Facilitate

BELZONA'S FACILITIES MAINTENANCE NEWSLETTER

ISSUE 2 JULY 2011

INSIDE FACILITATE

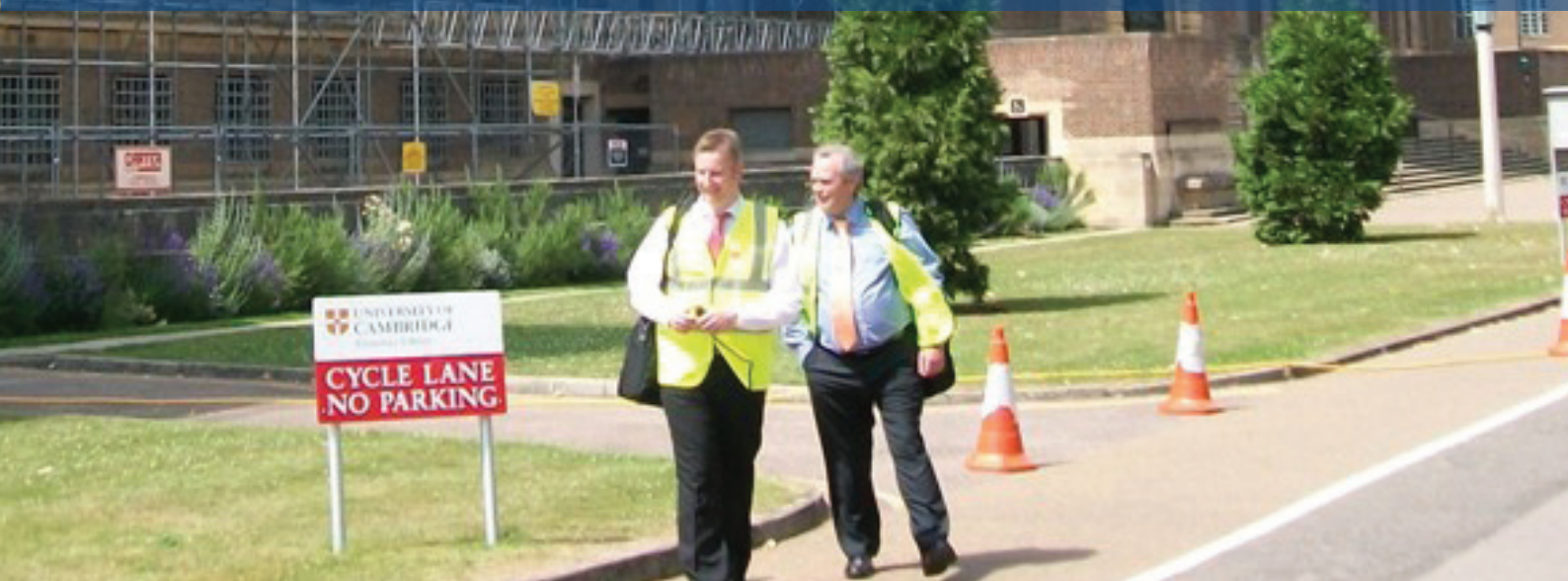
PRESTIGE UNIVERSITY

Roof repairs at one of the World's Oldest University Libraries

BELZONA®
Repair • Protect • Improve

Featuring Weathered but Waterproof for 20 years, Authorised Contractor Profile, Focus on…Food and Drink & much more...

Belzona Repairs Roof at one of the World's Oldest University Libraries



Belzona Polymerics Limited of Claro Road, Harrogate together with application services division Belzona Technosol Limited have recently completed a project by applying a Belzona high performance, liquid applied membrane system to repair a library roof at a well known University.

The poor condition of the roof and gutters meant various areas were leaking directly into the reading room below where many valuable books are stored and read daily by students.

Strict requirements needed to be adhered to when repairing the roof. Firstly the use of a solvent free, low smelling roof coating system was of high importance as the main reading room has many windows and vents opening onto the roof. Another requirement was that the repair must take place with minimum disruption as students would be studying directly underneath. The final requirement was that due to the many difficult & detailed roofing areas, only a liquid, seamless, cold applied system would be suitable.

