

# Zentrifix F 92

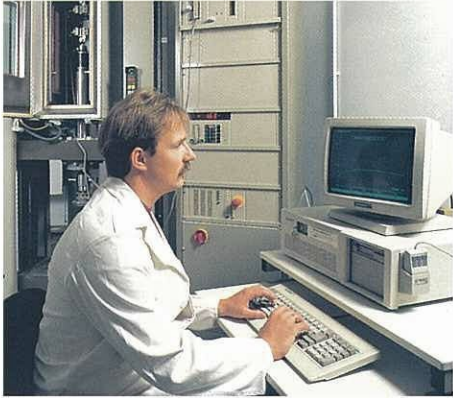
First class surface protection



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# From the idea to the breakthrough



## Do you plan or carry out concrete repair work?

**Yes?** Then take a moment to consider Zentrifix F 92. Zentrifix F 92 has been setting standards for surface protection operations for years.

- 1,000,000 square metres of reference areas
- 18 outstanding and guaranteed product properties
- 5-year report on practical use in building structures

Take advantage of this proved experience for your practical operations and your building.

Just one glance at the table of contents reveals the universal application possibilities of this surface-protection system.

## The idea

At the beginning of 1989, MC's research engineers started working on the following problem:

Concrete repair systems for the building construction sector needed to be made more economical, technically more reliable and appreciably easier to use for clients, planners and contractors.

The approach adopted was to reduce product and operation diversity to a minimum through the use of universal materials.

## The result

Just six months later, Zentrifix F 92 was created, a system combination that remains outstanding up to the present day.

The technical functionality of polymer-cement mixtures is combined with the aesthetic properties of fine-fillers.

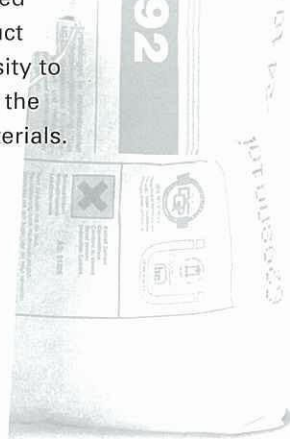
Zentrifix F 92 is:

- A surface protection system with fine-filler qualities
- Suitable for all civil engineering requirements
- and has superb crack-bridging properties without any need for curing



**MC**  
**Zentrifix F 92**

15 kg  
11 111 111 111  
11 111 111 111



## System properties ...



**18 outstanding product properties that provide long-lasting protection and security for the repair of your building structures.**

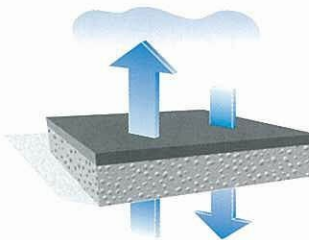


**1. No need for curing**  
Conventional fine fillers require curing. But not Zentrifix F 92 – a decisive, economical and user-friendly advantage.

**2. Can be smoothed**  
**3. Can be sponged down**  
Two properties that guarantee a closed, pore-free and even surface. A huge advantage for application.

**4. Sprayable**  
Besides manual application, Zentrifix F 92 can also be applied using the wet-spraying method. An advantage that saves time and money.

**5. Paintable**  
Because Zentrifix F 92 is paintable, building structures coated with Zentrifix F 92 can be designed in different colours without any problem.

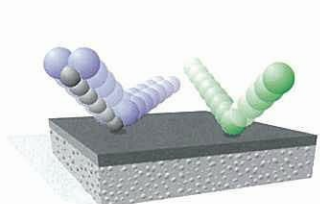


**6. Water-vapour permeable**  
Zentrifix F 92 behaves in an absolutely positive manner vis-à-vis water vapour. The diffusion-resistance value of 1.1 m is far below the requirement of 4 m.

**7. Hydrophobic**  
**8. Watertight**  
Being permeable to water vapour does not, however, mean being pervious to water. On the contrary, Zentrifix F 92 is hydrophobic and watertight.

**9. Impervious to water**  
With a pressure-water resistance of up to 9 bar, Zentrifix F 92 is completely impervious to water.

**10. Resistant to permanent water exposure**  
Zentrifix F 92 is also resistant to permanent water exposure. The only requirement for this is that, before being exposed to water loading, the coating must be at least 7 days old.



