



International

ExploZero®

Explosion Protecting System

The leading technology

www.explozero.com

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International

Agenda

ExploZero® - overview of the technology

- ExploZero® - scenarios of usage
- collateralization of petrol stations
- further civil scenarios of usage
- military scenarios of usage
- contact information

ExploZero® - what it is



ExploZero® is the most advanced explosion suppression system for protecting liquid and gaseous media. ExploZero® combines maximum safety with easiest handling.

The system of ExploZero® consists of nonflammable synthetic fibres, which were drilled into cylindrical brush elements. The single brushes were fixed together into system packs which do not even afterglow. The system packs guarantee most effective and rapid filling of large-volume spaces. According to the geometry of the exposed spaces, the system packs can be produced in various sizes. Besides synthetic fibres also high-temperature materials can be used if needed.

Through the flexibility of each brush element, the system packs fit in every imaginable environment. Individual elements reliably secure the tightest corners and sensitive fittings without additional packaging cost.

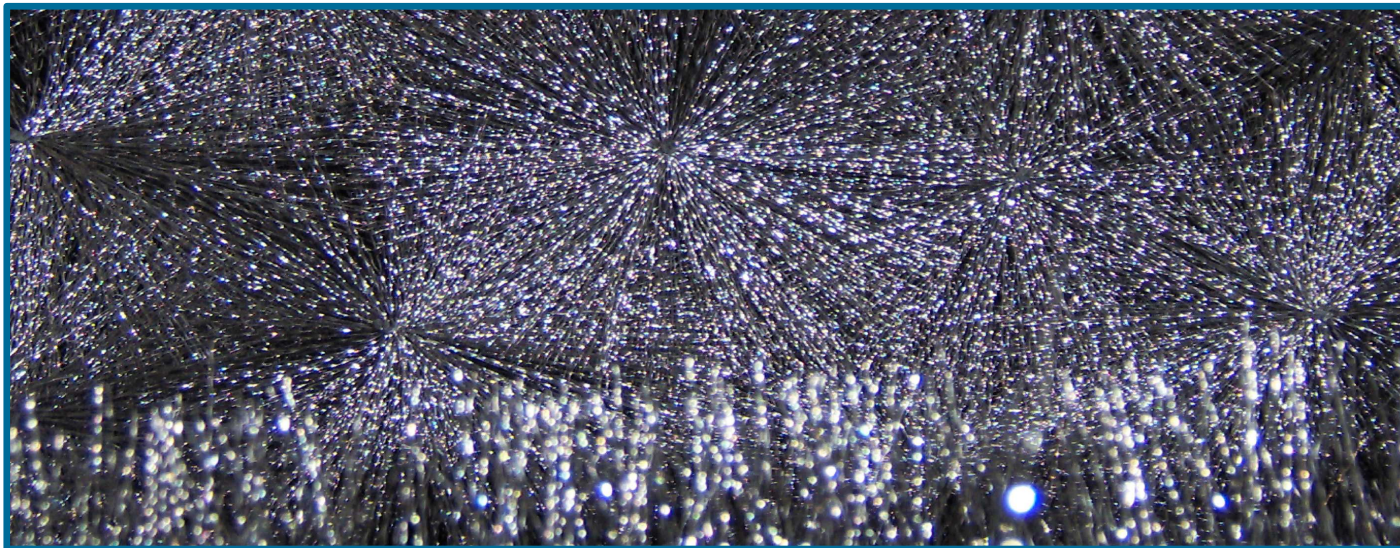


ExploZero® - how it works



ExploZero doesn't look like very impressive. But what's behind the black brushes is pure high-tech. The system is built up by thousands of superfine intertwining plastic threads of the single brush elements and splits the space which is to be protected into millions of single cells. Therefore a complete filling of the endangered space prohibits the unlimited diffusion of the explosion to unleash its devastating effect.

- **The ExploZero system stops explosion flashovers!**
- **Explosions cannot unfold their devastating effects!**



ExploZero® - the TSE advancement



ExploZero® is used in system packs and is the further development of the international well known TSE® Tank-Safety-Element system.

