

# General preparation and application instructions

## Surface preparation

### Concrete, cement screed and cementitious

The surface must be sound, open textured and free of cement laitance, dust, oil, grease and other contaminants. Old and used surfaces should be checked for any chloride or oil contamination. Maximum chloride content < 0.25 % by weight. The prepared surface should have an average pull off strength of  $\geq 1.5 \text{ N/mm}^2$ . Lowest single value  $1.0 \text{ N/mm}^2$ . The concrete must be dry with a maximum moisture content of 4 % by weight (measured with a CM-moisture meter). There are several different methods of surface preparation, i. e. vacuum shot blasting, high pressure water jetting (> 800 bar) or grit blasting. Milled, diamond ground or polished surfaces should be treated by shot blasting and vacuum cleaning. In case of using high pressure water jetting, you must ensure that all fine concrete particles on the surface are removed. The working surface should have a rough preparation depth of 0.5 mm. Beware of alkali aggregate reaction. The manufacturer of the concrete or cement screed should confirm that the concrete resp. cement screed contains no alkali sensitive materials in accordance with the German DAfStb guidelines. Please contact us for further information.

### Vacuum concrete and hard-aggregate floor screed

These surfaces must be inspected carefully and treated in a special manner. Prior to the application, it is important to record the conditions and characteristics of the surface. All defects must be documented and kept as a record for the customer. As pore sealing primer use AB-POX 010 diluted with a suitable solvent.

### Wet concrete and green concrete

In case of present moisture, prior to any application, the undoubted cause and source of it has to be clearly identified. In the instance of rising damp / moisture we recommend the use of injection techniques to create a damp proof barrier. Once an effective barrier to the water ingress is established, we can recommend a system. Please contact us for specific support. As primer AB-ZEROPOX 810 or AB-POX 810 can be used. New concrete should have a mix design with a water-cement ratio of  $\leq 0.5$ . After approx. 5 days the surface can be prepared by shot blasting. We recommend to apply the primer AB-ZEROPOX 810 twice (see Technical Data Sheet for details).

### Old, oil-contaminated concrete and cement screed

Oil-contaminated surfaces must be repeatedly prepared with an emulsifying detergent (oil removing system) and cleaned by high pressure water jetting. Prime the cleaned and prepared substrate with AB-POX 004 (contact us for further information). We recommend to consult a specialised applicator / contractor for such projects.

### Bituminous industrial flooring (indoor)

Prior to application onto industrial mastic asphalt or latex, an evaluation of the surface has to be performed. The strength / plasticity has to meet the demanded stress level. For example: a 2 mm coating can't harden a soft surface. The surface must be prepared by shot blasting, grinding and / or milling; minimum 50 % of the filler aggregates have to be exposed. Voids, blow holes, soft areas and deformations must be removed and prepared with appropriate repair fillers. We also recommend to apply a test area first and examine the result after curing. AB-ZEROPUR 837 can be used as primer and self-levelling coat.

### Magnesia- and anhydrite / gypsum (plaster) flooring

Generally these surfaces are regarded as difficult or problematic; therefore prior to any coating application they must be carefully inspected and treated / prepared in an appropriate manner. It is usually possible to coat them if they have no soil contact (intermediate floor). Any surfaces that do not meet these criteria may only be coated with a sealer. All surfaces should be sound, firm, clean and free of dust, oil or grease. Prepare the surface by shot blasting or abrade using a proprietary grinder. Prior to and during construction, the floor should always be protected against potential rising damp. This must be a certificated task or assignment. The residual moisture should be 6 - 7 % for mineral, and 8 - 12 % for wooden magnesia surfaces (seal only!). The residual moisture for anhydrite / gypsum must be < 0.5 %. The pull off strength of the magnesia surface has to be >  $1.5 \text{ N/mm}^2$ , and >  $2 \text{ N/mm}^2$  for anhydrite / gypsum. We recommend first applying a test area. Please ask for our advice.

### Wood

Wooden surfaces must be clean, dry, and free of dust, oil grease and other contaminants. If necessary, prepare the substrate by abrading or shot blasting. AB-ZEROPOX 801 or AB-ZEROPOX 805 can be used as adhesive primers. We recommend to apply a test area and to examine the result after curing.