Belzona rose to the challenge and specified the fully reinforced Belzona 3111 (Flexible Membrane) System which is a single component, solvent free, microporous coating for the long term repair and protection of all types of roofs. This versatile material provides outstanding weather proofing and waterproofing properties with excellent protection against infrared and ultra violet radiation and lends itself to application onto complex contours.

Belzona is not just a product manufacturer but can provide a complete supply and apply package through its contracting network specifically created to provide clients with direct access to Belzona's quality products, specialist application services, inspection services and supervision from a single source. It is Belzona's mission to meet specialist repair and maintenance needs in its target industries and markets worldwide.

"Strict requirements needed to be adhered to when repairing the roof. Firstly the use of a solvent free, low smelling roof coating system was of high importance as the main reading room has many windows and vents opening onto the roof."


After Application

FIGURE 1.2

TECHNICAL ARTICLE

CONCRETE REPAIR

Effective repair of concrete is an essential factor in achieving and extending the efficiency of any building or structure.

We generally think of concrete as a modern building material, yet it is one of the oldest and most durable building materials dating back as far as the Romans. Since then, the practice has developed to such an extent that reinforced concrete is now one of the major structural materials available to the construction industry and is proved successful in both performance and durability. Regardless of this success however, there are still many examples of failure of concrete units as a result of premature reinforcement corrosion.

Reinforced concrete is vulnerable to attack from a number of different elements such as abrasion, impact, vibration, chemicals and pollution. It is due to its porous nature and weak electronic forces which hold individual cement crystal together that it will deteriorate and corrode. The high Ph value of the concrete pore structure provides a protective coating of oxides and hydroxides on the surface of the steel reinforcement. Without this layer, which is known as a 'passive' film, the steel would be exposed to the air and moisture in the pores, leading to rapid corrosion. It is the main reason why reinforced concrete is a durable construction material. However, the passive layer itself can be attacked by chlorides in salt and the alkalinity of the concrete can be reduced by reaction with atmospheric carbon dioxide, a process which is known as carbonation.

Carbon Dioxide which is constantly present in the air dissolves in water to form a mildly acidic solution. Unlike other acids that may chemically attack and etch the surface of the concrete, this acid forms within the pores of the concrete where the carbon dioxide dissolves in any moisture present. As this reacts with the alkaline, the Ph value drops and moves as a front through the concrete. When it reaches the reinforcing steel, the passive layer decays exposing the steel to moisture and oxygen making it susceptible to corrosion.

For denser concrete, the rate of carbonation will be low and, given an initially appropriate depth of cover, steel will remain protected from corrosion throughout the life of the structure. However, if the concrete is permeable, or severely cracked, paths will be available for the access of atmospheric gasses, leading to increased depth of carbonation with consequent corrosion of the reinforcement. Corrosion of the reinforcing bars can ultimately cause spalling and eventually the breakdown of concrete.

Deterioration through carbonation of concrete has become an increasing problem in buildings and structures; however the extent of the damage can greatly vary depending on a number of different factors such as quality of the cement, the

grading and choice of aggregates, the amount of care that was taken during mixing and pouring and the depth of concrete over the reinforcement. In addition to this, over the years, there has also been an increase in atmospheric acidity and this, together with poor quality concrete, has lead to carbonation being a major problem in concrete structures today.

Belzona Polymerics Ltd, a design and manufacturer of industrial protective coatings and polymer repair composites provides a solution to the repair of damaged concrete. Belzona 4141 (Magma Build) is a two component lightweight, non porous concrete repair material specifically designed for rebuilding severely damaged or worn vertical/ overhead concrete surfaces. It is important that Belzona 4911 (Magma TX Conditioner) is used before application of Belzona 4141 as required for maximum adhesion.

This high build repair system has been found to be particularly effective not only in rebuilding spalled areas of concrete, but also as a corrosion preventative system on exposed reinforcing bars due to it's impermeability to water and chemicals. It requires no form work or supports and requires minimal access to equipment. Other added benefits of repairing concrete with Belzona 4141 (Magma-Build) are it's non-shrinking and impermeability leading to permanent repairs.

