Hail - a natural hazard that you can protect yourself from

From the detection of loss potential caused by hail events using K.A.R.L.® to active risk management by means of hail nets

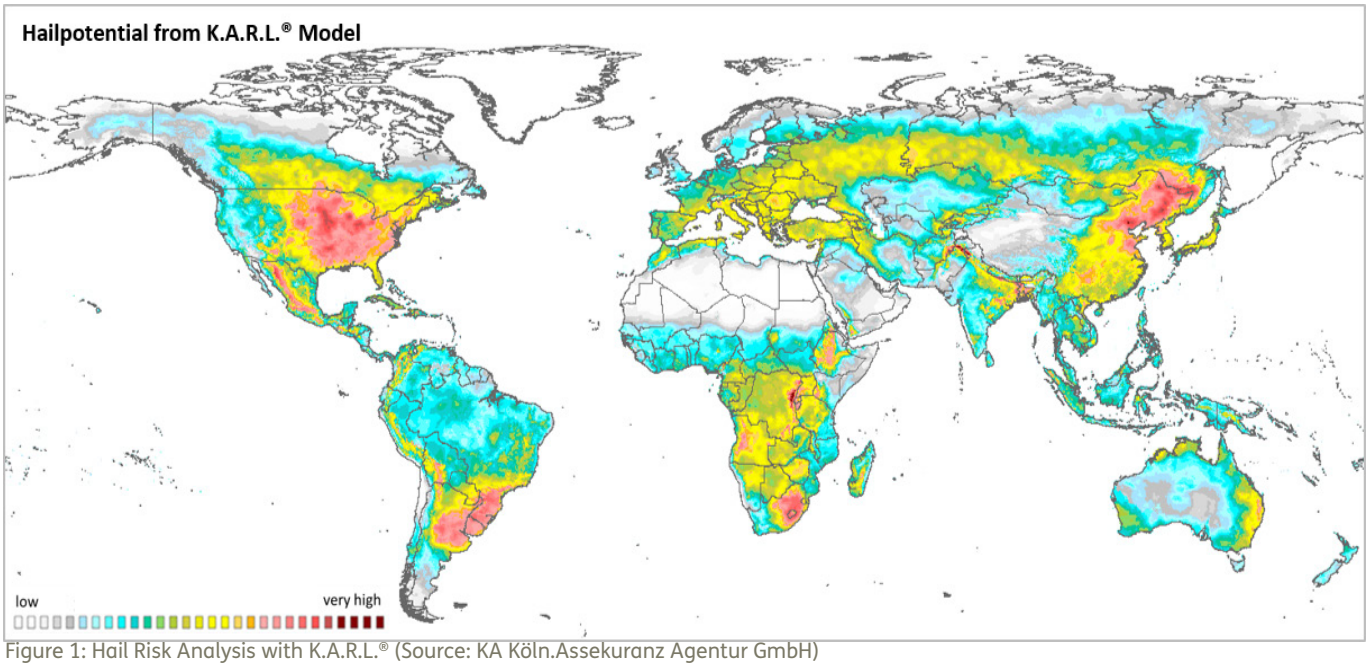

Figure 1: Hail Risk Analysis with K.A.R.L.® (Source: KA Köln.Assekuranz Agentur GmbH)

Many car owners have already experienced the consequences of a hailstorm at some point in their life - instead of sparkling smooth sheet metal, the car is covered with many large and small dents. After major events such as in 2019 in Munich, when the media response is huge - not only cars, but also house facades, roofs and windows will be affected. Entire annual harvests in agriculture can be threatened e.g. in the apple plantations near Lake Constance. And a large hailstorm can cause considerable losses on open storage spaces for vehicles - then several thousand vehicles are damaged at the same time. As a long-standing player in marine cargo insurance for the German automotive industry, KA Köln. Assekuranz Agentur GmbH has repeatedly experienced the consequences of such hail events and managed their regulation.

These events do not appear completely by surprise. With the natural hazard analysis tool K.A.R.L.® the risk of hail can be determined worldwide. Figure 1 shows the global distribution of hail potential based on the hail model of KA Köln.Assekuranz, which has been in service since 2008 and was extensively modernized in 2019. Since the first K.A.R.L.®-analyses, hail potential has been modelled using climate data including the frequency of lightning. Historical loss data for hail, which cannot be systematically recorded worldwide, only serve for calibration of K.A.R.L.®.

Techniques to remove dents from vehicles after hailstorms – so called paintless dent repair (PDR) – have been developed rapidly in the past decade. By using standardized procedures, vehicles can nowadays be restored more quickly and significantly cheaper. In addition to many local repair companies like „Smart Repair“, a handful of globally operating companies have been established as partners to automotive manufacturers and insurers.

But why not prevent damage altogether? From a certain level of hail probability and exposure on an open storage space, the investment in hail protection can be easily recovered.