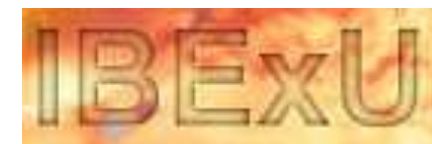
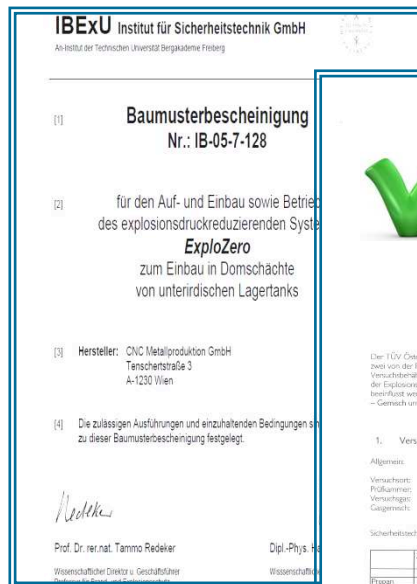


Official Certifications & Notified Bodies



Not less than three independent institutes were charged to determine the effects of ExploZero®. The concordant result speaks for itself ...

- ExploZero® passed all tests und was released for international sale.
- ExploZero® is the only certified system for shaft collateralisation on gas stations.
- ExploZero® is the only system with assigned design and type certification





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Anwendungsszenarien



Tank Collateralization within
the Chemical Industry

Collateralization
of barrels

Tank Collateralization
of civil crafts

Tank Collateralization
of tank trucks

Collateralization of
fuel tanks and all kinds of
shafts

Collateralization of
petrol stations



Tank Collateralization of
aircrafts and helicopters

Collateralization
of tank storages

Tank Collateralization
of military crafts

Tank Collateralization
Navy

Collateralization of
containers and tank
wagons



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THE (DOME) SHAFT and TANK-SPECIALISTS

Scenario of usage: petrol stations Hazard potential dome shafts



Dome shafts are under earth manholes at petrol stations, where fitting and dipping equipments and all relevant controls and instruments are located which are obligatory for the storage of fuels. Especially the controls for finding the correct amount of fuel hold high hazard potential.

Especially at gas stations with Superethanol E 85, maximum safety installations are required. Because of inappropriate dipping or leaky connectors petrol fumes or fuels can escape within the dome shaft. Petrol fumes that are heavier than air collect at the bottom of those manholes. At presence of an ignition source those petrol fumes will cause a devastating explosion.

Especially hazardous are fuels consisting of ethanol because of the high explosion readiness of 3,4 Vol% - 15 Vol% and non-conducting plastic pipes. Depending on the rate of flow, those pipes get charged with up to 90.000 volts and can cause explosions.

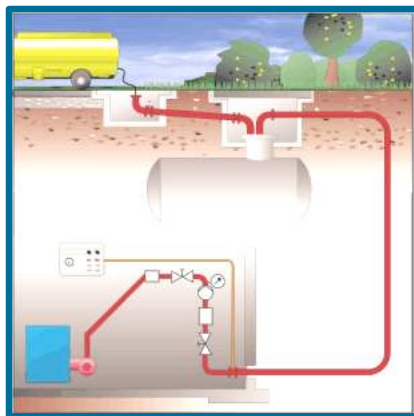
Because of the average size of a dome shaft (app. 1,5m³) explosions with extreme pressures and devastating effects take place. Dome shaft lids with an own weight of more than 120kg were catapulted dozens of meters through the air. The consequences of such „missiles“ lead to dramatic accidents again and again.

Using ExploZero such accidents are past.

With only a few hand grips shafts are secured – for lifetime!



Collateralization of dome shafts in detail



Picture 1



Picture 2

Pic. 1, Schematic illustration of a petrol station. A tank car provides the fuel for the via the dome shaft to the under earth tank storage.

Pic. 2, Schematic illustration of a fuel storage with the dome shaft mounted. Within the dome shaft you can see diverse controls and instruments especially for dipping and fitting.

Oic. 3, Top-view of an open dome shaft. Dome shaft collar with dipstick vent and diverse controls and instruments.

Dimensions app. 1m x 1m x 1,5m

Pic. 4, Gas station with drivable dome shaft lids. An average petrol station owns 5 dome shafts with a cubature of app. 1,5m³ per dome shaft.



Picture 3



Picture 4

ExploZero® used in a dome shaft



Legal situation industrial safety



Since 2006 there is a powerful obligation in matters of safety. The ATEX95-EU-directive regulates actions at workplaces with explosion hazard.

This EU-directive is valid for all European countries and is already harmonized and thus operative in most of the member countries.

Employers are committed to evaluate their working places regarding explosion hazard and to create documents for their employees how they are protected against explosions .

A non compliant implementation of the EU-directive can result in the closure of the complete facility!