The fast cure and ease of application allows economical repairs to be carried out with the minimal amount of scaffolding.

By way of a case study, Figure 1.1 shows the concrete lintels of a Housing Authority that had spalled badly due to environmental damage, revealing the reinforcement bars underneath. The Housing Authority was fitting new windows and their requirement was that the repairs were carried out quickly and effectively as the appearance was becoming unacceptable.

Belzona 4141 (Magma-Build) was an ideal product for this application in particular due to the shape and size of the repair areas and colour matching as near as possible to the substrate. As the application would have to be carried out on a vertical level, Belzona 4141 (Magma-Build)'s lightweight properties are designed specifically for these types of applications requiring no support work.

Before beginning the application, the damaged area had to be cleaned and prepared. All loose material from the lintel was removed either by hand or using a wire brush. Belzona 4911 (Magma TX Conditioner) was then applied to all areas that could be repaired. The Belzona 4141 (Magma-Build) product requires no specialist tools so was hand applied and moulded to the shape required.

FIGURE 1.1

Figure 1.2 demonstrates the Belzona 4141 (Magma-Build) being applied.

The Belzona solution was chosen as the best way to affect a very quick and simple repair that could be done all at once without the need for formers to be left in place. The ability of Belzona to protect and resist further spalling was also a prime consideration of the client. Alternative was the use of traditional sand/ cement mortars that would have lacked future protective performance and would have required a much wider time frame to complete. This scheme saw 20 lintels of around 2 metres each complete in just less than three days. Figure 1.3 shows the end result.

This small case study shows just one of the many applications that Belzona 4141 can be used for. Other common application areas are stonework, roof ledges, bridges, canopies and pump pedestals. The Belzona product range is manufactured to stringent quality and environmental control guidelines complying with the internationally recognised requirements of ISO 9001:2008 and ISO 14001:2004.

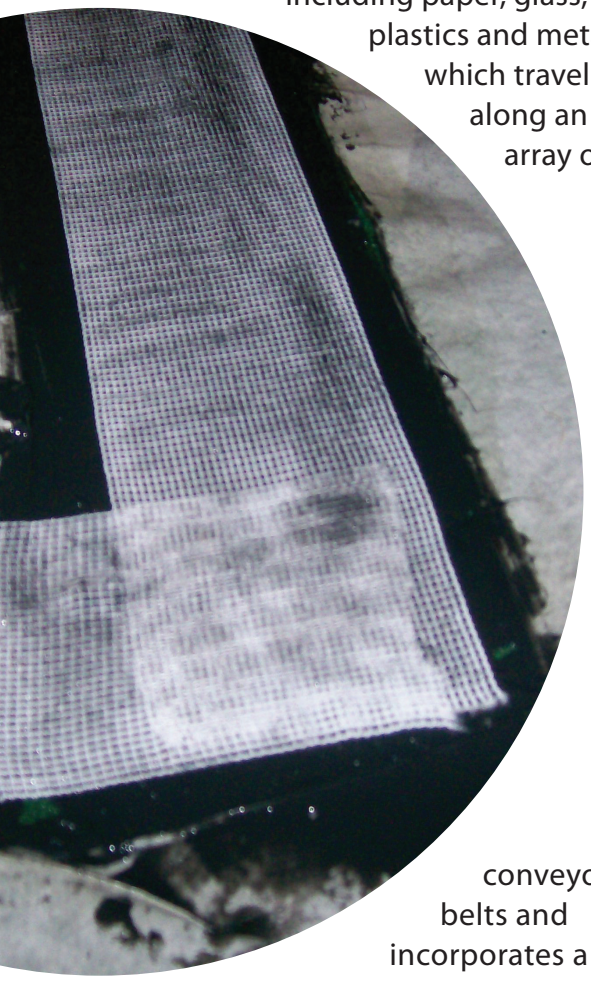
Completed Application

FIGURE 1.3

Belzona's Cost Effective Solution to Conveyor Belt Repairs

A leading nationwide integrated waste management company in Manchester have found great cost savings using Belzona's conveyor belt repair techniques opposed to replacement.

