



TANK  
PROTECTION  
SHIELD

**WOLFTANK**  
DEUTSCHLAND

Our partner Woltank Deutschland

# CORROSION AND LEAKS IN THE DOME SHAFT

**KH-PATENTED COLD CASTING PROCESS**

■ OPTIONAL  
PROTECTION

■ NATIONWIDE  
DEPLOYMENT





**TANK  
PROTECTION  
SHIELD**

In nature, the turtle shell is a unique form of protection. Consisting of solid bone plates, it protects all vital organs. Thus equipped, turtles seem to have acquired a very successful survival strategy. But just as a turtle with a damaged shell cannot survive for a long time, neither can a corroded, only temporarily patched dome shaft.



# TANK PROTECTION SHIELD KH-PATENTED SOLUTION.

We started with the repair of liquefied gas containers. We have grown along with the tasks asked of us by our customers. Today, we are a specialist in coating techniques and a specialist company according to WHG.

Our customers – predominantly operators of petrol stations, terminals or oil companies – deal with water-polluting substances on a daily basis and have to meet ever-higher requirements for the liquid density of their systems. However, a large part of the dome and long-distance filling shafts – we observe this almost daily – have considerable overdue maintenance.

Pipelines, but also tank apexes are porous, even corroded up to pitting corrosion; in places anti-freeze liquid already is escaping the damaged area of the tank apex. The holes were provisionally closed with metal filler or similar products. All these sealing attempts are costly and only rarely permanently successful. Generally, they do not meet the current guidelines and requirements according to WHG.

**We were inspired by nature and developed an environmentally friendly and durable solution for water protection, which is patented and approved by DIBt.**

**The dome shaft sealing TANK PROTECTION SHIELD® restores the liquid impermeability of surfaces in facilities for storage, filling, or turn over of water polluting substances.**

**TANK PROTECTION SHIELD is an extremely environmentally friendly and safe repair technology, which we have developed together with our subsidiary M2. It is especially suited for operators of double-walled underground storage tanks, who rely on absolute water protection and operational safety but cannot allow downtime.**

M2 is a specialist for the development, production and marketing of functional paints, corrosion protection systems, additives and special resins, partly from its own production. They supply large-scale industry.

The resin for the patented protective shield originates from M2's laboratory – developed together with experts from the petroleum industry and specialist laboratories. Applied with a carbon fibre fleece, the tank crowns and pipes of your dome shaft receive a high-tech seal of extremely high strength that permanently protects against corrosion and many aggressive liquids – similarly resistant and durable as the intact shell of a turtle.

*Michael Heine, Managing Director  
KH Tank- und Korrosionsschutz e. K.*

# TANK PROTECTION SHIELD THE SAFE PROCEDURE.

Typical products in double-walled underground storage containers are petrol and diesel fuels or heating oil. In the dome shaft area, these containers and their tank apexes are extremely susceptible to corrosion. However, the patented cold seal is equally suitable for storage containers with other, e.g. chemical products.

We carry out the actual sealing process with cold casting resin, which we reinforce with carbon fibre fleece. We play it safe: We seal the entire area of the visible tank top – not just the damaged areas.

## THE BENEFITS

- + No dangerous hot work around the dome shaft is required to seal the monitoring space.
- + Shaft bottom or tank outer jackets receive additional reinforcement and are protected to the maximum extent due to the liquid-tight lamination.
- + The method can also be used to close and reinforce pitting points on the inner shell of the tank.
- + The application saves time and spares your finances.
- + While we are working, your petrol station operation can continue.