**11. Carbonation-inhibitor**  
**12. Carbonation-resistant**  
With a diffusion-resistance of 570 m against CO<sub>2</sub> – the requirement is 50 m –, Zentrifix F 92 inhibits carbonation of the structure. However, Zentrifix F 92 not only protects concrete against carbon dioxide, it is also carbonation-resistant itself.

**13. Chloride-proof**  
Numerous tests and research projects have confirmed impressively that Zentrifix F 92 is resistant to chlorides.

**14. Frost-resistant**  
**15. Resistant to de-icing salts**  
1000 frost-thaw cycle and 400 de-icing salt cycle tests, checked and confirmed by test certificates, prove that Zentrifix F 92 is resistant to such loadings.



## 16. Crack-bridging

Zentrifix F 92 remains flexible in its cured state even after many years and in cold conditions. This means that cracks are bridged permanently and reliably. Up to 1 mm in the static range and 0.3 mm in the dynamic range – values that put Zentrifix F 92 in a class of its own.

## 17. Oil-resistant

Zentrifix F 92 is an officially approved water-protection system.

## 18. Solvent-free

As Zentrifix F 92 is solvent-free it does not cause any harm during and after application and is environmentally friendly.



BUILDING DEPARTMENT OF THE CANTON OF AARGAU  
Civil Engineering/Bridge and Tunnel Construction Department

## Elastic concrete coatings with Zentrifix F 92 supplied by the company MC-Bauchemie – 5 years experience

### Background

The Bridge and Tunnel Construction sub-department made a decision in 1990 in favour of elastic surface systems. [...] A new product that could be described as „suitable for construction-site work“ was offered by the company, MC-Bauchemie GmbH (MC): Zentrifix F 92. This product contains cement and is polymer-modified.

[...]

A system was required for repair work which, besides material technology requirements, could also be applied in a matter suited to construction-site work, i.e.:

- Application on concrete with normal residual moisture (not wet, but > 3%)
- No climatic restrictions (application at normal relative humidity, as well as ambient and substrate temperatures)
- Easy application with few operations
- Short waiting-times between individual operations, resulting in short overall application time for the entire system
- Fewest possible and easy curing measures.

### Test application

It was decided to carry out a test application. The support heads of a bridge constructed in 1990 displayed excessively low concrete covering and cracks in the railing post recesses. The bridge chosen is part of the N3/07 „Bözberg Autobahn“, planned for opening in the autumn of 1996. This means there were a good five years in which to observe the behaviour of the coating.

[...]

### Values after application

[...]

### Values after 2 years

[...]

### Values after 5 years

The coating did not display any external defects, either in the form of cracks or blistering. Gradual soiling was established, particularly on the side with the protective coating. [...]

The climatic conditions for optimum application are easy to comply with. [...]

### Summary

1. The Zentrifix F 92 elastic coating supplied by MC-Bauchemie still complies with the UA BR material requirements after 5 years. No complete hardening to the extent of loss of elasticity has been detected. [...]

[...]

4. The requirements for application are entirely suited to construction-site conditions. Climatic restrictions concerning application are relatively minor.

[...]

7. The Canton of Aargau will continue to use this coating as a standard procedure for structures with crack-bridging requirements. A „life“ of approximately 16 years is expected in this regard. [...]

Aarau, 7 October 1996 BR-Wa

Extract of a report of the Building Department  
of Canton Aargau, Swiss



## Practical examples: Industrial structures

As different as the demands on concrete protection for industrial structures might be – Zentrifix F 92 can be used universally.

### References (samples):

- Rheinische Kalksteinwerke (limestone plant), Wülfrath, 1993
- Hoechst AG, Frankfurt, 1994
- Braunschweigische Kohlebergwerke (coal-mines), 1995
- GKN-Gelenkwellenwerk (drive shafts), Mosel, 1995
- Rohrbrücken Laubag (pipe-support bridges), Schwarze Pumpe, 1996
- Contidrom, Continental, Wieze, 1996
- Norddeutsche Affinerie (refinery), Hamburg, 1997
- Margarine-Fabrik, Kama, Brzeg, Poland 1996