The new state of the art material recycling facility in Manchester handles a mix of dry waste materials including paper, glass, plastics and metal which travels along an array of conveyor belts and incorporates a range of separation techniques such as electro magnets, pressurised air jets and filter systems which are separated out into the different materials so they can be recycled.



Some of the conveyor belts are quite thin to enable the various separation techniques; unfortunately they can be damaged relatively easily and are costly and time consuming to replace.

In July 2010 Belzona's field sales engineer Jamie Robinson approached the site to discuss Belzona's polymeric solutions and took the opportunity to run through the various sites where Belzona may prove of assistance to them, one of them being conveyor repairs.

In August 2010 it was requested that Jamie attend site to carry out a repair on a new conveyor belt which had been in service just over a week and to deliver some onsite training. Jamie attended site one evening when the system had been scheduled for a shut down so as not to impact on production. On inspection of the belt an L shaped cut circa 300mm across the length of the belt was found. Jamie repaired the belt while the onsite maintenance team observed.

The procedure included removing the outer skin of the belt to expose the webbing and applying Belzona 2911 (Quick Drying Conditioner).When touch dry after 30 minutes the first coat of Belzona 2311 (SR Elastomer) was applied incorporating of Belzona 9341 (Reinforcing Tape). The process was completed by a further coat of Belzona 2311 (SR Elastomer) to fully encapsulate the Belzona 9341 (Reinforcing Sheet) and the complete repair area.

The whole process including preparation and repair took around 1 hour 15 minutes plus a further 1 hour at 20°c for the Belzona 2311 (SR Elastomer) to cure completely and cost

in materials £39.10. The cost of replacing with a new belt is estimated at £600.00 plus labour. The client has informed Belzona the repair has worked perfectly and they have since carried out a further two repairs - a saving of in the region of £1,400.00. The success of these repairs has generated interest from other sites, eager to learn more about the Belzona solution.

This application success story demonstrates not only the benefit of the Belzona materials to save time and reduce cost but also our commitment to customer service, being there to complete the repair and conduct training when the client needs it - even if that means doing so after hours.

AUTHORISED CONTRACTOR

Halls Applications

Specialist Belzona Contractors for almost 30 years.

Over the years Belzona Polymerics Limited has been working alongside a nationwide network of local contractors offering our clients quality assurance and ensuring the specialist application of our products.

In 1983 Belzona joined forces with one of their most trusted authorised contractors Halls Applications. Ever since they have provided expert services to the maintenance issues arising from equipment and structures in the North of England in a range of industries from education to the Ministry of Defence.

Ernest Hall and his two sons Graham and John started using Belzona products in 1983 and over the years the relationship between Halls and Belzona has grown very strong. Halls Applications are now considered one of Belzona's most reputable, long standing authorised contractors. The family business is currently run by Graham Hall and his two sons Ricky and James.

In recent years Halls Applications have gone from strength to strength and have successfully undertaken a vast and diverse range of Belzona applications all over the UK. In 2010 they completed repair and maintenance applications as far south as Llanelli, South Wales, as far east as Glusburn, North Yorkshire and as far north as Byker, Newcastle.

Halls Applications offer application solutions to problem areas such as water and weatherproofing, safety surfacing, concrete protection and an array of other situations. Their high working standards, reputation for quality workmanship and safe working practices make Halls Applications an ideal contractor for industrial sites, MoD sites, Councils and Schools.

Application Examples

1. Officers Mess Roof at an MoD site in North Yorkshire -

Problem – Several cracks and holes in the base of an asp
round ridge tiles running round the edge of the roof, res
officers' quarters. Belzona 3111 (Flexible Membrane) was
flexible and durable coating which could be applied with
resistant to varied and harsh weather conditions.