Ordinance on flammable liquids National Right in Austria



The ordinance on flammable liquids (German: „Verordnung über brennbare Flüssigkeiten – VbF“ (BGBl. 1991/240)) parallel to the ordinance on explosive atmospheres (German: „Verordnung über explosionsfähige Atmosphären - VEXAT“ (BGBl. II Nr. 309/2004)) is especially focused on danger potentials of dome shafts. Find here the highlights of §51 VbF:

- The dome shaft has to be accessible in an unrestricted way so that service, maintenance and all affordable operations can be executed without unacceptable restraints.
- No strains may be passed on to the storage container from the dome shaft.
- Explosion protection has to be ensured by means of non flammable filling materials which can be easily removed.
- The dome shaft notch has to be capable of bearing the expected (traffic) weights, may not be disarranged and has to be secured against unauthorized opening.
- The materials used must not burn or afterglow
- No materials must be used that absorb gases
- Materials used must not degenerate, degrade and must be chemically stable against all different kinds of fuels and ethanol.

ExploZero® - The explosion protection revolution



ExploZero® was designed to fulfill the requirements at petrol stations, dome shafts, filling pump shafts, cable channels and tanks for liquid and gaseous explosive media. Current laws as well as economic aspects were carefully implemented within the technical realization.

By using ExploZero® the risk of explosions is minimized with regards to explosion expansion and increase of pressure.

ExploZero® protects life!



ExploZero® - advantages for the collateralization of petrol stations



Compared to the conventional shaft collateralizations with gravel fillings ExploZero® offers a multitude of advantages: **A complete shaft can be completely collateralized with only a few handgrips. The superlight packs can be installed in the shaft up to 4 times faster and can be removed for service or control access no less than 50 times faster. Especially at low temperatures ExploZero® brakes all rekords. Even in Winter it cannot freeze! In some countries water can be a massive problem in the dome shaft. Without removing ExploZero® from the dome shaft the water can be pumped out and the material takes no damage – it is completely wear and corrosion proof! And finally even cleaning is easy: simply use a steam jet and it is as good as new.**

ExploZero® does neither burn nor afterglow!



First VbF conform explosion protection

- ⇒ Fast and easy insertion and removal of the superlight Packages.
(Maintenance costs are reduced to a minimum!!!)
- ⇒ Inspections, repairs and maintenance can be executed within shortest time.
(This brings you a crucial time advantage in case of emergency!!!)
- ⇒ No risk of damage of fittings, measuring instruments or cables.
Fits all kind of shapes.
- ⇒ ExploZero® is resistant to chemicals and humidity
- ⇒ No corrosion caused through bounded humidity.
- ⇒ Compatible for liquid and gaseous media.
- ⇒ 100% abrasion proof
- ⇒ No disposal costs if fuel leaks out (Gravel).
- ⇒ Calculable amortization through longlife guarantee – stays in form, no decomposing, corrosion or degeneration
- ⇒ Environmentally friendly– cleaning can be done with a normal steam jet.





Thousands of petrol stations
will be newly built or modernized
in Europe in the next future.

THE MODERN, PROFITABLE INVESTMENT



The protection for petrol stations!

Potential and References



84.000 petrol stations in EU – Europe sum up to a theoretical need of **app. 700.000 m³ ExploZero**

⇒ Market entry through exclusive distribution especially for contractors!

References

Since the official release in the summer of the year 2009, a lot of petrol stations in Austria use ExploZero® as their explosion protection system. Among the customers you can find all global players within the petroleum industry.





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**THE MULTIFUNCTIONAL
EXPLOSION PROTECTION.
SAVES GOODS AND LIVES.**

Collateralation of all sorts of fuels

The little loss of volume and the little weight of ExploZero® make diverse scenarios of usage in INDUSTRIAL, CIVIL AND MILITARY sectors possible!



Security for
vehicles
and aircrafts



Storage of fuels and
chemicals



Aircraft Collateralization

Collateralization against
tank explosions

Reduction of the
mass inertia brings
stabilization advantages



Symbolic
pictures



Industrial usage

Protection projects for (dome) shafts and tanks for liquids and gaseous media in the petrol and chemical industry.





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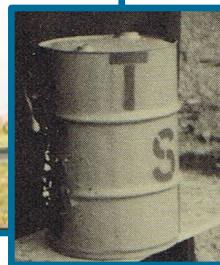
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Military Scenarios of usage

Primary tests with the Austrian and Swiss military department, the Italian Marine and NATO (tested in England) proof the efficiency of ExploZero®.





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KTT Tankstellentechnik



FAF Fürst & Fürst





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THE ULTIMATE EXPLOSION PROTECTING SYSTEM