PRESSEINFORMATION

Industrieverband Klebstoffe e.V.
Völklinger Str. 4
40219 Düsseldorf
Tel. 0211 67931-10
info@klebstoffe.com
www.klebstoffe.com

What do tigers and guinea pigs have to do with adhesive bonding technology? Or: The EU's paradigm shift in the assessment of adhesive bonding technology

The European Union is planning numerous new measures for the protection of health and the environment as part of its 'Chemicals Strategy for Sustainability' published in 2020. This will have far-reaching effects on European chemicals legislation and thus also on adhesive bonding technology. According to Professor Dr Andreas Groß, Head of the 'Training and Technology Transfer' department at Fraunhofer IFAM (Bremen), this chemicals strategy could lead to a paradigm shift. This means that the previous risk-based assessment of chemicals and hazardous substances (in accordance with the European CLP regulation) could in future be replaced by a hazard-based assessment. This is also a major problem for adhesive bonding technology, because a controllable risk, a controllable tiger, would become a guinea pig.

Schlößer (IVK): In the future, we could face a changeover from a risk-based assessment of chemicals to a hazard-based assessment. At least in public, it seems sensible at first glance, doesn't it?

Groß: But only at first glance! On closer inspection, however, the problem becomes apparent. I fear that the public and political and regulatory decision-makers do not fully grasp the consequences of such a change of direction.

What exactly do you expect to be the problem?

Admittedly, the regulatory approach based on hazard assessment is effective in terms of publicity, not to mention populist: it plays into the sceptical view and prejudice prevalent in

Industrieverband Klebstoffe e.V.
Völklinger Str. 4
40219 Düsseldorf
Tel. 0211 67931-10
info@klebstoffe.com
www.klebstoffe.com

the public that 'chemicals' are fundamentally dangerous. This leads to the widespread belief that, to put it simply, 'chemicals' are fundamentally 'hazardous substances'.

However, you look at it, hazardous substances are and remain hazardous substances...

I will not contradict that, and you will not hear me playing down the issue! However, the key aspect for me is how we deal with hazardous substances in general, including chemicals. Let me illustrate this with an example: water is dangerous as hot steam and a toddler can drown in a one-metre-deep swimming pool. Nevertheless, water is not a 'hazardous substance'. The decisive factors are always the circumstances and the exposure, i.e. being intentionally or unintentionally exposed to external influences.

No objections – but what challenges do you think this will cause for adhesive bonding technology?

Well, more than 500 years ago, Paracelsus – the influential medical personality between the Middle Ages and modern times and the pioneer of pharmaceutical chemistry – formulated a wise insight: 'All things are poison, and nothing is without poison. Only the dose makes a thing not a poison.' This 500-year-old insight is still valid today without reservation. And it will not lose any of its unconditional validity in the next 500 years either.

Ok, but that doesn't explain the feared challenges of a hazard-based approach...

Yes, it does! If, as is undeniably true, 'all things are poison', I cannot avoid a 'poison', i.e. a substance, even a dangerous one. That said, it is not about the substance itself, but about how it is handled.

How would you explain it using an example that is as universally understandable as possible?

Industrieverband Klebstoffe e.V.
Völklinger Str. 4
40219 Düsseldorf
Tel. 0211 67931-10
info@klebstoffe.com
www.klebstoffe.com

Imagine you visit a zoo and look at the tigers. These animals pose a danger, so they are the 'poison' or 'hazardous substance'. The fact that all visitors remain safe is because both the zoo operators and the visitors are aware of the danger. Protective measures have been identified and implemented as part of a risk-based assessment: the tiger, the 'poison' or 'hazardous material', is kept in a cage. This means that you, I and everyone else will not come into contact with the 'poison' or 'hazardous material', i.e. the tiger, under foreseeable conditions and if we all behave as we should.

If, on the other hand, we look at the tiger in its natural habitat, the jungle, nothing changes with regard to the 'poison' or 'hazardous substance' tiger. A visit to the zoo also does not change the danger posed by the tiger. What does change dramatically in the jungle, however, is the risk of coming into contact with the 'poison' or 'hazardous substance' tiger. This is because the protective measures for minimising risk, which logically result from a risk assessment, are absent in the jungle.

I see – so it is decisive to avoid any contact that poses an unacceptable risk. But what exactly is the challenge in the hazard-based approach?

That's easy! I'll stick with this example: the tiger, i.e. the 'poison' or 'hazardous substance' is simply prohibited in a risk-based approach. Full stop! Mind you, even in the zoo! And that despite the fact that risk-minimising protective measures are in place there that are verifiably effective, and despite foreseeable circumstances and proper behaviour. Of course, we would still be free to continue going to the zoo. It's just that we wouldn't be able to see any tigers anymore – because they are now banned there as 'hazardous substances'.

