



Our Partner
WOLFTANK
DEUTSCHLAND

CORROSION AND LEAKS IN YOUR DOME SHAFT?

TANK PROTECTION 2.0: OUR HYBRID SOLUTION

● REVOLUTIONARY
TANK PROTECTION

● PATENTED
COLD CAST PROCEDURE

● INNOVATION THROUGHOUT
GERMANY



**TANK
PROTECTION
SHIELD**

Turtle shells offer natural protection unrivalled anywhere else in the animal kingdom. Made from connecting bone plates, they protect all of the turtle's vital organs. With this protection, turtles seem to have gained an extremely successful survival strategy. In a similar vein, however, a corroded dome shaft repaired with makeshift methods is only as durable as a turtle with a damaged shell.

**LIQUID
POWER PLATE**



TANK PROTECTION SHIELD TAKES DEVELOPMENT TO THE NEXT LEVEL

We are driven by innovative technology! As a forward-looking company specialising in tank protection systems, our work relies on trailblazing, sustainable technology.

Inspired by industry trends, we've partnered up with M2 Entwicklungs-, Produktions- & Vertriebs GmbH, part of the Heine Group, to develop the revolutionary 'Liquid Power Plate' (LPP). Together with our patented 'Tank Protection Shield' (TPS), this innovation marks the next generation of leak solutions for double-wall tanks.

Our hybrid LPP-TPS solution offers rigid sealing and simultaneous reliable protection against corrosion for tanks. How? The LPP compensates for strong material erosion due to corrosion, permanently sealing leaks in the process. Most importantly: There's no dangerous hot work involved!

**Taking tank protection
to the next level!**

LPP AND TPS – HYBRID SOLUTION FOR:

- Sealing leaks on dome covers
- Closing leaks on metal surfaces
- Repairing cracks in metal
- Correcting metal scarring

BENEFITS TO OUR SOLUTION:

- No high risk work required
- No welding required
- Quick and reliable results
- Significantly more cost effective than previous solutions
- Our service doesn't impact ongoing petrol station operations

WHAT SETS OUR SOLUTION APART:

- Powerful sealing and sustainable protection against corrosion
- Unrivalled properties of our products
- Quick-drying formula for rapid application
- Verified quality: DIBt approval for Tank Protection Shield®

Deutsches
Institut
für
Bautechnik

DIBt



Corroded dome shaft cover with pitting

Surface blasted with dry ice

Closure of pitting corrosion with Liquid Power Plate

**Epoxy vinyl ester-based sealing resin
for long-lasting results**



TPS
CARBON POWER

LIQUID
POWER PLATE

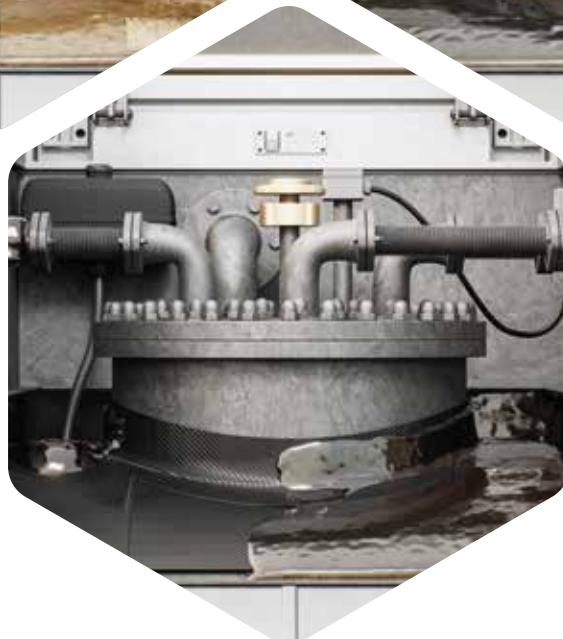
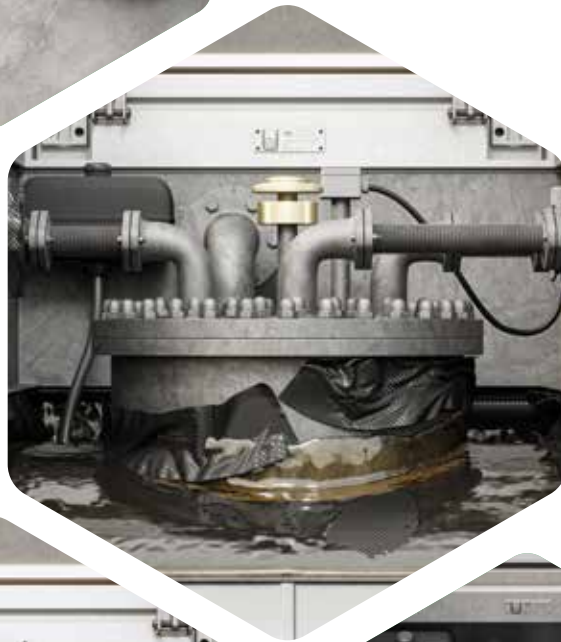
M2
NANOTEC