### The special technical and economical advantages for you are:

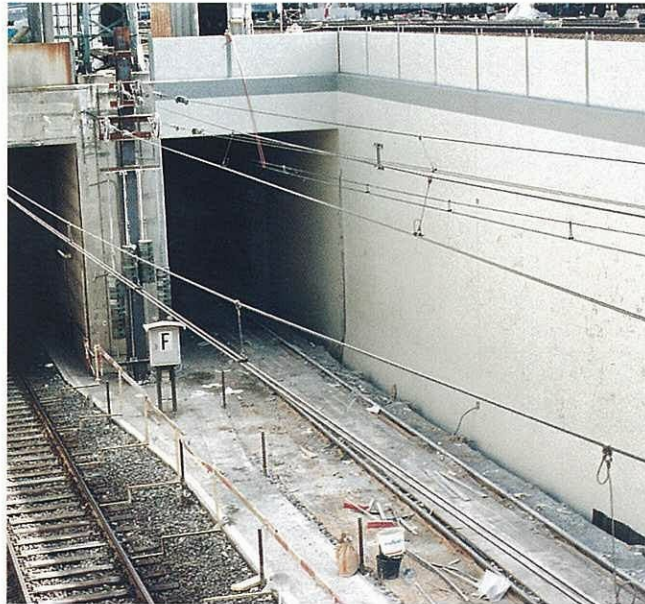
- Repair and concrete-protection work interferes with plant traffic, production and administration. One of the outstanding features of MC systems is their optimally short application times, thus minimizing shut-down and stoppage costs. Zentrifix F 92 combines fine filler and surface-protection functions in one single product, can be applied economically by spray method and does not require curing.
- In winter, roads and footpaths are kept free for internal logistics by using de-icing salts. Zentrifix F 92 protects adjacent structures against chlorides and is resistant to de-icing salts.
- Bund areas in tank, oil and lubricant stores require a protective coating. This also applies to transformer foundations. Zentrifix F 92 is an approved water-protection system. Because it is water-vapour permeable, it can also be used for damp substrates.
- Zentrifix F 92 protects concrete against harmful gases, such as CO<sub>2</sub> and SO<sub>2</sub>. The system not only inhibits carbonation, Zentrifix F 92 is itself resistant to carbonation.
- High reserve levels for static and dynamic crack-bridging provide security should the building be used for a different purpose in the future.

## Tunnel structures

Requirements for the permanent concrete protection of interior tunnel walls are extremely varied and differ from structure to structure. The unique range of properties displayed by Zentrifix F 92 provides a convincing solution to this problem.

### References (samples):

- Rendsburg Tunnel, Rendsburg, 1991
- Baregg tunnel, Baden (Switzerland), 1992
- Saukopf Tunnel, Weilheim, 1994
- Eich Tunnel (mountain tunnel), near Lucerne (Switzerland), 1995
- Elbe Tunnel, Hamburg, 1995 and 1997
- Eich Tunnel (underwater tunnel), near Lucerne (Switzerland), 1996
- Pécs Tunnel (Hungary), 1996.



### The special technical and economical advantages for you are:

- Damp interior walls can be coated directly. Where moisture penetration of the concrete occurs only from the surface, the coating initiates a drying process. Zentrifix F 92 is water-vapour permeable but watertight.
- Road tunnels are subjected to high de-icing salt loadings – chlorides cause aggressive chloride corrosion. Zentrifix F 92 is resistant to frost and de-icing salts and is also chloride-proof.

- Tunnel portals are subjected to high thermal stress. This is where the high crack-bridging capacity of Zentrifix F 92 really pays off.
- Road or rail tunnels – they are usually crucial transport links, which means that work frequently has to be carried out in the minimum amount of time. This normally leaves very little time for curing. Efficient spray application and the fact that it requires no curing make Zentrifix F 92 the economical solution.



