



„The dice are thrown!“

AB-COR: Forward - looking corrosion protection with bionic technology

Several years of intensive research and development of AB-Polymerchemie GmbH led to unique generation of corrosion protection systems. Inspired by nature of the phenomenal properties from gecko and mussel, especially their adhesion on different surfaces, even under water, encouraged our research and development department (Team Dr. W. Moroni) for many years of research and successful implementation. These forward - looking "bionic technology" allows an excellent adhesion to many different metal surfaces without corrosion creep, in according once to NORSOK Cathodic Disbonding test. The excellent properties are achieved without a zinc primer!! These facts were confirmed with reports by independent institutions (BAW and SINTEF - Norway) and shows the monopoly position of the qualities on the market. Please have a look at the actual BAW - authorisation.

The development of **AB-COR** - product series initiate a new generation of heavy corrosion protection. These forward bionic technology (VOC < 2 %) achieve an unique long-term corrosion protection (without zinc primer), which led the BAW to make a new classification especially referring to the excellent test results of the **AB-COR 950 SW**. Of course ABP has also tested an AB-COR-zinc primer for thin - film corrosion protection, which is based on the same bionic technology. This product shows in addition to the excellent adhesion and corrosion protection properties an unique cohesion characteristic, which are very similar like galvanising. The **AB-COR** - products are used in all industrial sectors where extremely requirements on corrosion protection are necessary, for example: flood gates, pipelines, steel sheet piles, tanks etc.. These products enable for planner and users new quality standards. The major benefit of the **AB-COR - qualities** is, that they are free of disturbing components like solvents, plasticizers and subsequently rising compounds which disturb the adhesion.

With the **AB-COR** - qualities AB-Polymerchemie GmbH succeeded a milestone in the history of corrosion protection. Especially the excellent chemical and mechanical resistance / properties of **AB-COR 925 HS-A** (DIBt - approved) for interior tank coating and of **AB-COR 950 SW** (BAW - approved) for heavy corrosion protection are emphasised.

Participate also from the progress and protect your objects with the **AB-COR - bionic technology**.

„Bionic“ - we understand

Through the exploration of natural structures, the researcher receive many useful and technical exploitable mechanisms, this is generally referred to as "bionic". Some of these "intelligent" natural systems are based on clever devices, made from simple materials like keratin, calcium carbonate and silica, which nature manipulates into structures of fantastic complexity, strength and toughness. The shell of special **mussels**, for instance, is made out of calcium carbonate, the same stuff as soft chalk. Yet by coaxing this material into walls of staggered, nanoscale bricks through a subtle play of proteins, it creates a protective cover as tough as Kevlar - 3000 times harder than chalk. Understanding the nanoscale structures which are responsible for the living material's exceptional properties is a must critical to recreate them synthetically.

„Gecko Bonding“

The Gecko is a small lizard, one among the best climbers in the animal kingdom. Their ability to walk on walls and ceilings makes them look like they've got super glue coming out of their feet. Indeed the precise footwork based on the fact that the adhesive force depends on how the hairs on the gecko's feet attach and detach from a surface. Gecko toe pads consist of a series of ridges covered with millions of tiny, hair-like stalks called setae. The tip of each seta splits into hundreds of small branches that are capped by microscopic, spoon-shaped structures called spatulae. The foot of a Tokay gecko is covered with 500.000 fine hairs, each tipped with hundreds of projections known as spatulae. Working with single hairs, the strongest attachment results from jamming a hair - and hence the pads on the end of the spatulae - into the surface and then pulling it slightly downward before attempting to detach it. If all the hairs on one foot (each foot approx. 1 Millard!) were attached this way, the adhesive force would total about 100 Newton's. The million hairs contained in a dime-sized spot could lift a child weighing 20 kg. The ability of gecko's to climb on sheer surfaces has been attributed to the adhesion based on van der Waals interactions.



The next picture shows millions of little hairs on the underside of the foot which ends are split into hundreds of even smaller spatula-shaped hairs or "pillars". The interaction between these small hairs (see picture below) and the surface allows the gecko to access the van der Waals force and enabling adhesion.

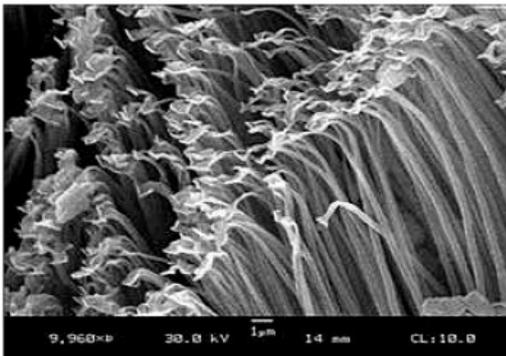


Abb. 1, (picture of: Kellar Autumn, Lewis & Clark College)

The van der Waals forces are the attraction of like particles due to the atom's polarity. These interactions are not merely limited to atomic bonding, but make a molecular adhesion at surface possible too. This force is what keeps the gecko attached to a wall. The adhesive works best when paired with a parallel force, allowing the hairs to grab a maximum surface area. This process is better known as shear adhesion and is the force that keeps gecko's stable at the wall. Researchers have created a gecko-inspired adhesive with ten times the stickiness of a gecko's foot, by combining vertically aligned nanotubes with curly spaghetti-like nanotubes. The gecko's impressive climbing capability suffers, however, in the presence of moisture whereas **mussels have an excellent adhesion to a wet surface.**

Mussel Bonding

The remarkable ability of mussels to stick to almost any surface, even in the presence of water relies on the production of a substance called „Byssus“ by which they attach themselves to the sea bed and thanks to which no storm can pull them off the surface they stuck to. The mussel produces a glue-like material that allows them to cling to rocks underwater - even as waves crash around them.



Mussels accomplish this trick by excreting a protein adhesive that simultaneously displaces water molecules and binds oxygen atoms within it to metallic or mineral atoms. The mussel's adhesive proteins combined with the gecko-like features should result in a comprehensive and effective hybrid adhesive - borrowed ideas from both organisms - have been incorporated into the development **AB-COR** - products based on „bionic - technology of corrosion inhibition“.

The **AB-COR** - coatings turned over a new leaf for the corrosion protection. Due to the specific **AB-COR**-formulations it is possible to prevent sustained heavy corrosion damage and increase significantly the service life of steel structures and buildings. Getting to a successful tank and corrosion protection system means last but not least powerful resistant coating materials, which offer nowadays besides environment - friendly formulation, namely free of plasticizers, solvents and VOC.

Our endeavours: Sustainable improvement of quality, safety, health and environment.

If you don't want to spare in the future in quality and competence "Made in Germany", you should deal more deeply with AB-Polymerchemie GmbH.

Take advantage the unique potential of the **AB-COR** - products and find out for yourself and your customers the quality of our products.

Actual available system's:

	steel tanks DIBt - approved	hydraulic engineering construction BAW - approved	steel construction
Primer:	---	optional* AB-COR 904	optional* AB-COR 904
Coating:	AB-COR 925 HS-A	AB-COR 950 SW	AB-COR 926 or AB-COR 926 LV
UV - sealer:	---	AB-PUR 720 or AB-COR-TOP 971 or AB-COR-TOP 975	AB-PUR 720 or AB-COR-TOP 971 or AB-COR-TOP 975

* "zero / no" corrosion creep was achieved without a zinc-primer in acc. to NORSOK- and BAW - criteria.