Circumferential 10 cm upstand

Liquid-tight coating, DIBt approved,
2,000 μm

Epoxy vinyl ester-based sealing resin for
long-lasting results

Carbon fibre-mesh



THE SAFE SEVEN

THE SAFE TPS PROCESS

Dome shafts on storage, filling and handling facilities (for liquids deemed hazardous for water) must be lined in a liquid-tight manner in accordance with the Water Management Act (WHG). This also makes them the Achilles heel of tank facilities! Intruding surface water, pressing water due to a high groundwater level for example, or residual drops from filling the tank can accumulate and be deposited in the dome shaft over a long period of time. Corrosion with strong material erosion is all but inevitable.

What can be done to avoid this? Hot work such as welding is highly dangerous. As a result, it's banned at most chemical and mineral oil companies. We developed our latest system, the Liquid Power Plate (LPP), to overcome precisely these issues. The 100% metal substitute offers high adhesion and joins directly to the metal following abrasive dry ice blasting. Afterwards, the dome cover is rigidly sealed against leaks.

Once LPP is applied to the leak, the proven TPS system is used again to complete the sealing process. LPP fully hardens within a matter of hours to form a pressure-tight surface on the tank cover once repairs are complete. The tank facility technician can perform the final pressure test for max. 4 bar (permanent pressure monitoring is 300 mbar) right after repair work is complete!

High calibre tank seals: LPP.

Unrivalled protection against corrosion: TPS.

Seven steps to safety:

Durable protection for dome shafts.

1. CLEANING

of the dome shaft and removal of water or Antifrogen; blasting the surface with dry ice after pre-treatment with an abrasive medium to remove any existing corrosion products from the metal surface

2. LEAK DETECTION

Uncovering damaged areas and preparing the tank walls for further treatment

3. LIQUID POWER PLATE

Force-locking in the cold process; the dome cover is force-sealed with a pressure-tight metal polymer to correct metal scarring due to corrosion or crack bridging in the metal

4. SEALING RESIN

Vinyl-ester sealing resin is applied to the prepared dome cover

5. CARBON FIBRE-MESH

The carbon fibre-mesh is inserted and reinforcing material is soaked to produce a homogeneous connection to the substrate, the laminate is vented

6. SEALING RESIN

The second layer of vinyl-ester sealing resin is applied to the pre-treated surface

7. COATING

Once the laminate has dried, the entire dome shaft is coated with a DIBt approved, liquid-tight, chemical-resistant, flexible coating from our partner Wolf tank Deutschland: EPOFLEX DOMR DIBT approval, AbZ-59.41-354



**IMPRESSIVELY
RELIABLE**



REPAIR WORK IN SEVERAL WORK STEPS

1.

UNCOVERING ALL VISIBLE DAMAGE:

Once the laminate has cured, the entire manhole is lined with a DIBt liquid-tight, chemical-resistant coating - in accordance with the requirements. This is the only way to reliably detect any damage to the outer shell of the tank (or pipes) after cleaning according to the above method.

3.

SEALING THE DOME COVER:

The first step is to clean the manhole and remove water or antifrogen. This is done by blasting the surfaces with dry ice (pellets, 3 mm diameter), to which an abrasive medium (garnet sand, 30/60 mesh) has previously been added in order to remove existing corrosion products, particularly from the metallic surfaces.

2.