### Metal (in general)

If necessary, the whole surface can be cleaned by high-pressure washing using fresh water with at least 350 bar to remove salts and other contaminants (according to NORSOK M-501). Afterwards leave it to dry well. All contaminants like rust, mill scale, debris, grease, oil, dust, salt, etc. must be removed by using qualified equipment, e. g. high pressure water jetting, grinding or blast cleaning. The surface preparation depends on substrate and object conditions, the specified coating system and the expected strain. The surface must be free of all visible and invisible contaminants to ensure a proper adhesion. See DIN report 28 „corrosion protection for steel constructions by using coating systems – testing the surface regarding to invisible contaminants before application“. Preparation by blast cleaning according to DIN EN ISO 12944-4 (ISO 8501-1/-2) preparation level Sa 2½ with an average roughness of  $R_{Vs}$  ( $R_z$ ) 50 - 85  $\mu\text{m}$  resp. „middle (G)“ in accordance with DIN EN ISO 8503-2 (ISO 8503-2). Dust quantity value “1” for dust size class “3”, “4” or “5” according to ISO 8502-3. Lower dust size levels must be removed if they are visible without a magnifying glass. Depending on the requirements special primers or adhesion primers can be used. Please ask for our advice.

### Iron, steel (ferrous metals)

Constructions which are exposed to extreme mechanical, chemical and thermal strain, e. g. hydraulic engineering, offshore constructions or tanks (internal), require a very thorough surface preparation. Equally important is a suitable design for which you can find examples in DIN EN ISO 12944-2 /-3 and DIN EN 14879-1. Best results are achieved by blast cleaning (with tough grit) in accordance with DIN EN ISO 12944-4 resp. DIN EN ISO 8501-1; preparation grade Sa 2½. Use only approved blasting abrasives with angular grain. Average roughness  $R_{Vs}$  ( $R_z$ )  $\geq$  50  $\mu\text{m}$  (DIN EN ISO 12944-4, DIN EN ISO 8503-2) must be guaranteed. In case of doubt (e. g. saline air or used tanks which have been contaminated / polluted) the surface cleanliness must be measured regarding soluble contaminants in accordance with EN ISO 8502-6 (Bresle method) and EN ISO 8502-9 prior to coating. The maximum allowable concentration of soluble salts on a surface to be coated, measured as sodium chloride, is  $< 20 \text{ mg/m}^2$  (EN ISO 8502-9).

### High-grade steel („V2A“, „V4A“)

High-grade steel is regarded as problematic surface, because this substrate requires a thorough preparation to achieve a proper adhesion. In case of high chemical stress a surface preparation by grinding or sweep blast cleaning (with non-ferrous abrasive) may cause blistering. Basically blast cleaning with non-ferrous abrasives of angular grain has to be performed like it is described in the section iron and steel above: Roughness of  $R_{Vs}$  ( $R_z$ )  $\geq$  50  $\mu\text{m}$  (more if necessary) should be achieved (DIN EN ISO 12944-4, DIN EN ISO 8503-2). Grinding can be sufficient under certain conditions, but not equivalent to blast cleaning. Depending on the requirements special adhesion primers can be used. NOTE - see also metal (in general). Please ask for our advice.

### Zinc (non-ferrous metal)

Zinc is generally regarded as a very critical surface, because it forms oxidation products such as white rust, zinc sulphate, zinc chloride, which does not have appropriate bond strength and may impair the adhesion. These may be removed by an ammoniacal wetting agent washing or by steam cleaning (approx. 5 bar at 80°C) with a neutral or phosphorous acidic cleaning agent. Basically sweep blast cleaning is recommended but grinding with e. g. “Scotch-Brite” is also possible. For special ranges of application such as offshore structures sweep blast cleaning is always necessary to create an appropriate roughness without destroying the zinc layer. Sweep blast cleaning should be performed by using non-ferrous (mineral if possible), angular grit with a density of  $< 3.5 \text{ g/m}^3$  and a grain size of 0.2 - 0.5 mm. The angle of impact should be between 30° and 40° and the pressure between 2 and 3 bar. The swept surface should be of a lightly refracted, metallic gloss. Coating should be performed immediately after surface preparation to avoid the formation of corrosion products (for more details also see the German “BFS - sheet” No. 5 “Coatings on zinc and galvanised steel”, only available in German language). Depending on use, special adhesive primers are used. Please ask for our advice.

### Aluminium (non-ferrous metal)

Aluminium is a very critical surface, but it forms contrary to zinc, a fully closed, stable oxide layer which is firmly connected to the surface. Grinding or „sweep blasting“ (with non-ferrous grit / glass beads) is recommended. Please ask for our advice.

