environment. Refer to special instructions/safety data sheet.
23	Do not breathe vapour.

contains:

xylene, mixture of isomers

Special provisions concerning the labelling of certain mixtures
n.a.

2.3. **Other hazards**

SECTION 3: Composition / information on ingredients

3.2. **Mixtures**

Product description / chemical characterization

Description Preparation of synthetic polymers, solvents, pigments and fillers

Hazardous ingredients

Classification according to Regulation (EC) No. 1272/2008 [CLP]

EC No. CAS No. INDEX No.	REACH No. Chemical name classification:	Wt % Remark
215-535-7 1330-20-7	01-2119486136-34 xylene, mixture of isomers Flam. Liq. 3 H226 / Acute Tox. 4 H312 / Acute Tox. 4 H332 / Skin Irrit. 2 H315 / Eye Irrit. 2 H319 / Asp. Tox. 1 H304 / STOT RE 2 H373 / STOT SE 3 H335	25 - 50
231-944-3 7779-90-0 030-011-00-6	01-2119485044-40 trizinc bis(orthophosphate) Aquatic Acute 1 H400 / Aquatic Chronic 1 H410	5 - 10
202-849-4 100-41-4	01-2119489370-35 ethylbenzene Flam. Liq. 2 H225 / Acute Tox. 4 H332 / Asp. Tox. 1 H304	5 - 10
215-222-5 1314-13-2 030-013-00-7	01-2119463881-32 zinc oxide Aquatic Acute 1 H400 / Aquatic Chronic 1 H410	< 0,5

Classification according to Directive 67/548/EEC or 1999/45/EC

EC No. CAS No. INDEX No.	REACH No. Chemical name classification:	Wt % Remark
215-535-7 1330-20-7	01-2119486136-34 xylene, mixture of isomers R10 / Xn; R20/21-48/20-65 / Xi; R36/37/38	25 - 50
231-944-3 7779-90-0 030-011-00-6	01-2119485044-40 trizinc bis(orthophosphate) N; R50-53	5 - 10
202-849-4 100-41-4	01-2119489370-35 ethylbenzene F; R11 / Xn; R20-65	5 - 10
215-222-5 1314-13-2 030-013-00-7	01-2119463881-32 zinc oxide N; R50-53	< 0,5

Additional information
Full text of R-phrases: see section 16.
Full text of H-phrases: see section 16.

SECTION 4: First aid measures

4.1. **Description of first aid measures**

General information

In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness give nothing by mouth, place in recovery position and seek medical advice.

After inhalation

Remove casualty to fresh air and keep warm and at rest. In case of irregular breathing or respiratory arrest provide artificial respiration.

Following skin contact
Remove contaminated, saturated clothing immediately. After contact with skin, wash immediately with plenty of water and soap. Do not use solvents or thinners.

After eye contact
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical advice immediately.

After ingestion
If swallowed, rinse mouth with water (only if the person is conscious). Seek medical advice immediately. Keep victim calm. Do not induce vomiting.

4.2. **Most important symptoms and effects, both acute and delayed**
In all cases of doubt, or when symptoms persist, seek medical advice.

4.3. **Indication of any immediate medical attention and special treatment needed**

SECTION 5: Firefighting measures

5.1. **Extinguishing media**

Suitable extinguishing media
alcohol resistant foam, carbon dioxide, Powder, spray mist, (water)

Extinguishing media which must not be used for safety reasons:
strong water jet

5.2. **Special hazards arising from the substance or mixture**
Dense black smoke occurs during fire. Inhaling hazardous decomposing products can cause serious health damage.

5.3. **Special protective equipment for firefighters:**
Provide a conveniently located respiratory protective device.

Additional information
Cool closed containers that are near the source of the fire. Do not allow water used to extinguish fire to enter drains, ground or waterways. Treat runoff as hazardous.

SECTION 6: Accidental release measures

6.1. **Personal precautions, protective equipment and emergency procedures**
Keep away from sources of ignition. Ventilate affected area. Do not breathe vapours. See protective measures under point 7 and 8.

6.2. **Environmental precautions**
Do not allow to enter into surface water or drains. If the product contaminates lakes, rivers or sewages, inform competent authorities in accordance with local regulations.

6.3. **Methods and material for containment and cleaning up**
Isolate leaked material using non-flammable absorption agent (e.g. sand, earth, vermiculit, diatomaceous earth) and collect it for disposal in appropriate containers in accordance with the local regulations (see chapter 13). Clean using cleansing agents. Do not use solvents.