SEALING AND CLOSING CORROSION DAMAGE, LAMINATING THE DOME COVER AND THE GAS PIPES:

- Seal corrosion damage or leaks > 2 mm with Liquid Power Plate
- Apply the vinyl-ester sealing resin with 0.5 to 0.6kg/m² on the pre-treated surfaces
- Insert the carbon fibre-mesh (200 g/m², 0.2 mm thick, filament diameter 7 µm, tensile strength 3,500 MPa) as a reinforcing material
- Cover the reinforcing material with a lamination roll to create a homogeneous bond to the surface
- Vent the finished laminate

The laminate covers the entire area of the visible dome shaft – not only damaged areas – and features a circumferential 10 cm upstand. This process results in a catchment basin protected against corrosion.





OPTIMUM TANK SEALING AND CORROSION PROTECTION **WITH LPP AND TPS**

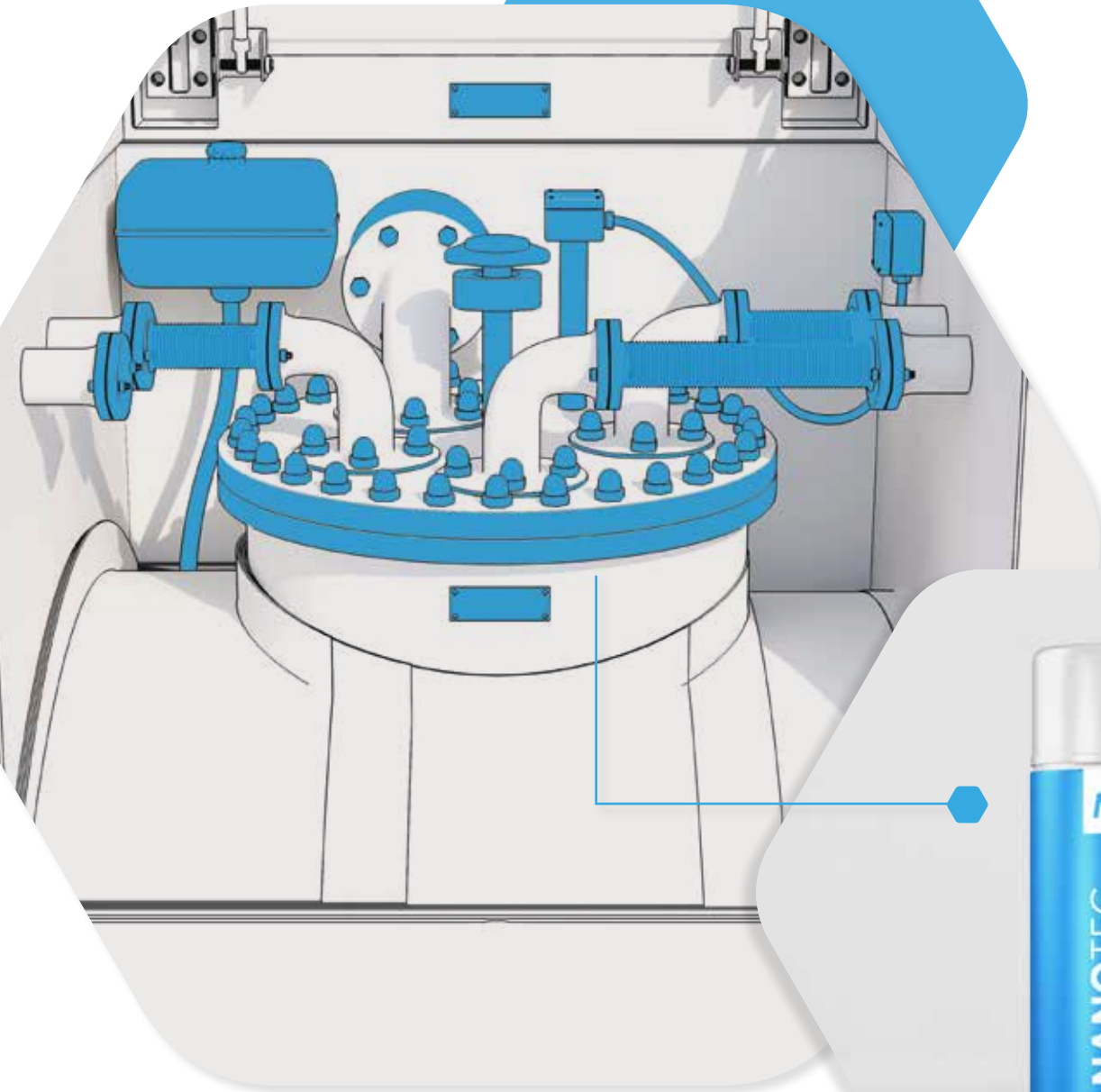
**BEFORE
RENOVATION**





AFTER
RENOVATION

NON-COATED
AREA



FOR SEPARABLE JOINTS AFTER DOME SHAFT RENOVATION

- ⊕ Microscopic zinc flakes
- ⊕ Minimal layer thickness
- ⊕ Conductive protection
- ⊕ Flexibility for future interventions

NEU: M2 NANOTEC

AVAILABLE AS OPTIONAL UPGRADE!