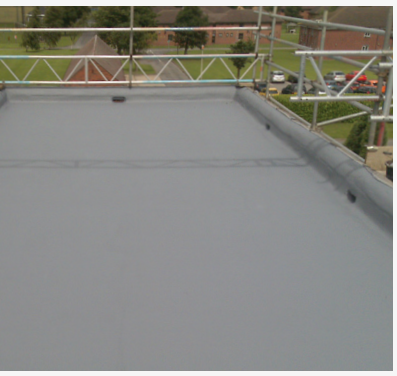
3. Primary School in North Yorkshire - Playground Steps

Problem – The large, tarmac playground slopes downwa
So during wet conditions a lot of water runs over them a
children. Belzona 4411 (Granogrip) provides a high frictio
in all weather conditions.

5. Library Roof in Colburn - 2010

Problem – Lead flashings were stolen leaving large areas
Belzona 3111 (Flexible Membrane) was selected to encap
stolen again which looks great and has no value for thiev

- 2008



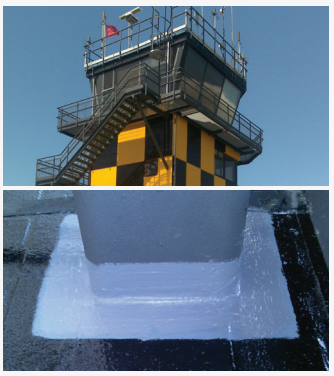
halt roof and poor detail on half-
ulting in severe water ingress into the
s used as it provides a long lasting,
h minimal preparation. It is also

s and Ramp - 2010

rds towards the steps and ramp.
nd makes them very slippy for the
on, high visibility, durable grip system

s of the roof exposed to water ingress.
psulate the lead so it could not be
ves to steal and sell.

2. Air Traffic Control Tower in North Wales - 2009

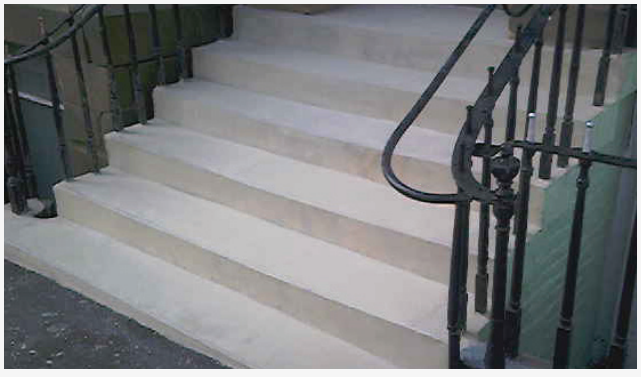


Problem – Old, flaking paint on Air Traffic Control Tower. Water ingress through hair line cracks in brick mortar joints Belzona 5111 (Ceramic Cladding) was used to provide a seamless and aesthetically pleasing finish while offering protection against erosion/corrosion.

4. Domestic Residence, Whitby - Sun terrace/balcony - 2010

Problem – New build terrace. Belzona 3131 (WG Membrane) provides an aesthetically pleasing, durable, waterproof and flexible coating for the terrace. It would easily be able to handle the foot traffic from the residents and harsh weather from the sea front Our reputation for quality workmanship and Belzona's quality products are well known in our local area and the building contractor in question decided to use our system on the newly built sun terrace/balcony.

6. Masonic Hall, Scarborough - Front steps - 2008



Problem – Old, worn, and cracked stone steps looked off putting and were becoming dangerous to walk on. A lightweight repair system which is stronger/harder to damage than stone was requested to complete this repair. Belzona 4141 (Magma Build) was selected as it can be quickly applied, distressed and worked to make the new repair system look old and in keeping with the original stonework on the building.

CONCRETE REPAIR

Within the Food and Drink Industry

Maintaining a hygienic working environment is one of the greatest challenges in the food and drink industry. Belzona Polymerics Ltd design and manufacture a range of products to meet the challenges of this industry by curing quickly with minimal odour, minimising downtime, labour and equipment replacement costs. Furthermore many of Belzona's products are solvent free and meet national and international standards for drinking water and food contact (NSF, WRAS, and USDA).

One common area of concern within the food and drink industry is the deterioration of concrete through carbonation. By way of example we have selected two different applications where Belzona's concrete repair solutions have been successfully used as a floor repair in supermarkets.