That means the tiger cage will going free...

...e.g. for guinea pigs. The 'poison' or 'hazardous substance' tiger is simply replaced by a 'non-poison' or 'non-hazardous substance', for example in the form of guinea pigs.

Industrieverband Klebstoffe e.V.
Völklinger Str. 4
40219 Düsseldorf
Tel. 0211 67931-10
info@klebstoffe.com
www.klebstoffe.com

Transferring this approach to hazardous substances sounds somewhat strange, to say the least...

... that's right, the paradigm shift from the proven and successful risk-based assessment to the hazard-based assessment means that the 'hazardous substance' is being banned – no ifs, ands, or buts! And, fatally, without an assessment of the consequences from other points of view.

At least the issue of 'residual risk' would be resolved once and for all, wouldn't it?

Yes and no. Take formaldehyde, for example, which occurs in wood, among other things. Formaldehyde is a 'hazardous substance'. Prohibiting it does not eliminate the residual risk. When we go for a walk in the forest, we can measure concentrations of formaldehyde that occur naturally there. Consequently, we are exposed to this.

Furthermore, we simply have to accept that we have to live with residual risks in all areas of our lives, regardless of 'hazardous substances'. You can make your house or apartment burglar-proof. However, you cannot exclude the residual risk of a break-in. Even when flying, e.g. on holiday, there is a residual risk, despite the highest safety standards in aviation. If you cross the road as a pedestrian, however carefully, there is a residual risk. Even when visiting the zoo to see the tigers, there is a residual risk: you trust that the cage is securely locked and that you will not come into contact with the 'hazardous substance' tiger

What does this mean for adhesive bonding technology?

It's quite simple! Let's replace the 'hazardous substance' tiger with a 'reactive adhesive', e.g. based on epoxy resin. With the risk-based regulatory approach for hazardous substances prevailing today, this adhesive is used successfully in compliance with the necessary safety requirements for avoiding contact and hazards, and with minimal residual risk in technological, economic and ecological terms. If the approach to regulation were hazard-based, however, the epoxy resin adhesive would simply be banned!

Industrieverband Klebstoffe e.V.
Völklinger Str. 4
40219 Düsseldorf
Tel. 0211 67931-10
info@klebstoffe.com
www.klebstoffe.com

What would be the consequence?

Of course, we would still be free to use adhesive bonding technology. Just as we can continue to go to the zoo in the future. It's just that we'll only be allowed to visit the guinea pigs there, and we'll only be allowed to use 'non-hazardous substances' in the form of 'kindergarten adhesives' for adhesively bonded joints. With 75-metre-long rotor blades in wind turbines, or with windscreens in cars or high-speed trains that are essential for safety, we'd better not do that!

So we have to stick with a risk-based approach to regulation if we don't want to hinder technological development...

I consider this to be absolutely essential! By maintaining the risk-based assessment approach, politicians have the opportunity to do exactly what they are supposed to do. They must create framework conditions that refocus on the utilisation of what is internationally technically possible and necessary. This is precisely the key prerequisite for innovation and for enabling innovation in our country and in Europe. Let us be clear about one thing: adhesives are not used because it is 'chic' or 'hip' or 'modern'. Adhesive bonding technology is used to meet technological, ecological and economic product requirements that can best be met, or only met, by using adhesive bonding technology.

What would happen if we evaluated and used adhesive bonding technologies based on hazards in the future?

Our technical possibilities would be limited in the foreseeable future. After all, in almost all areas, from cars to dental crowns, from micro to macro, under water, on water, on land and high in the sky, adhesives are used, even in space. Today, there is hardly an area in which adhesive bonding technology is not or does not have to be used. Adhesive bonding also supports other goals that are currently in focus in the context of sustainable product design.

Industrieverband Klebstoffe e.V.
Völklinger Str. 4
40219 Düsseldorf
Tel. 0211 67931-10
info@klebstoffe.com
www.klebstoffe.com

Adhesive bonding of windscreens is just one example. Adhesive bonding technology turns the window into a structural element. The adhesively bonded joint contributes to weight reduction by increasing the rigidity of the vehicle. In other words, if the windows were installed mechanically, as they were in the past with rubber seals, the car would be significantly heavier.

Another example is the use of adhesive bonding in the car body-in-white. Here it contributes to passenger safety. In the event of a head-on crash, the adhesively bonded joints hold the parts together. This means that the energy of the impact is absorbed in the engine compartment and does not pass into the passenger area.

Adhesive bonding is also an important enabler for the targeted energy transition. The rotor blades of wind turbines are purely adhesively bonded constructions. Any other joining technology would minimise the energy yield to such an extent that wind energy would no longer be an option. In fact, the development of alternative energy sources would be unthinkable without adhesive bonding technology given the current state of the art.