Revolutionary protection against corrosion:

Microscopic zinc flakes in action!

Innovation is at the heart of our solutions when it comes to protecting your dome shaft renovations in the long run. At KH Tank- und Korrosionsschutz, we understand that restoration isn't the only challenge posed by a renovation. One of the main issues lies in maintaining the integrity and functionality of your facilities in the long term.

The smallest components such as screws and washers play a particularly crucial role in the overall stability and safety of your facilities. To account for these factors, we have teamed up with M2 Entwicklungs-, Produktions- und Vertriebs-GmbH, a member of the Heine Corporate Group, to offer you a groundbreaking solution: M2 NANOTEC.

A new era in corrosion protection: M2 NANOTEC relies on pioneering nanotechnology and a thin zinc flake coating

At its core, the system consists of a unique zinc flake coating that offers impressive and conductive temporary protection against corrosion despite its thin 30 µm layer thickness. With this latest development, it's now possible to effectively protect joints while simultaneously ensuring they are separable – a key factor for maintenance work or future modifications.

Visionary protection: M2 NANOTEC optimizes dome shaft renovations and offers flexibility

Enjoy the following advantages when you use M2 NANOTEC, particularly after a dome shaft renovation. Thanks to the minimum layer thickness of the coating, we avoid the previously necessary application of thick coating materials, which would often compromise the separability of joints. Use M2 NANOTEC to not only secure your facilities against corrosion but to obtain flexibility for future interventions.

Our team of experts is happy to discuss the optimum application of M2 NANOTEC for your specific situation. We will work with you to provide lasting protection for your facilities using technologies that offer protection while also meeting the requirements of the future.





TAKING RESPONSIBILITY FOR PEOPLE AND THE ENVIRONMENT

Working on tank facilities, silos and in confined spaces requires a high level of safety. We prioritise not only the safety of our customers, but also the safety of our employees.

Our team receives extensive training and ongoing learning in line with the strict requirements of the German Social Accident Insurance (DGUV).

Training and passing the exam 'Expert for the clearance measurement of vessels and confined spaces' in accordance with DGUV rule 113-004 is mandatory for all employees.

We conduct regular training at our premises. During their sessions, employees learn how to safely work with the latest measuring devices to minimise the risk involved in working on dome shafts or silos. This helps avoid potentially dangerous situations. It also conveys key rescue methods to rescue injured or unconscious people from confined spaces.



PRECISE PLANNING, SEAMLESS COORDINATION

- +** Detailed discussion of the construction project by experts – we explain all details and eventualities to make sure our customers can follow every step of our work with full transparency.
- +** HSSE-oriented planning for comprehensive safety: Before work starts, we coordinate all measures to ensure health, occupational safety, safety and environmental protection with the petrol station operator in line with the pertinent regulations. We aim to provide a safe work environment and proactively avoid potential risks.
- +** Alignment and coordination with external companies and subcontractors: In order to ensure a seamless work process, scheduling and collaborations for the individual work steps are carefully planned and coordinated to avoid delays.
- +** Extensive documentation and complete approvals – the customer receives all documents and photographic records.

SERVICE & MAINTENANCE SETTING THE STANDARD

INSPECTION REPORT

TRANSPARENT AND RELIABLE FOR THE AUTHORITIES AND INSPECTION BODIES

Our inspection reports follow a logical system: They distinguish between a stone wall shaft and a metal shaft. The unique use requirements for each type result in different recommended actions. We cover all bases in detail in the inspection report, with nothing untouched. We also issue renovation recommendations based on the

report. The authorities, inspection bodies and, most importantly, our customers can trust this recommendation due to its transparent and objective nature. The inspection report compares the concrete current values to the set values to derive sustainable recommendations from any disparity. This sets us apart from many other providers.