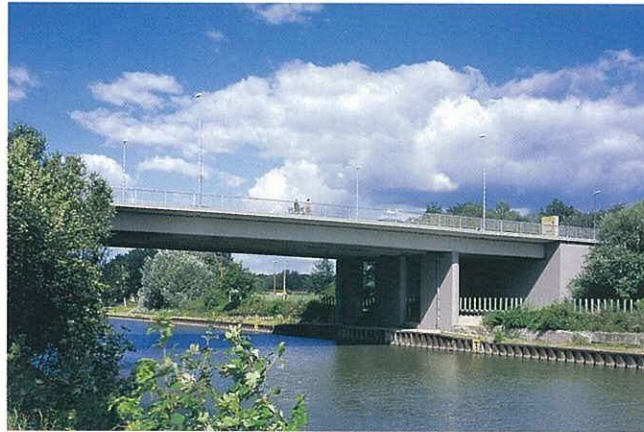
## Practical examples: bridge structures

Whether they are steel-reinforced or pre-stressed concrete, pedestrian, road or rail bridges, they are all exposed to extreme climatic influences. The constant rise in traffic volumes will increase loadings even more in the future.

Zentrifix F 92 provides you with the security reserves today that you will appreciate tomorrow.

### References (samples):

- Dense Bridge, Arnsberg, 1990
- Berlin Bridge, Wolfsburg, 1994/95
- August-Bebel Bridge, Elsterberg, 1995
- Limmat and Reuss Bridge, Aargau Canton (Switzerland), 1994 and 1996
- Bridges, M5 motorway (Hungary), 1996



■ Bridges, M3 motorway (Hungary), 1997

■ Estarkada Kwiatkowskiego, Gdynia, Poland, 1997

■ 4 bridges in Ireland (M1, M2/7, M2/5, A42/16 motorways), 1994, 1995, 1996

### The special technical and economical advantages for you are:

■ Zentrifix F 92 is water-vapour permeable and watertight, inhibits carbonation and is itself resistant to carbonation. Technical properties that guarantee the long-lasting protection of concrete and of the protective coating.

■ Road bridges are often strewn with de-icing salts to keep them safe for traffic. The structural sections in the spray and splash areas are normally subjected to the highest loadings in this regard. The frequent result of this is chloride corrosion of the reinforcing steel. Zentrifix F 92 protects the concrete and steel against chlorides and is resistant to both frost and de-icing salts.

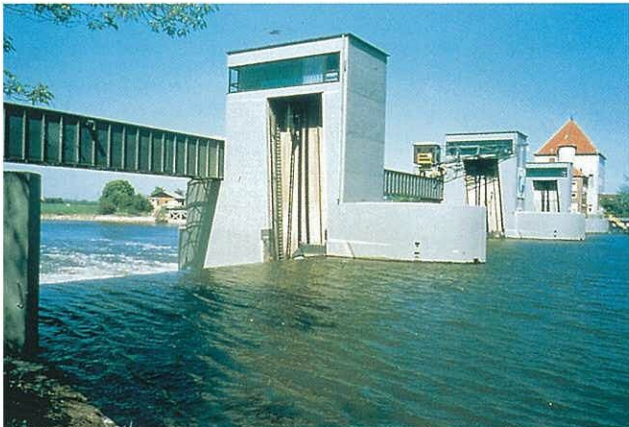
■ Cracked substrates encourage the penetration of harmful substances. This is where the coldness flexibility of Zentrifix F 92 comes into its own. Cracks are bridged permanently in

the static as well as the dynamic range. This effectively prevents the penetration of harmful substances.

■ Zentrifix F 92 guarantees high economic efficiency in application operations. Short waiting-times between the individual stages and the fact that Zentrifix F 92 does not require curing cut down repair times. Spray-application increases these advantages still further.



## Water structures



**Dams, weirs and rain-water-overflow basins in sewage-treatment plants are only a few examples of typical water structures.**

Zentrifix F 92 is not only a curing-free and crack-bridging surface-protection system, it is also highly resistant to water under pressure, it is watertight, and does not swell under water.

**The special technical and economical advantages for you are:**

- Water structures are subjected to differing – temporary, cyclic or permanent – water loadings.

The most severely affected area is the splash zone. The moisture-penetration and drying-out phases of the concrete alternate constantly. Depending on the degree of water saturation, these concrete surfaces are in considerable danger from frost. This is where Zentrifix F 92 shows its real strength. Its technical properties go far beyond standard stipulations. Zentrifix F 92 impressively

meets requirements concerning resistance to frost and de-icing salts.

- Zentrifix F 92 is outstanding under water through its high resistance to water under pressure and permanent water exposure.