## 1 CLEANING

of the dome shaft and removal of water or anti-freeze; blasting the surfaces with dry ice containing an abrasive medium, to remove existing corrosion residue from the metallic surfaces

## 2 SEALING RESIN

Applying the vinyl ester sealing resin on the prepared surface

## 3 CARBON FIBRE FLEECE

Inserting the carbon fabric, saturating the reinforcing material for a homogeneous connection with the substrate, deaerating the laminate

## 4 SEALING RESIN

Applying the second layer of vinyl ester sealing resin on the prepared surface

## 5 COATING

After the laminate has hardened, the entire dome shaft is coated with a liquid-tight, chemical-resistant lining – compliant with the requirements of a liquid-impermeable lining of dome shafts (DWA-A 779)



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**M2**

ENTWICKLUNGS-, PRODUKTIONS-  
& VERTRIEBS-GmbH

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& VERTRIEBS-GmbH

# RENOVATION IN SEVERAL STEPS

1

## EXPOSING ALL VISIBLE DAMAGE POINTS:

Cleaning the dome shaft and removing water or anti-freeze, blasting the surfaces with dry ice (pellets,  $\varnothing = 3 \text{ mm}$ ), containing an abrasive medium (garnet sand, 30/60 mesh) in order to remove existing corrosion residue, in particular from the metallic surfaces. On the cleaned surfaces, we can see all damage points on the outer shell of the tank (or the pipelines).

2

## LAMINATING THE TANK SHEATH AND THE GAS-CARRYING PIPELINES:

Applying the vinyl ester sealing resin (0.5 - 0.6 kg/m<sup>2</sup>) to the prepared surfaces, inserting the carbon fabric (200 g/2, 0.2 mm thickness, filament diameter 7  $\mu\text{m}$ , tensile strength 3,500 MPa) as reinforcing material, saturating the reinforcing material with a laminating roller for a homogeneous connection to the substrate, deaerating the laminate with a disc roller. The lamination covers the entire area of the visible tank apex – not just the damaged areas – and is provided with a circumferential upstand of 10 cm.

3

## SEALING THE TANK COVER:

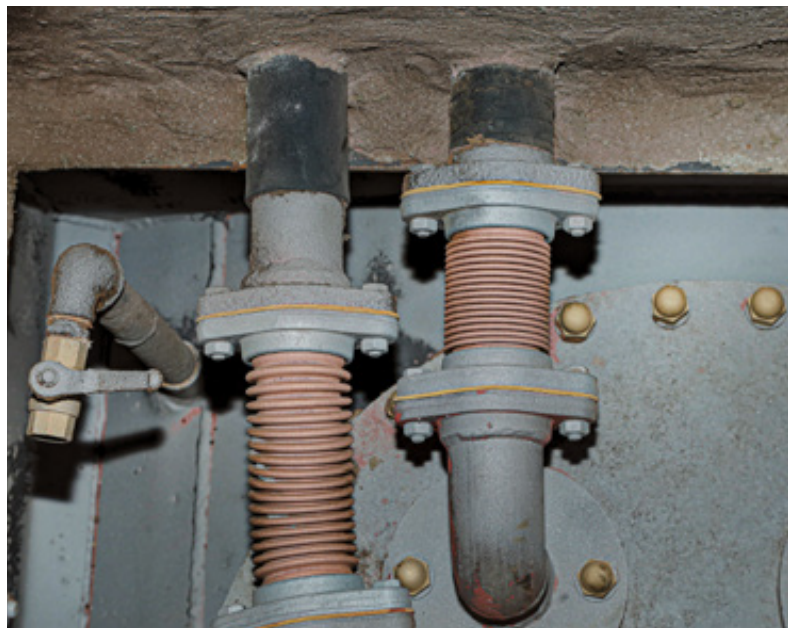
After the laminate has hardened, the entire dome shaft is coated with a liquid-tight, chemical-resistant lining – in compliance with the requirements of a liquid-impermeable lining of dome shafts according to DWA-A 779.