Example 1

A contractor for a large supermarket contacted Belzona to discuss concrete repairs at its chilled distribution centre. Due to the constant load of forklift trucks and metal wheeled trolleys bumping around 24 hours a day, holes and cracks had appeared in the concrete causing the floor to become a health and safety risk.

The contractor onsite had previously used Belzona 4231 (E-Magma Quartz) on similar applications, and stated it is the only product on the market he could use for these types of applications for the following reasons:

- It will cure down to 0°C, and the chilled distribution centre works at +2°C
- It cures very fast - great for a centre that works on a 'Just in Time' basis
- Its self-levelling properties are ideal for this type of application

The concrete repair was revisited and after 18 months of very heavy usage they are extremely delighted with the on-going results.

Example 2

Together with contracting division Belzona Technosol Limited, Belzona Polymerics Limited have completed some vital concrete floor repairs to a well-known high street supermarket in Irvine, Scotland. Following an inspection of the problem area, it was proposed that the defective concrete be removed and filled in with Belzona 4131 (Magma Screed) a high performance non-porous resurfacing material.

This Belzona solution was selrcted as it offers a safe, hygienic, seamless finish, providing excellent protection against impact, abrasion, vibration and chemical attack. Another key feature of this product is its quick curing, solvent free properties. This was of great benefit to the client as the location of the repair was in a busy area of the supermarket which could not be closed off during opening hours.

Belzona Technosol Limited completed the job in December 2010 and ensured the concrete floor would be safe for shoppers to walk on for many years to come.

Roof Repair 20 years on

Weathered but Watertight and Waterproof after 20 Years

In 1991 Belzona Polymerics Ltd along with a local contractor completed a large roofing application using a fully reinforced Belzona 3111 (Flexible Membrane) System at a major suture manufacturer in Taunton, Somerset. This is a single component solvent free microporous coating for the long term repair and protection of all types of roofs. This liquid applied material provides outstanding weather proofing and waterproofing properties with excellent protection against infrared and ultra violet radiation lending itself to application onto complex contours.

Following this original Belzona application, the roof was revisited earlier this year by one of our field sales engineers who surveyed the roof to find although it had weathered the roof was still in excellent condition providing a fully watertight and weather proof roof 20 years on.

Belzona Completes Full Refurbishment of a Chimney Stack

Belzona Polymerics limited along with local contractor have recently completed the refurbishment of a large chimney stack for a local council. Belzona has a proven track record working within the council resulting in them specifying the refurbishment was completed using Belzona products.

The 28 meters tall stack in North Wales had undergone remedial repair works in the past but due to its continued deterioration, a long term solution was required.

The works were carried out in 3 phases:

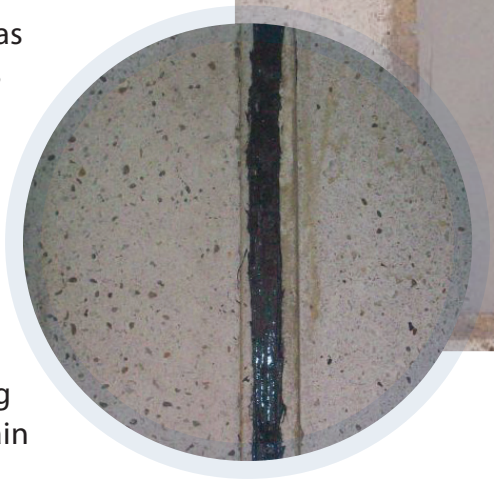
- The repair of damaged concrete
- The repair of expansion joints
- The application of protection and barrier coatings

The chimney stack had several areas of damaged and eroded concrete due to moisture seeping through and causing the cracking and flaking of the concrete.

The areas were cleaned down and all loose concrete was removed before Belzona 4911 (Magma TX Conditioner) was applied.

Belzona 4141 (Magma-Build), a lightweight concrete repair system was then applied. The product has been designed specifically to rebuild damaged vertical/overhead concrete surfaces and can be applied by hand requiring no specialist tools.