**N/B:** Grinding aluminium causes hazard of dust explosion or fire!



### Climate and surface conditions

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**Coatings should only be applied at decreasing or constant temperatures.** Otherwise, blistering occurs and is very difficult to remedy. Be aware of and consider windows, open doors, sun movement, heating installations including radiators, hot water pipes, infra-red heaters, etc. Observation of surface and ambient temperature is very important because changing temperatures are affecting the performance characteristics such as viscosity and curing time of resinous materials and may diminish the quality of the product. Low temperatures cause slower curing times which impair the surface negatively and increase material consumption. High temperatures cause faster curing times which can also influence the finish in the same, negative way. Optimum operating temperatures are between 15 - 25°C. Prior to, during and after the application process the substrate temperature must be at least +3°C above the current dew point (condensation) temperature. Forced and inadequate ventilation affects especially water-based systems and causes condensation which results in visible surface imperfections. Freshly applied coatings must be protected against moisture such as condensation, rain, water, etc. until the product is cured and has reached the chemical resistance properties. Otherwise the surface may change colour, form bubbles or become tacky. These problems can only be remedied by shot blasting and applying a new coating.

### Working and safety instructions

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#### Mixing

ABP - products are delivered as a combined set which corresponds to the mixing ratio. Bulk deliveries have to be weight on a scale. **Stir up the main component thoroughly before adding the hardener component.** Use a suitable low speed electric mixer. To avoid mixing errors, repot the homogeneously mixed product always into a clean container and mix again. The speed of the mixer should be approx. 300 - 400 rpm. Higher speed adds too much air into the product and lower speed does not ensure a homogenous mixture resp. mixing time is increased (potlife). The temperature of all components should be between 15°C and 20°C (depending on the product). This also applies for possibly added fillers such as quartz sand, etc. Fillers should be added after both components were adequately mixed. Single component products also have to be stirred thoroughly before use.

#### Processing and application (industrial floors)

**Mixed material must be poured immediately onto the surface to avoid exothermic heat reaction in the drum, which reduces the processing time considerably.** Depending on the system, the products can be applied by roller, trowel, poured or sprayed. Primers should be spread with a rubber squeegee and rolled crosswise with a short-haired paint roller (avoid ponding!). The freshly applied primer should always be lightly sprinkled with clean, dry quartz sand Ø 0.4 - 0.8 mm. This destroys the bubbles and improves the adhesion of the following coat. A scratch coat can be made of e. g. AB-ZEROPOX 803 filled 1 : 0.8 with clean, dry quartz sand Ø 0.1 - 0.3 mm and is usually applied by trowel or notched rake and should also be lightly sprinkled with clean, dry quartz sand Ø 0.4 - 0.8 mm. Topcoats / sealers are usually applied with a short-haired paint roller, but we recommend to spread them evenly with a rubber squeegee before rolling. The same applies to roll-on coatings. Self-levelling coatings have to be applied with a trowel or notched rake. Trowel applications should only be processed by suitably experienced personnel as any variation in trowel pressure will vary the appearance and the thickness of the surface. Application with a notched rake (rubber or metal) is much easier and leads to a constant coat thickness. Beware of wear of the rake during the application process. Usually the notched strip should be replaced after approx. 200 - 300 m<sup>2</sup>. Approximately 5 to 10 minutes after application the coating should be treated with a spiked roller. This helps ventilating the coating and achieves a better surface finish. For non-slip flooring systems, a filled self-levelling product is used as binding layer which needs to be scattered uniformly with aggregates or quartz sand. After curing, remove the excess sand and abrade carefully using a grinder that is equipped with a carborundum disc. Afterwards clean the surface with an industrial vacuum cleaner. Screeds should only be applied by experienced applicators. The different methods of application will be adjusted to suit the work process / logistics, and the specific characteristics of the product. Depending on the product, the tools (roller, rake, trowel, etc.) should be replaced and cleaned regularly. Please ask us for detailed information.

## Technical Information



### Processing and application (corrosion protection)

Prior to priming layer, all corners, edges, weld seams and other difficult reachable areas have to be manually coated by brush to ensure an adequate layer thickness. If needed, this procedure has to be processed prior to every following application. Airless application is necessary to reach the specified layer thickness. Application by brush or roller does not reach the specified layer thickness and is not reasonable for large areas. Unless no contractual specifications were made, 90 % of the measured dry film thickness (DFT) must be above or equal to the specified film thickness and none of the remaining 10 % should not be less than 90 % of the specified layer thickness. Depending on product, the materials are usually applied by using high-performance 1-component airless spraying equipment (e. g. Graco King Xtreme / on demand use a flow heater) or brushed / rolled on small areas with suitable tools. All tools / equipment used for application such as spraying machine, roller or bush have to be cleaned / replaced regularly (depends on usage / product). To clean and flush the spraying equipment / machine we recommend to circulate AB-COR 999 with a temperature of approx. 30 - 40°C.