6.4. **Reference to other sections**
Observe protective provisions (see chapter 7 and 8).

SECTION 7: Handling and storage

7.1. **Precautions for safe handling**

Advices on safe handling

Avoid formation of flammable and explosive vapour concentrations in the air and exceeding the exposure limit values. Only use the material in places where open light, fire and other flammable sources can be kept away. Electrical equipment must be protected meeting the accepted standard. Product may become electrostatically charged. Provide earthing of containers, equipment, pumps and ventilation facilities. Anti-static clothing including shoes are recommended. Floors must be electrically conductive. Keep away from heat sources, sparks and open flames. Use only spark proof tools. Avoid contact with skin, eyes and clothes. Do not inhale dusts, particulates and spray mist when using this preparation. Avoid respiration of swarf. When using do not eat, drink or smoke. Personal protection equipment: refer to chapter 8. Do not empty containers with pressure - no pressure vessel! Always keep in containers that correspond to the material of the original container. Follow the legal protection and safety regulations.

Precautions against fire and explosion:
Vapours are heavier than air. Vapours form explosive mixtures with air.

7.2. **Conditions for safe storage, including any incompatibilities**

Requirements for storage rooms and vessels
Storage in accordance with the Ordinance on Industrial Safety and Health (BetrSiVO). Keep container tightly closed. Do not empty containers with pressure - no pressure vessel! Smoking is forbidden. Access only for authorised persons. Store carefully closed containers upright to prevent any leaks. Soils have to conform to the "Guidelines for avoidance of ignition hazards due to electrostatic charges (BGR 132)".

Hints on joint storage
Keep away from strongly acidic and alkaline materials as well as oxidizers.

Further information on storage conditions
Take care of instructions on label. Store in a well-ventilated and dry room at temperatures between 10 °C and 35 °C. Protect from heat and direct sunlight. Keep container tightly closed. Remove all sources of ignition. Smoking is forbidden. Access only for authorised persons. Store carefully closed containers upright to prevent any leaks.

7.3. **Specific end use(s)**
Observe technical data sheet.Observe instructions for use.

SECTION 8: Exposure controls/personal protection

8.1. **Control parameters**

xylene, mixture of isomers
EC No. 215-535-7 / CAS No. 1330-20-7

WEL, TWA: 220 mg/m3; 50 ppm
WEL, STEL: 441 mg/m3; 100 ppm

BMGV, TWA: 650 ppm
Remark: (methyl hippuric acid/mol creatinine innurine, Post shift)

ethylbenzene
EC No. 202-849-4 / CAS No. 100-41-4

WEL, TWA: 441 mg/m3; 100 ppm
WEL, STEL: 552 mg/m3; 125 ppm
Remark: (SK)

Additional information
TWA : long-term occupational exposure limit value
STEL : short-term occupational exposure limit value
Ceiling : peak limitation

8.2. **Exposure controls**
Provide good ventilation. This can be achieved with local or room suction. If this should not be sufficient to keep aerosol and solvent vapour concentration below the exposure limit values, a suitable respiratory protection must be used.

Occupational exposure controls

Respiratory protection
If concentration of solvents is beyond the occupational exposure limit values, approved and suitable respiratory protection must be used. Observe the wear time limits according GefStoffV in combination with the rules for using respiratory protection apparatus (BGR 190). Use only respiratory protection equipment with CE-symbol including four digit test number.

Dand protection
For prolonged or repeated handling the following glove material must be used: Nitryl rubber or fluoride rubber
Observe the instructions and details for use, storage, maintenance and replacement provided by the protective glove manufacturer. Penetration time of glove material depending on intensity and duration of exposure to skin. Recommended glove articles DIN EN 374 Barrier creams can help protecting exposed skin areas. In no case should they be used after contact.

Eye protection
Wear closely fitting protective glasses in case of splashes.

Protective clothing
Wear antistatic clothing of natural fibers (cotton) or heat resistant synthetic fibers.

Protective measures
After contact clean skin thoroughly with water and soap or use appropriate cleanser.

Environmental exposure controls
Do not allow to enter into surface water or drains. See chapter 7. No additional measures necessary.