And we would quickly be limited in our digitalisation efforts as well. The IT hardware only works as well as it does because of adhesives, which are used as a joining technology and, increasingly, for heat management. This also applies to smartphones and other mobile devices. Here, too, it is the adhesives that make it possible to meet the ever-increasing demands in the first place.

Thank you for the numerous examples. So, the risk of technological regression would be high and future developments in these and other areas would be significantly more difficult, right?

Yes, but at this point I would like to address another important point: it is important that we do not approach this topic superficially or polemically. The Commission's proclaimed 'toxic-free environment for Europe' is simply utopian. As I said at the beginning, even today it is still

Industrieverband Klebstoffe e.V.
Völklinger Str. 4
40219 Düsseldorf
Tel. 0211 67931-10
info@klebstoffe.com
www.klebstoffe.com

fully valid: 'All things are poison and nothing is without poison'. Consequently, it is de facto impossible to exclude residual risks. Minimising them – that is our responsibility and thus the central challenge. For me, this means that in Germany and for Europe, the utilisation of what is internationally technically possible and necessary must again be at the forefront when designing framework conditions, and this must be done by weighing up the risks. And this risk-weighing process – for example in adhesive bonding technology, but certainly not only there – is made possible by the proven risk-based assessment. On the basis of existing regulations, it minimises unavoidable residual risks. In doing so, it takes into account the effects on health and the environment in a way that serves as a global model. And at the same time, it leaves room for necessary innovations.

In contrast, hazard-based assessment is the exact opposite: it only creates bans and 'stifles' urgently needed technological developments with these bans. And it does not lead to 'toxic freedom' either. A 'toxic-free Europe' is, as already mentioned, utopian. A 'toxic-free Australia', a 'toxic-free Africa', etc. are, logically, also utopian. The same applies to the complete exclusion of residual risks. This is also nothing more than a utopian ideal.

One argument in favour of a hazard-based approach to assessment would be the possibility of reducing bureaucracy and regulation. How do you see this?

A prime example of superficial analysis! I am not disputing the fundamental goal of reducing bureaucracy and regulation. However, the reduction of these and the resulting demonstrable improvements and simplifications for authorities and companies must no longer be repeated like a prayer wheel. They must be implemented quickly and tangibly! This also applies to the chemicals strategy. Bureaucracy and regulation must be reduced to a manageable level in all areas.

The question is how. At first glance, a hazard-based assessment may seem to many people to be a suitable instrument. Along the lines of: Prohibition is easier than assessing risks, and above all, it is less bureaucratic! To stick with my zoo analogy: Replacing all animals with cuddly toys also means that our industrial future in Germany and Europe will look different.

Industrieverband Klebstoffe e.V.
Völklinger Str. 4
40219 Düsseldorf
Tel. 0211 67931-10
info@klebstoffe.com
www.klebstoffe.com

That would be aimless disruption in its purest form.

Therefore, there is absolutely no way around maintaining the proven risk-based approach. In this context, the focus on the utilisation of internationally technically possible and necessary measures for creating framework conditions must once again be the central focus – including in the chemicals strategy and for adhesive bonding technology. Returning to this is a central task for politics.

Thank you for the interview, Professor Dr Groß.

Further information: www.klebstoffe.com, www.klebstoffe.com/presse

About the German Adhesive Association (Industrieverband Klebstoffe e. V. - IVK):
The German Adhesives Association (Industrieverband Klebstoffe – IVK) represents the economic and technical interests of the German adhesives industry in relation to the public, authorities, consumers and scientific institutions. The IVK has more than 155 member companies, including manufacturers of adhesives, adhesive tapes, sealants and adhesive raw materials, as well as scientific institutes and system partners. The German adhesives industry employs around 18,000 people.

Picture_01: Tiger

Foto: © winterseitler auf Pixabay

Picture_02: Guinea pig

Foto: © Vantage Point Graphics auf Pixabay

Industrieverband Klebstoffe e.V.
Völklinger Str. 4
40219 Düsseldorf
Tel. 0211 67931-10
info@klebstoffe.com
www.klebstoffe.com

Picture_03: Prof. Dr. Andreas Groß

Foto: © Fraunhofer IFAM

Note: The image material is only released for editorial utilisation and may only be published in connection with the associated press release. The Industrieverband Klebstoffe e.V. must be visible as the author of the press release.

We are happy to provide you with information:

Industrieverband Klebstoffe e. V. (German Adhesive Association)
Dr. Vera Haye
Völklinger Str. 4
D - 40219 Düsseldorf
Phone +49 211 67931-10
Fax +49 211 67931-33
info@klebstoffe.com
www.klebstoffe.com