- Damp substrates (in excess of residual moisture) are coated directly, thus doing away with uneconomical drying times and drying measures.

- Zentrifix F 92 can be applied by the wet spray method and does not require curing. This increases its long-term economic efficiency.

### References (samples):

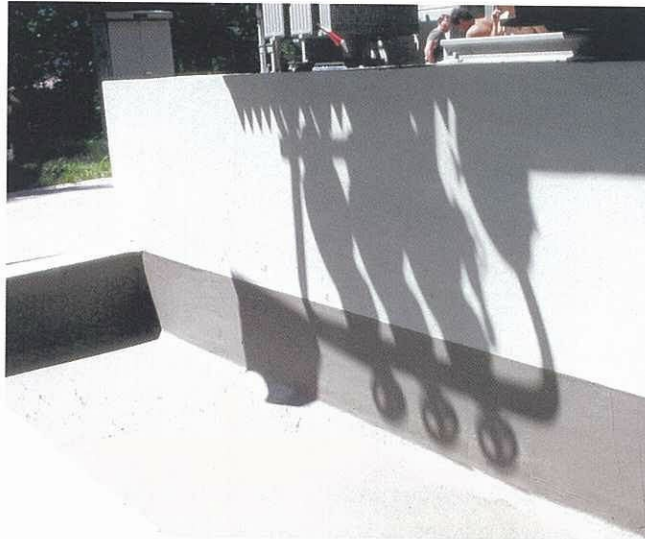
- Rainwater-overflow basin, Nettetal, 1990
- Eider barrage dam, Tönning, 1991/1992
- Rainwater-overflow basin, Trier, 1993
- Dam, barrage dam, Kelbra, 1994
- Rainwater retention basin, Salzgitter, 1995
- Weser Weir, Dörverden, 1995



## Practical examples: water protection

In locations where oils and other liquids harmful to water are stored, tanks and similar containers have to be placed in bund areas. Coating these bund areas ensures the required level of safety.

Zentrifix F 92 is an approved coating system that complies with the relevant German regulations and is resistant to oils as well as hydrocarbons.



### References (samples):

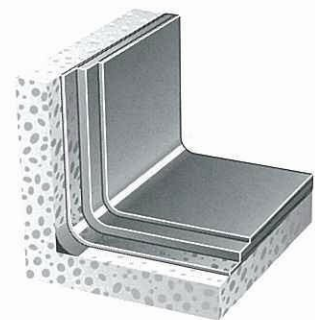
- VEW Dortmund, transformer spill basins, 1991
- Hüls AG, Nünchritz, transformer spill basins, 1992
- VEAG, Boxberg, transformer spill basins, 1993
- EVS, Stuttgart, transformer spill basins, 1993
- Neckarwerke, Altbach, transformer spill basins, 1993
- Vockerode, fuel store, 1995

### The special technical and economical advantages for you are:

- Zentrifix F 92 is water-vapour permeable and therefore insensitive to residual moisture in the substrate. Unproductive waiting-times before coating can be carried out are a thing of the past.
- In the case of cracked substrates, the high crack-bridging capacity of Zentrifix F 92 in both the static and dynamic range provides extra security.

- Application is simple and economical – only one product. The additional possibility of spray-application offers still further advantages.

**Coating structure (with coving) in accordance with the German Water Protection Law**



## Energy providers



**Mast foundations and district-heating ducts are two examples from the energy-supply sector. High demands are made with regard to their protection and repair. Added to this are the difficult working conditions. This is where MC repair systems show their true strength.**

**References (samples from the list of energy providers):** BEWAG, ESAG, HEVAG, MEAG, Preussag, RWE, Schleswig, Stadtwerke Lübeck, Steag, TEAG, VEAG, VEBA, VEW and WESAG.

**The special technical and economical advantages for you are:**

Repairing mast foundations means working on large numbers of small areas far apart, frequently on not very accessible terrain.

■ Thanks to brief re-coating intervals, the corrosion protection, bonding coat and coarse-repair operations are carried out on one and the same day with Zentrifix KMH and Zentrifix GM 2. Each mast location has to be visited only once.