SECTION 9: Physical and chemical properties

9.1. **Information on basic physical and chemical properties**

Appearance:

Physical state: liquid

Colour: see commercial name

Odour: characteristic

Safety relevant basis data	Measured values	Unit	Method	Remark
Flash point:	> 23	°C	Abel Pensky	
Ignition temperature in °C:	425	°C	lowest value of prep.	
lower explosion limit:	1,0	Vol-%	Value preparation	
Upper explosion limit:	7,8	Vol-%	Value preparation	
Vapour pressure at 20 °C:	3,08	hPa	calculated.	
Density at 20 °C:	1,140	g/cm³	calculated.	
Water solubility (g/L):	insoluble			
pH value at 20 °C:	-			
Viscosity at 20 °C:	60 s 6 mm		DIN EN ISO 2431	
Solvent separation test (%):	< 3	%		
Solid content (%):	63	Wt %		
solvent content:				
Organic solvents:	37	Wt %		
Water:	0	Wt %		

9.2. **Other information**

SECTION 10: Stability and reactivity

10.1. **Reactivity**

10.2. **Chemical stability**

Stable when applying the recommended regulations for storage and handling. Further information on correct storage: refer to chapter 7.

10.3. **Possibility of hazardous reactions**

Keep away from strong acids, strong bases and strong oxidizing agents to avoid exothermic reactions.

10.4. **Conditions to avoid**

Stable when applying the recommended regulations for storage and handling. Further information on correct storage: refer to chapter 7. Hazardous decomposition byproducts may form with exposure to high temperatures.

10.5. **Incompatible materials**

10.6. **Hazardous decomposition products**

Hazardous decomposition byproducts may form with exposure to high temperatures, e.g.: carbon dioxide, carbon monoxide, smoke, nitrogen oxides.

SECTION 11: Toxicological information

No data on preparation itself available.

11.1. **Information on toxicological effects**

Acute toxicity

Toxicological data are not available.

Irritant and corrosive effects

Toxicological data are not available.

Sensitisation

Toxicological data are not available.

Specific target organ toxicity

Toxicological data are not available.

Aspiration hazard

Toxicological data are not available.

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)

Toxicological data are not available.

Practical experience/human evidence

Other observations:
Inhaling of solvent components above the MWC-value can lead to health damage, e.g. irritation of the mucous membrane and respiratory organs, as well as damage to the liver, kidneys and the central nerve system. Indications for this are: headache, dizziness, fatigue, amyosthenia, dizziness, in serious cases: unconsciousness. Solvents may cause some of the aforementioned effects through skin resorption. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and/or absorption through skin. Splashing may cause eye irritation and reversible damage.

Overall Assessment on CMR properties

The ingredients in this preparation do not meet the criteria for classification as CMR category 1 or 2. according to 67/548/EEC.

There is no information available on the preparation itself . The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and classified according to the toxicological dangers.See chapters 2 and 15 for details.

SECTION 12: Ecological information

overall evaluation
There is no information available on the preparation itself .
Do not allow to enter into surface water or drains.

12.1. **Toxicity**

zinc oxide
Fish toxicity, LC50, Brachydanio rerio (zebra-fish): > 10000 mg/L (96 h)
Algae toxicity, EC50, Selenastrum capricornutum: 0,17 mg/L (72 h)
Daphnia toxicity, EC50, Ceriodaphnia dubia: 0,83 mg/L (48 h)

Long-term Ecotoxicity

Toxicological data are not available.

12.2. **Persistence and degradability**

xylene, mixture of isomers

Biodegradation: > 60 % (28 D)
Methode: OECD 301 F

ethylbenzene
Biodegradation: 70 - 80 % (28 D); evaluation Readily biodegradable (according to OECD criteria).

12.3. **Bioaccumulative potential**

zinc oxide
Distribution coefficient (n-octanol / water) (log P O/W): 2,2

xylene, mixture of isomers

Distribution coefficient (n-octanol / water) (log P O/W): 2,77 - 3,15

Bioconcentration factor (BCF)

Toxicological data are not available.

12.4. **Mobility in soil**
Toxicological data are not available.

12.5. **Results of PBT assessment**

The substances in the mixture do not meet the PBT/vPvB criteria according to REACH, annex XIII.

12.6. **Other adverse effects**

SECTION 13: Disposal considerations

13.1. **Waste treatment methods**

Appropriate disposal / Product

Recommendation
Do not allow to enter into surface water or drains. This material and its container must be disposed of in a safe way. Waste disposal according to EC directives 75/442/EEC and 91/689/EEC in the corresponding versions, covering waste and dangerous waste.