The Risk Managers of KA Köln.Assekuranz have seen a large variety of different solutions during their inspections of several hundred storage locations worldwide. From a risk management point of view, “hail shooting”

by means of cannons or the "injection" of thunderstorm cells by small aircraft are pointless and serve the purpose of reassuring rather than having any actual measurable effect. Protective mats that must be applied individually to each vehicle are not convincing in terms of handling on an industrial scale. Not to mention the damage to the car paint under the mats if dust and sand were previously present on the cars. The focus should be more on covering parking spaces by using hail nets. Since there is only very little information regarding the quality of these solutions available, KA Köln.Assekuranz has initiated several projects that take a holistic approach. One of them was a project competition among students from the transport / logistics course at the Bremerhaven University of Applied Sciences.

The managing directors of the KA Köln.Assekuranz Agentur Karl-Heinz Schmidt and Bastian Biswurm are impressed by the results: "We are probably the first colleagues in marine cargo insurance who have approached the topic of hail protection holistically and scientifically."

Figure 2: Pleased about a successful project competition - students and university lecturers from the transport / logistics course at the Bremerhaven University of Applied Sciences as well as representatives of the KA Köln.Assekuranz Agentur (Source: University of Applied Science Bremerhaven)

The students taking part in the competition analysed the existing market offers for hail nets. They convinced themselves of the functionality as well as the limitations of different hail nets in the course of laboratory tests by using a hail impact cannon. The project results submitted by the students were assessed by a jury with representatives from the two cooperation partners and were given awards. The student Louisa Ottens, who is studying transportation / logistics in the fifth semester, was delighted with the award for the first place. The prize for the second place was awarded to a project group (Philipp Wietbrok, Lars Wöltjen, Marcel Schairer and Christoph Poll). "We are very pleased with the results of the cooperation with KA Köln.Assekuranz Agentur in the project competition and would be very happy about any further future projects." said Prof. Dr. Eng. Dieter Heimann, beaming with satisfaction at the end of the project competition.

To our relief, the practical tests did not show any real failures. For this purpose, selected hail net samples were tested under constant load together with the technical inspection association TÜV Rheinland and the limitations were checked using a hail impact cannon. However, typical weak points have emerged concerning several providers. Often these were the mountings and suspensions that can be subjected to higher loads when large hailstones impact. Special attention must be paid to those and to the preload of the net when developing local protection concepts. The manufacturers of such systems have solved the problem of emptying hail nets in very different ways. The most efficient systems are those that allow controlled relief - otherwise, unwanted stress quickly arises at the drainage zones or unnecessarily thick and cost-intensive materials have to be selected.

"The examination of hail nets alone is not enough, it depends on an entirely consistent system. The weak points are often the fastenings and suspensions", explains Dipl. Ing. Jürgen Sommer from TÜV Rheinland.

Also, local climate conditions have to be considered - how long does the hail season last? How much pressure from storms, or factors like UV radiation or frosty and snowy winters that must be taken into account when choosing the system and its mounting? Due to the significant investment, the lifespan of an effective hail protection should be maximized. Loose strings (from a former hail net) dangling from a frame, like recently encountered on a southern European storage area, cannot have any positive effect on hail protection.

Together with its clients, often from the automotive sector, KA Köln.Assekuranz can use the K.A.R.L.®-analyses and its well-founded insurance expertise to prepare financially comprehensible decisions and support them in the design and selection of hail protection. In

the end, the customer wants a new vehicle to be delivered on time. And for the car manufacturer, a large number of damaged vehicles cause many encumbrances in logistic processes and of course additional costs. Matthias Müller, Head of K.A.R.L.®-Team and Sebastian Kempka, Consultant in the Nautical/Technical Risk Services are the contact persons at KA Köln.Assekuranz: „With a K.A.R.L.® site analysis, we assess the hail risk at our customers‘ locations and significantly reduce this vulnerability with a tailor-made protection concept.“

Figure 3: Hail impact cannon in the test laboratory (Source: TÜV Rheinland)

Information about the KA Köln.Assekuranz Agentur GmbH

KA Köln.Assekuranz Agentur GmbH is a 100% subsidiary of ERGO Versicherung AG and an expert in the analysis and protection of industrial risks in the fields of marine cargo and group accident insurance. We have the expertise of a lead insurer and, as an underwriting agency, offer tailor-made insurance protection and a wide range of risk service solutions.

Global trade poses new challenges to our transport insurance customers: long, complex transport chains with many interfaces, goods deliveries to areas with difficult infrastructure or organized crime can cause considerable damage. Goods can be lost, destroyed, damaged or stolen. This is where we start: Our experts carefully assess the risks in advance and help to minimize dangers. We recognize, for example, disruptive factors on transport routes, check warehouse locations or check whether packaging is suitable. Our team of experts develops solutions for the technical securing of transports and supervises project loading. We also offer special service solutions for classic insurance products.

The combination of the K.A.R.L.® system developed by KA Köln.Assekuranz, with which natural risks worldwide can be detected, analysed and quantified precisely, and the expertise of experienced geoscientists also enables us to provide customers with comprehensive, specific and personal advice on all topics related to the ubiquitous natural hazards.

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