■ Zentrifix F 92 is a technically high-quality surface-protection system with a high crack-bridging security reserve level. The same applies here, i.e. the system is applied completely within one day – even for damp concrete surfaces – and requires no curing. This saves time and money.

District heating is usually transported via saturated-steam pipes in underground lines. Despite good insulation, the servicing and control ducts are subjected to extremely high temperature conditions. Moisture and chloride loading caused by de-icing salts represent additional loadings.

■ The MC repair system meets all the special test requirements for heating-duct systems.

■ Only three materials are used for the entire repair work. Zentrifix KMH, Zentrifix GM 2 and Zentrifix F 92 are solvent-free, easy to apply, and cure excellently under high temperatures.

■ The following properties make the use of Zentrifix F 92 in district-heating ducts ideal: it is chloride-proof, water-vapour permeable, crack-bridging and does not require curing.



# Practical examples: Buildings



**Cracks or not: Normal or lightweight concrete: Zentrifix F 92 combines all surface-protection requirements in one single product, provides greater reliability than you need, and leaves you all the scope in the world for designing the appearance of your building.**

#### References (samples):

- Jenapharm, Jena, 1991
- School Complex, Neckargemünd, 1992
- University Clinic, Münster, 1993
- Alsfeld School, Oberhausen, 1993
- Bergerfeld Comprehensive School, Gelsenkirchen, 1995
- Schrotten School, Tuttlingen, 1996
- ESB Offices, Finglas Dublin, Ireland, 1997
- Plumber House, New Zealand, 1996

#### The special technical and economical advantages for you are:

- Having all the fine-filler and surface-protection functions together in one product ensures that the minimum number of work operations and waiting-times facilitate genuinely short repair times, quicker return to use of the building and savings on repair and scaffold costs.
- Greater technical security and future reserves. Zentrifix F 92 not only impedes carbonation, it is itself resistant to carbonation. Its crack-bridging capacity is far in excess of building construction requirements.
- No need to change systems for structural

areas subjected to heavy loadings. The base, foot-path and stairway areas of facades subjected to chloride and de-icing salt loadings are optimally protected.

■ Also no longer necessary: time-consuming and expensive curing. This makes quite a difference in the budget – especially for small partial areas, filigree structures, pillars, lesenes, parapet elements and balcony undersides, etc.

- Solvent-free
- Colour finish possible

# Application – as flexible as the product

## Manual application

**Application of Zentrifix F 92 is simple and economical.**

One product – two application operations – and the surface-protection system is complete.

**The two stages:**

### ■ Scratch coat

A scratch coat is first applied to the prepared, sound, dust-free, slightly moist substrate surface to seal any pores and voids.



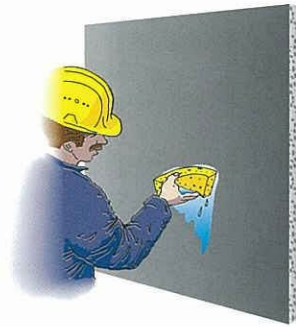
### ■ Coating

In the second stage of the operation, the coating is applied by trowel in a thickness of 2 mm onto the bearing scratch-coat layer and then smoothed.

You can now leave the surface of Zentrifix F 92 as it is. However, if you wish, you can make use of the technical advantage of smoothing the Zentrifix F 92.



This should be carried out using a hard rubber float in order to optimize the sealing of pores with the minimum amount of product.



It is also possible to apply further layers up to a total thickness of 4 mm.



# Application – as flexible as the product

## Spray application

Besides manual application, Zentrifix F 92 can also be applied using the wet-spraying method. Particularly suitable for this operation are worm pumps with variable delivery rates.

Your advantage:

- Faster application at lower costs.

**Practical application is carried out as follows:**

First, a thin layer is sprayed on and worked into the substrate using a hard rubber float.

As soon as this scratch-coat is of bearing strength, Zentrifix F 92 is sprayed on with a layer thickness of 2 mm.

The surface can then be left with the raw spray-finish or smoothed and sponged down as in the manual application process. Surfaces with a raw spray-finish display an orange-skin texture.

You can decide yourself what type of surface texture is the right one for your needs.



Working in Zentrifix F 92 with a hard rubber float.



Finished scratch-coat



Spraying on the coating



Zentrifix F 92 raw spray-finish

# MC everywhere near you

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