List of proposed waste codes/waste designations in accordance with EWC

080111	waste paint and varnish containing organic solvents or other dangerous substances

packaging
Recommendation
Non-contaminated packages may be recycled. Vessels not properly emptied are special waste.

SECTION 14: Transport information

14.1. **UN number**

1263

14.2. **UN proper shipping name**

Land transport (ADR/RID):	Paint
Sea transport (IMDG):	PAINT
Air transport (ICAO-TI / IATA-DGR):	Paint

14.3. **Transport hazard class(es)**

3

14.4. **Packing group**

III

14.5. **Environmental hazards**

Land transport (ADR/RID)	UMWELTGEFÄHRDEND
Marine pollutant	p / TRIZINKBIS(ORTHOPHOSPHAT)

14.6. **Special precautions for user**

Transport always in closed, upright and safe containers. Make sure that persons transporting the product know what to do in case of an accident or leakage.
Advices on safe handling: see parts 6 - 8

Additional information

Land transport (ADR/RID)

tunnel restriction code	D/E SONDERVORSCHRIFT 640E

Sea transport (IMDG)

EmS-No.	F-E, S-E

14.7. **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

not applicable

SECTION 15: Regulatory information

15.1. **Safety, health and environmental regulations/legislation specific for the substance or mixture**

EU legislation

Information according to 1999/13/EC about limitation of emissions of volatile organic compounds (VOC-guideline).

VOC-value (in g/L) ISO 11890-2:	426,659
VOC-value (in g/L) ASTM D 2369:	426,659

according to EU-regulation 2004/42/EC (appendix II)
EU limit value for this product (cat. not applicable): 0 g/l (2007)/0 g/l (2010).
This product contains max 426,659 g/l VOC.

National regulations

Restrictions of occupation
Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.
Observe restrictions to employment for juvenils according to the "juvenile work protection guideline" (94/33/EC).

Other regulations, restrictions and prohibition regulations

15.2. **Chemical Safety Assessment**

Chemical safety assessments for substances in this preparation were not carried out.

SECTION 16: Other information

Relevant R-and H-phrases (Number and full text):

Flam. Liq. 3 / H226	flammable liquids	Flammable liquid and vapour.
Acute Tox. 4 / H312	Acute toxicity (dermal)	Harmful in contact with skin.
Acute Tox. 4 / H332	Acute toxicity (inhalative)	Harmful if inhaled.
Skin Irrit. 2 / H315	skin corrosion/irritation	Causes skin irritation.
Eye Irrit. 2 / H319	Serious eye damage/eye irritation	Causes serious eye irritation.
Asp. Tox. 1 / H304	Aspiration hazard	May be fatal if swallowed and enters airways.
STOT RE 2 / H373	Specific target organ toxicity (repeated exposure)	May cause damage to organs (or state all organs affected, if known) through prolonged or repeated exposure (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard).
STOT SE 3 / H335	Specific target organ toxicity (single exposure)	May cause respiratory irritation.
Aquatic Acute 1 / H400	Hazardous to the aquatic environment	Very toxic to aquatic life.
Aquatic Chronic 1 / H410	Hazardous to the aquatic environment	Very toxic to aquatic life with long lasting effects.
Flam. Liq. 2 / H225	flammable liquids	Highly flammable liquid and vapour.
N; R50-53	Dangerous for the environment	Very toxic to aquatic life. May cause long-term adverse effects in the aquatic environment.
R10		Flammable
Xn; R20/21-48/20-65	Harmful	Harmful by inhalation and in contact with skin. Harmful: danger of serious damage to health by prolonged exposure through inhalation. Harmful: may cause lung damage if swallowed.
Xi; R36/37/38	Irritant	Irritating to eyes, respiratory system and skin.
F; R11	Highly flammable	Highly flammable
Xn; R20-65	Harmful	Harmful by inhalation. Harmful: may cause lung damage if swallowed. Harmful: may cause lung damage if swallowed.

Additional information

The information supplied on this safety data sheet complies with our current level of knowledge as well as with national and EU regulations. Without written approval, the product must not be used for purposes different from those mentioned in chapter 1. It is always the user''s duty to take any necessary measures for meeting the requirements laid down by local rules and regulations. The details in this safety data sheet describe the safety requirements of our product and are not to be regarded as guaranteed attributes of the product.

n.a. = : not applicable
n.b. = : not determined

Annex

At present, sufficient data / information on exposure scenarios ar e not available, so that an evaluation of the preperation cannot yet be made.