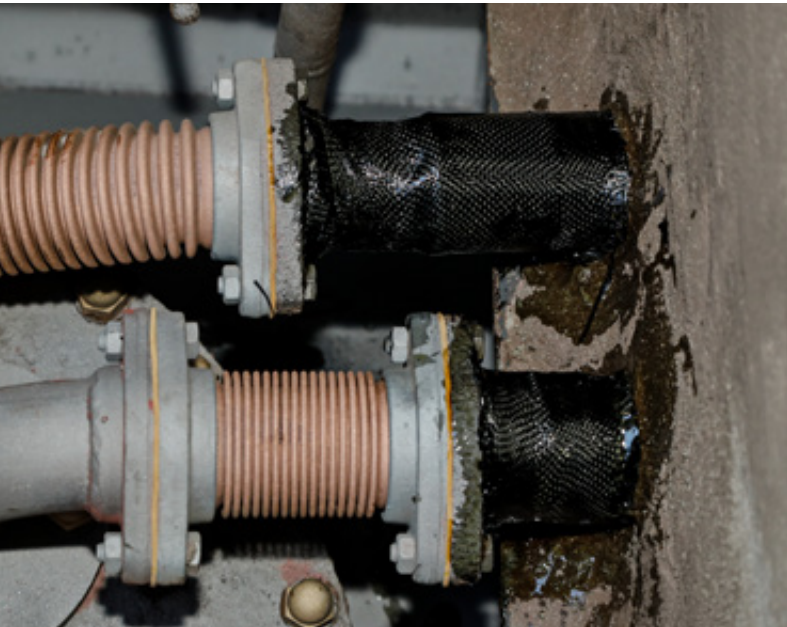






SHAFT BEFORE RENOVATION







# CRITICAL DAMAGE

## DAMAGE AND CONSEQUENCES

### THE DAMAGE

Leakage on the outer wall of a double-walled tank. Anti-freeze liquid is leaking, the leak indicator has an error, the tank is unguarded.

### THE CONSEQUENCES

The expert inspector shuts down the tank. No product delivery is possible until recommissioning.

The leak is located just below the masonry. The soil must be excavated on the outside of the dome shaft, the masonry must be removed to the damaged point on the tank's outer shell. This work must be done carefully and with a very good eye, to avoid further damage to the outer shell.

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You can avoid such damage and the associated downtime of your operation with regular service.

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In terms of quality, cost and timeframe, this process is unequalled: we started excavating the earth on Monday. Two days later, the tank could be put back into operation! And this at a manageable cost.



Our methods and procedures are adjusted to the exact conditions on site.

## PLANNING & COORDINATION

- + Expert discussion of the construction project: We address all details and possibilities and explain them so the customer fully understands each of our work steps.
- + Planning according to HSSE guidelines: We discuss all activities in advance with the filling station operator, to ensure health, safety, security and environmental protection in the working environment.
- + Situation meeting / coordination with external companies & subcontractors: The timeframe and preparation of the individual work steps must fit together without delays.
- + Summary of all documentation and approvals: The customer receives all documents, image documentation and approvals.



# A SYSTEMATIC APPROACH TO SERVICE & MAINTENANCE

## INTAKE REPORT

### TRACEABLE & DEPENDABLE FOR AUTHORITIES / INSPECTION BODIES.

Our intake reports use a system. They distinguish between a brick and a metal shaft. The specific usage requirements in each case generate different recommendations for action. In the intake report, we do not mince words. In line with the report, we give a recommendation for renovation.

Authorities, inspection bodies, but above all our customers trust this recommendation, because it is comprehensible and objective. The intake report compares the setpoints with the tangible actual values and derives a sustainable recommendation from the discrepancy. This distinguishes us from many other providers.

## MAINTENANCE AGREEMENT

### 5 INSTEAD OF 2 YEARS WARRANTY & ALWAYS UP TO DATE.

The standard warranty for dome shaft sealing for storage, filling and handling (LAU) systems of water-polluting substances is 2 years and begins with the completion of the renovation work. If you conclude a maintenance agreement with us, you will enjoy significantly more security: you will receive a 5-year warranty period. At least once a year, we inspect your dome shafts.