MAINTENANCE AGREEMENT

5 YEARS WARRANTY INSTEAD OF 2 AND ALWAYS UP-TO-DATE

Standard warranties for dome shaft sealing systems for storage, filling and handling facilities designed to handle water-polluting substances typically only cover 2 years and start once renovation work is complete. Enjoy more peace of mind by concluding a maintenance agreement with us: Receive a 5 year warranty. We'll give your dome shaft a close inspection at least once a year.

- Removal of water from the dome shaft
- Removal of coarse contaminations
- Visual inspection of the liquid tight coating
- Visual inspection of the corrosion protection coating (pipes, flanges, etc.)
- Final report of the services performed



**FAMILY COMPANY
SINCE 1995**



**OVER 40 EXPERT
EMPLOYEES**



**SATISFIED
CUSTOMERS**

Interested in our inspection service?

Send us an e-mail at info@tps-service.de
with the subject „Inspection service“.

**SUSTAINABLE
SUCCESS FOR YOU
THE ENVIRONMENT**
– OUR VISION
UNITES

Erfassungsprotokoll für Domschächte/GFK

Leitungsnummer: _____ Datum: _____
 Name: _____ Adresse: _____
 Tank Protection Shield Service - GmbH
 Ansprechpartner: _____

Domschacht Nr.: ☐ V01 ☐ V02 Tank Nr.: ☐ B: ☐ L: ☐ R:

Produktschild vorhanden:
 wenn ja, lesbar ☐ ja ☐ nein
 Halterung ☐ ja ☐ nein

Lagepunkt: ☐ Handlöffel ☐ Handlöffel
☐ Druckluft ☐ Druckluft
☐ Abfall ☐ Abfall

Wasser im Schacht ☐ ja ☐ nein
 Doppelschicht ☐ ja ☐ nein

1. Schachtabdeckung

1.1 Schere ☐ ja ☐ nein
 1.2 Gasdruckprüfer ☐ ja ☐ nein
 1.3 Dichtungen vorhanden:
 wenn nein, notwendig ☐ ja ☐ nein
 1.4 Korrosionsschutz vorhanden:
 wenn nein, notwendig ☐ ja ☐ nein
 1.5 Sonstiges ☐ ja ☐ nein

2. Schachtwände

2.1 Abdichtung Abdichtung/Wand ☐ ja ☐ nein
 2.2 Zustand GFK Wand ☐ ja ☐ nein
 2.3 Anschlussfuge Kraken/Wand ☐ ja ☐ nein
 2.4 Abdichtung Rohrdurchführung ☐ ja ☐ nein
 2.5 Flüssigkeitsfuge Ausbuchtung vorhanden:
 wenn nein, notwendig ☐ ja ☐ nein
 2.6 Sonstiges ☐ ja ☐ nein

Erfassungsprotokoll für Domschächte/LPG

Leitungsnummer: _____ Datum: _____
 Name: _____ Adresse: _____
 Tank Protection Shield Service - GmbH
 Ansprechpartner: _____

Domschacht Nr.: ☐ V01 ☐ V02 Tank Nr.: ☐ B: ☐ L: ☐ R:

Material Bezeichnung: _____

1. Schachtabdeckung

1.1 Schere ☐ ja ☐ nein
 1.2 Gasdruckprüfer ☐ ja ☐ nein
 1.3 Dichtungen vorhanden:
 wenn nein, notwendig ☐ ja ☐ nein
 1.4 Korrosionsschutz vorhanden:
 wenn nein, notwendig ☐ ja ☐ nein
 1.5 Sonstiges ☐ ja ☐ nein

2. Schachtwände

2.1 Abdichtung Abdichtung/Wand ☐ ja ☐ nein
 2.2 Zustand Bezeichnung ☐ ja ☐ nein
 2.3 Anschlussfuge Kraken/Wand ☐ ja ☐ nein
 2.4 Abdichtung Rohrdurchführung ☐ ja ☐ nein
 2.5 Flüssigkeitsfuge Ausbuchtung vorhanden:
 wenn nein, notwendig ☐ ja ☐ nein
 2.6 Sonstiges ☐ ja ☐ nein

Bemerkungen:

Bewertung durch KSH Head Office:

☐ ☐ ☐

Erfassungsprotokoll für Domschächte/LPG - Stand 08/2021

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A FOCUS ON QUALITY RESPONSIBLE ACTIONS



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