### Maintenance and service for industrial floors

We recommend to protect the flooring system by using an acrylic or wax polish before use. The surfaces will be easier to clean, be more durable and look better. This is necessary for floor systems that receive high volume pedestrian traffic or other forms of mechanical impact. See also the cleaning and maintenance instructions.

### Storage

Shelf life and material temperatures are affected by storage conditions and are also valid for storage at construction site. Follow specific instructions and guidelines from Safety Data Sheets and other technical information.

### Safety

Liquid synthetic products are dangerous in liquid form and can contaminate earth / soil, sewage and drainage systems, and also rivers, lakes / dams and streams, etc. Separate, marked components are partially harmful and / or corrosive and / or irritating. Once correctly mixed, most risks are reduced. Once cured, most of our products are inert and harmless and do not pose threat to the environment. Always wear suitable protective clothing, gloves and eye / face protection when handling or applying the materials. A first aid bag, eye-wash fountains and the address of the nearest doctor / medical service should always be on hand. **Ensure adequate ventilation during the application of any product. Should there be any doubt or insufficient ventilation, wear suitable respiratory equipment.** For additional references to safety-hazard warnings, regulations regarding the transport and waste management please refer to the relevant Safety Data Sheets.

### Precautions and code of behaviour

The precautions and the code of behaviour can be found in Safety Data Sheets for every single product. Prior to processing of liquid synthetics, it is fundamental to read the safety guidelines on the labels and the Material Safety Data Sheets. To ensure proper and professional handling of products, the professional association of the building industry established a free hazardous material information system. At [www.gisbau.de](http://www.gisbau.de) you can find different product categories and with the corresponding GISCODE (application method) detailed information / operation instructions for the coating material. The GISCODE can be found in the current technical data sheet and the MSDS. While working with liquid synthetics, it is obligatory to wear / use appropriate protective equipment such as goggles, gloves, respirators, suit and also cleaning, protective and care creams. These precautions may reduce possible allergic reactions, health harms and industrial accidents.

### Important information

#### "3-Wheel-Fork-Lift-Trucks"

Floor conveyors, like the fork-lift trucks, are being used in almost all commercial areas. In most cases, the weight of these trucks is distributed on all four wheels while the steering movement is aligned to two wheels of one axle. Three-wheel fork-lift trucks pose a greater challenge. Their weight is distributed on only three wheels and both driving force and steering movement are concentrated on one wheel only. This leads to increased shearing forces during turns and especially when steering while standing still. Only very hard coatings are able to withstand to this strain. As a result, a tough and hard elastic PU-coating, like AB-ZEROPUR 837, is unsuitable. Even highly resistant AB-ZEROPOX- systems show matt, round surface flaws, i. e. damages to the surface, even after sufficient curing of at least 7 days at 18 to 20°C. In combination with inevitable dirt and dust, this leads to claimable damages. Please be aware of the used fork-lift trucks before starting any coating procedure in order to be able to point out possible usability difficulties as well as preparing the driveways for their estimated stress. Please do not hesitate to ask for clarification case by case.



### **AS- and ESD - coating systems**

Using AS- and ESD - coating systems, current standards have to be considered. We explicitly point out that these systems can only ensure compliance with standard norms as long as all necessary parameters are met (conductive shoes, conductive wheels on the truck, comprehensive grounding). Low relative humidity, particularly with underfloor heating, may result in increased static tension / loading for isolating and AS - systems (carbon fibres). Sufficient air humidification can remedy such cases.

The same can be expected with "salt containing" ESD systems too. An underfloor heating will even lead to a loss of the ESD properties! Please consult us.

### **Sealants / topcoats**

The solvent-containing sealants / topcoats are replaced by solvent-free and also aqueous sealants. Due to the raw material, it is not always possible to implement all previously known properties. Also the processing by a different wetting behavior has become more difficult. In the case of solvent-free sealants / topcoats, care must be taken to ensure the specified minimum quantities, otherwise no uniform films can be formed. Aqueous sealants / topcoats must not be diluted too much (water), otherwise sufficient layer thicknesses can't be applied and the properties are greatly deteriorated. The lower the layer thickness, the lower the chemical and mechanical resistance. We recommend a second layer for aqueous sealants. Also, slight surface contamination can interfere with the formation of the film. That is because the emulsifying effect of the solvents is no longer given. The application of sealants / topcoats has therefore become even more demanding and requires intensive preliminary work and planning.

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