- Removing water from the dome shaft
- Removing coarse impurities
- Visual inspection of the liquid-tight coating
- Visual inspection of the corrosion protection coating (of pipelines, flanges, etc.)
- Final report on the services performed



**FAMILY BUSINESS  
SINCE 1995**



**MORE THAN  
40 QUALIFIED  
EMPLOYEES**



**SATISFIED  
CUSTOMERS**

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## CONTACT

If you would like to find out more about the collection service, please send us an e-mail [info@kh-tankschutz.de](mailto:info@kh-tankschutz.de) with the keyword "intake service".

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# Erfassungsprotokoll für Domschächte/Mauerwerk

Auftragsnummer:

Datum:

Kunde:

Adresse:



Tank & Korrosionsschutz e.K.

Angebotspartner:

Domschacht Nr.: von Tank Nr.:

B:

L:

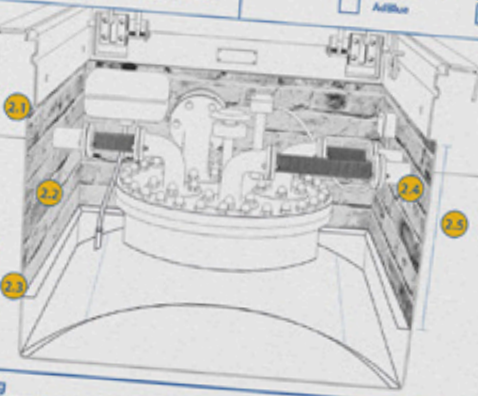
H:

Produktschild vorhanden  
wenn ja, lesbar  
Halterung

☐ ja ☐ nein  
☐ ja ☐ nein  
☐ i.O. ☐ defekt

Lagergut:

☐ Dieselloftstoff ☐ Heizöl  
☐ Ottokraftstoff ☐ Unbekannt  
☐ Adbluh ☐



Wasser im Schacht

☐ ja ☐ nein

Doppelschicht

☐ ja ☐ nein

## 1. Schachtabdeckung

1.1 Scharniere ☐ i.O. ☐ Beanstandung:

1.2 Gasdruckdämpfer ☐ i.O. ☐ Beanstandung:

1.3 Dichtungen vorhanden

wenn nein, notwendig

1.4 Korrosionsschutz vorhanden

wenn nein, notwendig

1.5 Sonstiges

☐ ja ☐ nein

☐ ja ☐ nein

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Erfassungsprotokoll für Domschächte/Mauerwerk - Stand 02/2021

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# Erfassungsprotokoll für Domschächte/Metall

Auftragsnummer:

Datum:

Kunde:

Adresse:

Domschacht Nr.: von Tank Nr.:

Produktschild vorhanden

wenn ja, lesbar

Halterung

☐ ja ☐ nein  
☐ ja ☐ nein  
☐ i.O. ☐ defekt

Wasser im Schacht

☐ ja ☐ nein

Doppelschicht

☐ ja ☐ nein

## 1. Schachtabdeckung

1.1 Scharniere ☐ i.O. ☐ Beanstandung:

1.2 Gasdruckdämpfer ☐ i.O. ☐ Beanstandung:

1.3 Dichtungen vorhanden

wenn nein, notwendig

1.4 Korrosionsschutz vorhanden

wenn nein, notwendig

1.5 Sonstiges

☐ ja ☐ nein

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Erfassungsprotokoll für Domschächte/Metall - Stand 02/2021

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Bemerkungen:

Bewertung durch KH Head Office:



Erfassungsprotokoll für Domschächte/Mauerwerk - Stand 02/2021

Name, Unterschrift:

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## A SYSTEMATIC APPROACH TO QUALITY & RESPONSIBILITY



Fachbetrieb  
WHG

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ID 0000056942



Management  
System  
ISO 9001:2015  
SCC\*\*

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des brevets



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