On inspection of the chimney stack it was discovered that several expansion joints also required repair. Belzona 2211 (MP Hi-Build Elastomer) a solvent free elastomeric polymer repair composite was the selected method of repair.



The chimney stack was then fully coated with Belzona 5151 (Hi-Build Cladding) a long term weather proofing coating for external structures. (See main pic on opposite page)

The final product used in this refurbishment was Belzona 5811 (Immersion Grade). The product was applied to the top of the chimney stack as it provides excellent chemical resistance and offers longevity to the repair.

CPD Presentations – A different way to reach our customers

Seminar Topics

Building and Structures

- Roof Repair and Protection
- Expansion Joints
- Floor Repair and Protection
- Internal and External Wall Protection
- Grip Systems
- Chemical Containment and Bund Linings

Machinery and Equipment

- Corrosion Under Insulation (CUI)
- Flange Face Reforming
- Keyway Repair
- Live Leak Sealing
- Rotating Equipment Performance
- High Performance Bonding
- ISO Compliant engineered Composite Pipe and Vessel Wraps
- Shaft Repair
- Other topics are available on request

In the UK there is an increasing expectation for the workforce to undertake CPD (Continued Professional Development) regardless of their roles or responsibilities. Several sectors require all employees to undertake a certain level continuing professional development programme per annum.

Belzona Polymerics Limited offer a range of current, relevant and educational CPD seminars designed to aid your personal career portfolio and give you a better understanding of the polymeric solutions Belzona can offer to repair, protect and improve your facilities.

CPD seminars are generally organised and presented by our national team of Field Sales Engineers. Our seminars will offer an insight into the latest developments in polymeric technology and can be tailored to your exact requirements ensuring the seminars are of optimum value to you and your organisation.

They will also give you the opportunity to engage in live demonstrations of our innovative products in action. The seminar is made up of a combination of short presentations and small practical demonstrations.

A specially tailored presentation will be created to ensure we effectively meet your needs by showcasing our most relevant product ranges and application examples. Often the sessions are completed with an open forum, allowing attendees the chance to use the Belzona products and discuss any requirements they may have.

We appreciate your time is precious and are happy to arrange seminars at your offices at convenient times, including lunchtimes. We also offer CPD seminars at our Head Office in Harrogate where you can see for yourself our ever growing facilities. Everyone who attends the seminar will receive a certificate of attendance on completion of the seminar and in addition, CPD points that will contribute towards your end of year target.

For more information or to organise a CPD (Continued Professional Development) Seminar please contact us on **01423 567641** or email us at **sales@belzona.co.uk**

Please complete the form below for your FREE Belzona survey

BELZONA
Repair • Protect • Improve

1. What is the problem area?

○ Roof ○ Wall ○ Floor ○ Structural Metal ○ Other

If Other Please State:

2. Is it inside or outside?

_____

3. What is the environment around the area?

○ Clean Air ○ Polluted Air ○ Splashed with Chemicals

○ Partly Immersed in Water or Chemicals ○ Totally Immersed in Water or Chemicals

○ Other

If Other Please State:

4. What is the total area to be treated?

_____

5. What is the substrate?

_____

6. What is the condition of the substrate?

○ Dirty ○ Rotting ○ Painted ○ Millscale ○ Porous ○ Greasy/ Oil

○ Cracked ○ Moss ○ Powdery ○ Blistered ○ Corroded ○ Leaking

7. Is the area subject to-

○ Stress ○ Impact ○ Abrasion ○ Point Loads ○ Pedestrian Traffic

○ Vehicular Traffic

8. What alternatives have been used previously?

_____

_____

9. What alternatives are being considered now?

_____

_____

10. Do you have contractual arrangements and contractor?

_____

_____

Please also complete the return address on the back of the survey, Thanks.

1ST CLASS MAIL
BUSINESS REPLY SERVICE
LICENCE NO HG 93

FREEPOST
HG93

BELZONA POLYMERICS LTD
CLARO ROAD
HARROGATE
NORTH YORKSHIRE
HG1 5BR

BELZONA®
Repair • Protect • Improve

Return Address
Name:
Address:

Post Code: