difference

THE KÄRCHER MAGAZINE

02 | 2019

GETTING TO IT

Then and now

MARITIME TRADITION
Lobster fishing in Scotland

WHAT WE STAND ON
Interesting facts about floors

PLASTICS MAKE A COMEBACK
Recyclates in spray lance production

› 02 | 2019

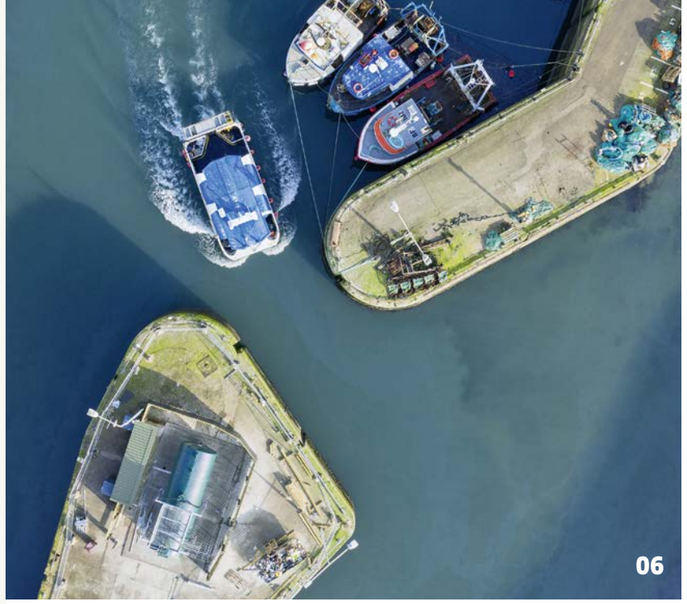
Dear readers,

In this magazine we focus on craftsmanship, one of the most traditional professions of them all. Our company also has its roots in craftsmanship, and so Kärcher machines have always been used daily in many companies. In this edition we also highlight the fruitful relationship of two supposedly opposing partners: collaborations between traditional companies and start-ups and how they can innovate together.

Did you know that when it is recycled, plastic can make a positive contribution to the sustainable handling of resources and and thereby help to solve the global waste problem? On the following pages we show you, amongst other things, how spray lances for our high-pressure cleaners are made from discarded airbags.

I hope you enjoy these exciting insights and have fun reading this edition of difference!

Hartmut Jenner
Chief Executive Officer and Chairman
of the Board of Management
Alfred Kärcher SE & Co. KG



Facts and figures

GET TO IT AND CREATE NEW THINGS

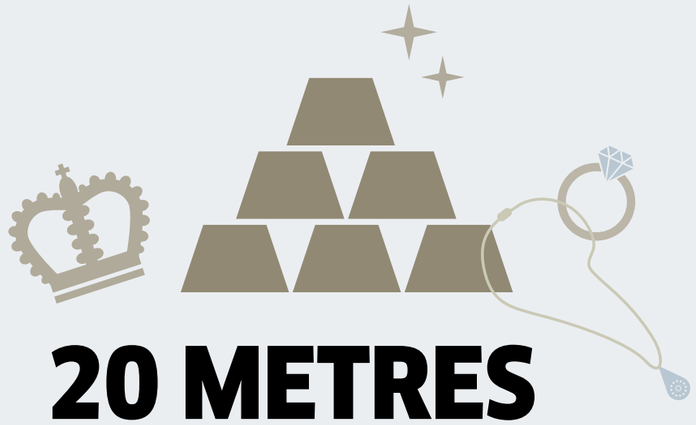
In everyday life we encounter a variety of different raw – and other – materials. Where they come from and where they go – a selection.

500 KG

OF CHARCOAL: IN THE PAST, 15 DAYS WERE REQUIRED FOR ITS MANUFACTURE.

Charcoal manufacturing is steeped in tradition. Its peak period was from the Middle Ages to the start of industrialisation. Charcoal was traditionally manufactured from beechwood in many elaborate production steps. For 500 kilograms of charcoal, a charcoal burner must stack up almost 20 cubic metres of chopped beechwood; five days were needed for this alone. This was followed by another ten days of waiting for the charcoaling process to be completed.

You can host roughly 3,000 barbecues with 500 kilograms of charcoal. After the barbecue comes the unpleasant task: cleaning the grill grate. Good results can be achieved with a steam cleaner. A round brush with brass bristles at the nozzle and the power of the hot steam can easily remove even the most stubborn dirt. The cooled ashes can be easily vacuumed up using an ash and dry vacuum cleaner.



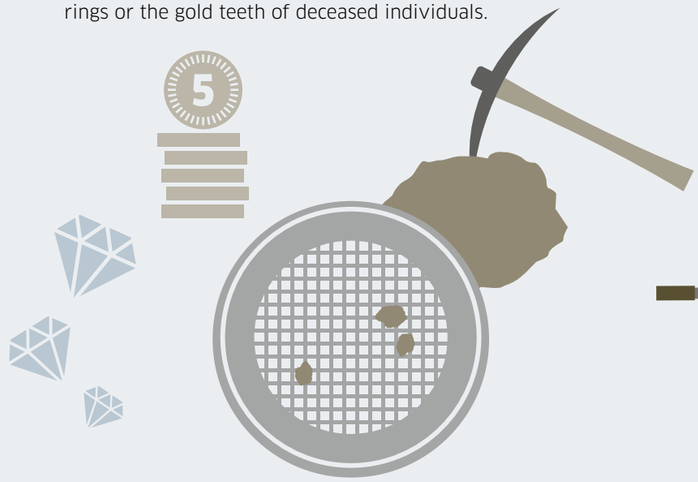
20 METRES

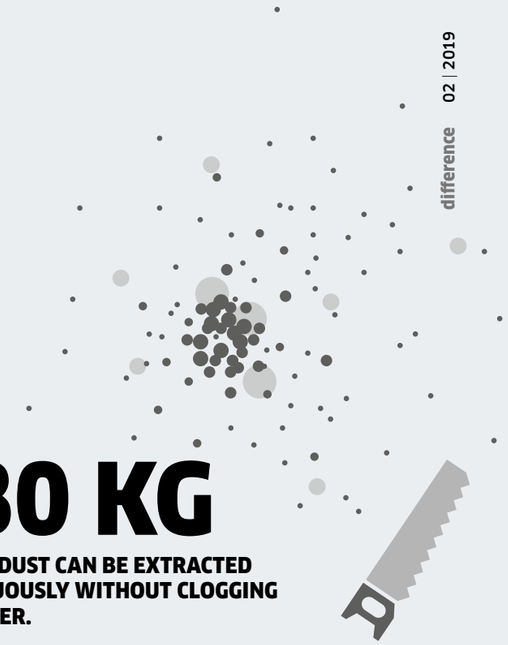
WOULD BE THE EDGE LENGTH OF A CUBE MADE OF ALL THE GOLD THAT HAS BEEN MINED THROUGHOUT HISTORY.

It is thought that, to date, roughly 155,500 tons of gold have been mined worldwide – that sounds like a lot, but when melted down it would only be a cube with an edge length of 20 metres.

We encounter the material most frequently in elaborate forms – processed by **goldsmiths** to make jewellery. This share accounts for over half. Next, some way behind, are works of art, in which 12 percent of the gold can be found. A small proportion, roughly 150 tons per year, is used in the manufacture of electronic devices. Small connecting wires for computer chips are in PCs, washing machines or TVs. In professional cleaning one also relies on the use of valuable materials: for example, diamond particles are processed into pads that have been tried and tested for grinding and polishing floors. The pads are suitable, for example, for marble, terrazzo, epoxy floors and other hard surfaces that can be polished. The fine diamond particles, which are only fractions of a millimetre in size, stick to the fibres, remove the dirt and ensure an excellent shine.

And at the end? It is thought that roughly two percent of the gold makes its way back into the ground after many years – in the form of wedding rings or the gold teeth of deceased individuals.





180 KG

OF FINE DUST CAN BE EXTRACTED CONTINUOUSLY WITHOUT CLOGGING THE FILTER.

On construction sites **bricklayers, plasterers, joiners and carpenters** deal with dust from various materials: wood, concrete, cement or stone. Depending on the size of the particles, they can linger in the air for up to 5 days before they settle or, in the worst-case scenario, are inhaled, which may consequently cause diseases. Dust is best removed as it is created, using a suitable extractor. Even with the smallest wet and dry vacuum cleaner with automatic filter cleaning, 180 kg of fine dust can be extracted continuously without clogging the paper or rot-proof polyester fleece filter. For comparison: almost 20 kilograms of household dust accumulates in a year in an average household of a industrial Western nation.

The lobster fisherman of Pittenweem

A LIFE FOR THE BIG CATCH

Each day fishermen sail out from the harbour in the small Scottish village of Pittenweem on the Firth of Forth estuary on the North Sea coast and catch lobsters and brown crabs. The work is hard, but nobody here would change it for the world.

When the sea is calm, it is the most beautiful place in the world.

Nick Irvine

Every day dozens of lobster traps are gathered, emptied and filled with new bait.

By the time Nick Irvine finally sets sail in his Vanguard, he has already carried out a huge amount of work: he has cleaned the ten-by-five-metre catamaran, bought new bait at the fish market and checked the tank as well as the weather and sea charts. He has also already pulled the thick rubber boots and yellow waterproof trousers over his threadbare camouflage cargo pants and a blue waterproof jumper over his thick hoody.

"I can't imagine having any other life than that of a fisherman," says the 44-year-old Scot, who has spent his entire life on the Firth of Forth, an estuary located on the east coast of Scotland, a good hour's drive away from Edinburgh. An office job? "A horrible idea," he says. Move to a large city like Edinburgh, Glasgow or Aberdeen? "No – too many people, not enough space, far away from my family." But above all: "I would no longer have the sea right on my doorstep."

400
LOBSTERS
ARE CAUGHT BY THE FISHERMEN ON ONE DAY IN THE SUMMER.

Nick always wanted to be a fisherman

And that has been his life, his fascination, since he was a young boy. "When I was ten or twelve years old, I was already going out fishing, before and after school." He didn't inherit this fascination for the back-breaking job from his parents. "But my brother is also a fisherman. Together, we own five boats," says Nick.

And they go out on the boats almost every working day, in summer and winter. "We take a break at the weekend," he says. Nick has deposited around 400 lobster traps off the North Sea coast. Each day dozens of them are collected, emptied and filled with new bait – a tiring job that he completes with his crew, Josh and Roger. "When the sea is calm, it is the most beautiful place in the world," says Nick with enthusiasm. However, it is often windy here, it is cool, even when the sun is shining, and the water is rough. "But you get used to it very quickly."

In winter, the lobsters do not move much

The traps are lowered into the sea at various locations. The sonar on board provides information about the underwater landscape because it is better to leave traps in areas of water where the seafloor is hilly. "This is where the lobsters prefer to move about and they will simply walk into our traps," explains Nick. But this only happens in summer when the water temperature reaches more than ten degrees, even at greater depths. "In winter, the lobsters all but stop moving," says Nick. No wonder: at that point the water in the North Sea is rarely warmer than three or four degrees – the crustaceans are in survival mode.

Everything happens very quickly once Nick reaches one of his buoys. He pulls in the rope through a large slot. Roger

5 FACTS ABOUT SCOTLAND

- Scotland is 78,772 square kilometres in size and its capital is Edinburgh.
- "Haggis" is the national dish of Scotland, but it is not to everyone's taste: the classic recipe involves a sheep's heart, lung and liver being cooked in the animal's stomach.
- Scotland has nearly 800 islands, of which 130 are inhabited.
- "Harry Potter" is set in Scotland, amongst other places.
- The raincoat was invented in 1824 by the Scottish chemist Charles Macintosh. In Great Britain this item of clothing is still often called a "mac".

Sometimes people wait for us on the quay and buy lobsters straight from the boat.

Nick Irvine

Dirt on board can be easily removed using the hot-water high-pressure cleaner. The push sweeper ensures a clean pier.

LOBSTERS LIKE THINGS CLEAN

Fishing is a strenuous affair – and one that demands maximum cleanliness: The deck, the troughs for the catch, the hull, the ropes and particularly the traps. Because: Lobsters have good eyes. It is an advantage when the cage has no algae and they can already recognise the bait from some distance.

and Josh are ready for the cages that their boss pulls out of the water. They are heaved onto a table and, while Roger uses his trained eye to select the brown crabs and lobsters that are suitable to go to the market, Josh takes a handful of dead fish from the crate and stuffs them into small bags in the traps.

They are to be used to attract the crustaceans. "Once the lobsters enter the traps because they have seen the fish, they cannot get back out again," explains Nick. Inside, the traps are like a small labyrinth, and the lobsters cannot escape from the rearmost chamber.

While Roger throws the by-catch, such as mussels, starfish or other sea creatures, back into the water, Nick gets the next trap on board and Josh heaves the emptied cage to the adjacent free area. The traps are stacked here until the entire catch from one location has been gathered.

In the summer, the lobsters stack up in the traps

"In the summer we catch up to 400 lobsters a day, sometimes even more," says Nick. This is because the cold North Sea at the Firth of Forth is full of these shellfish. Each fisherman has their spots where they throw out their traps. "We don't get in each others' way." And they do not need to, because once back on shore, they hand their catch over to a cooperative that sells the shellfish on.

Nick explains that many lobsters and crabs are sent directly to Asia and Spain. There, distributors get good prices for catch from Scotland. Fish are harder to sell. "That's also the reason why we specialised in lobsters and crabs – nothing else is worth the effort."

3°

WEST:
PITTENWEEM HAS THE SAME LONGITUDE AS MADRID.

Selling lobsters straight from the boat

In the summer, even Scottish people are enthusiastic about the precious shellfish that the fishermen get from the sea. "Sometimes, people wait for us on the quay and buy lobster straight from the boat." This is not a problem since they bring more than enough catch to shore. "Sometimes the traps are so full that the creatures are almost stacked on top of each other inside them."

When Nick finally sets a course back to Pittenweem, the working day is over for his two helpers – but the captain brings the catch to the buyers and starts to prepare the catamaran for the next day. The harbour houses a professional hot-water high-pressure cleaner from Kärcher, which makes it a lot easier to clean the deck. "We purchased the machine as a group, and it was an excellent investment," he says. Nick cleans the thick ropes of his Vanguard using the machine, which can heat water up to 155 degrees. After a long day at sea, the ropes are a brownish colour but, once the hot-water high-pressure cleaner is used, they gleam in a deep bottle-green colour. Once the boat is clean, Nick turns his attention to the pier. He uses a Kärcher sweeper to collect the rubbish that is produced when loading and selling the lobsters and crabs.

After chatting to his fellow fishermen, Nick stops by the small ice-cream stand on the promenade and treats himself to an ice cream. He then makes his way home to his wife and daughter. Time to relax. ■

Video of the lobster fisherman of Pittenweem
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Craftsmanship and cleaning technology

TWO WORLDS, ONE GOAL: PERFECTION

Kärcher at home on the patio. Kärcher in building cleaning. People most often think of these two areas of application when it comes to vacuum cleaners, high-pressure cleaners, etc. But it is hard to imagine everyday life without many Kärcher products, especially for workshops. Using the example of a construction site, we show where reliable cleaning technology matters and why, at the same time, the focus is on occupational safety and the protection of health. Also in the spotlight: how, over the last few decades, the model builder at Kärcher became the prototype engineer, and what traditional and modern craftsmanships there are all around the world.

Clean construction trade:

FROM STRUCTURAL WORK TO DREAM HOUSE

Excavation for the floor slabs, pouring the foundation, building walls, covering the roof, completing all aspects of the interior fittings: when a building is constructed, various trades have to work alongside one another, sometimes under tremendous time pressure. So it is all the more important that the cleaning technology used does what is needed – at all times, reliably and even in the toughest of environments.

Important for health and quality: wet and dry vacuum cleaners for dealing with dust particles

One of the greatest enemies on every construction site is extremely small: dust. And it is everywhere. When joiners and carpenters are working on the roof or busy working on the interior construction, wood is sawn and cut. Holes are drilled, and the circular saw is only seldom not in use. Dust and chippings fall to the ground and are distributed in the air. As soon as the roof is ready, the electrician can get to work. In order to lay cables and lines, he must make slots in walls and floors using a cutter. Fine concrete dust falls from the crevices at every stage of the process. It's a similar story when the plumber starts the sanitary installations. Drilling and chiselling work takes place when pipes and lines are installed through floors and out into the open. Many kinds of dust are created at this stage, too – such as concrete, brick or plaster dust – before the bathrooms etc. are ready for use.

On the one hand, the fine dust particles get in the way of the work – if the worker can no longer see his hand in front of his eyes, then good quality can hardly be delivered. On the other hand, the fine dust is harmful to the worker's health as it sits in the lungs. Depending on the region, there are therefore strict regulations in place in order to guarantee the necessary occupational safety. The technology used should not only effectively combat the dust, but also make tough day-to-day work easier and not be an additional burden.

The cleaning machine of choice should definitely be a wet and dry vacuum cleaner because only these machines are able to deal with the mixture of dry and wet dirt that workers are faced with on construction sites. Even with these special vacuum cleaners, the filters clog quickly, which is why models with automatic filter cleaning facilitate uninterrupted work. If lightweight, robust and – where appropriate – battery-powered machines are selected, to which any power tool can be directly connected, then dust becomes a thing of the past.

Final construction cleaning before moving in: vacuum sweepers and scrubber driers for all situations

Despite the tireless efforts of dust control technology, when all the work is completed, there is still always a great deal of coarse dirt around, such as splinters of wood or pieces of plaster. Such loose dirt, in both interior and exterior areas, can be removed using battery-powered push vacuum sweepers. If larger areas have to be cleaned, then ride-on or even industrial sweepers are much faster and more efficient in use. For interior cleaning, scrubber driers can then be used – depending on the area – in order to wet clean the floors with the advantage that the loosened dirt is picked up straight away, the floors are quickly dry again and are therefore safe to walk on. Now and then parquet layers are needed again at the very end, for example to seal wooden floors. With this final touch, the rooms are then more than well swept and therefore ready for occupancy.

The icing on the cake in green areas: landscaping and garden maintenance with battery-powered machines

Depending on the property size, work on the house is accompanied by the creation of a beautiful garden. Landscapers arrange lawns, trees, bushes, etc. often in an artistic manner; flower beds and fountains or ponds are also planned. Strictly speaking, cleaning technology hasn't lost out on much here, but related machines certainly have. In order to give the surrounding green area the appropriate design, nowadays mostly battery-powered strimmers, chainsaws and hedge trimmers are used. They are much quieter and give off no emissions. Depending on the manufacturer, they also create much less vibration, which is more ergonomic for the operator overall and, in particular, puts less strain on the circulation. As the machines are very compact, even putting precise finishing touches to narrow, tucked-away corners of the garden is not a problem.

Value preservation for tools, etc.: high-pressure cleaners for dealing with coarse dirt

On the construction site, not only workmen and cleaning technology are exposed to high stresses – the tools, machines or the scaffolding for the painting work also withstand dirt and continuous use. It is therefore important that every workshop keeps the equipment it uses in good condition and ensures the longest possible service life. Cold and hot water high-pressure cleaners of various sizes and performance classes are exactly the right solution for this job. The water volume and pressure can be set precisely to the respective requirement so that both gentle and powerful cleaning can be carried out. ■

Find out more about craftsmanship and cleaning technology:
www.kaercher.com/difference

Modern craftsmanship at Kärcher:

FROM MODEL BUILDER TO PROTOTYPE ENGINEER

If you look at the world through the eyes of a prototype engineer, then above all one thing has changed in the last 30 years: whereas in the past cars or coffee machines were square, today everything has curves and bevels – almost to such an extent that people want corners and edges again. How craftsmanship, technology and design language at Kärcher have undergone a significant change – a journey through time.

Sheet metal punch, lathe and cutter, heavy push machines and all sorts of noise. This was model assembly at Kärcher around 30 years ago. Even back then the components of all the products were made as models. After that, even today, the model goes to the test workshops for assembly so that the developers can identify optimisation potential and make improvements. This type of product development has been tried and tested, which is why the company has always invested a lot in the process and the individual production steps.

Very early on, a CNC milling machine was available to the model builders, which allowed them to work significantly faster than if they had used conventional milling and filing processes. At the start of the 1990s computer-aided 3D design was introduced to the development process (editor's note: CAD = computer-aided design), which allowed new shapes, curves and bevels to be used in the planned products. But now it was time to implement this CAD data and operate the milling machines and lathes accordingly. A CAM programme was implemented (editor's note: CAM = computer-aided manufacturing) in order to translate the data for the machines to a certain extent by using software. Alongside classic trade expertise, it was now becoming increasingly important in model construction to be a qualified programmer, in order to keep up with all the changes, both in the real and the virtual world.

In 1997 Kärcher became one of the first companies in Germany to purchase a 3D printer. In 1998 the first components were made and the so-called rapid prototyping was born – and with it the transformation from model builder to prototype engineer was complete. Today the team has access to four rapid prototyping systems and four machining centres in order to manufacture several hundred components per week for all areas of the company. ■

INTERNATIONAL CRAFTSMANSHIP: FROM PRAYER BEADS TO GLASS ART

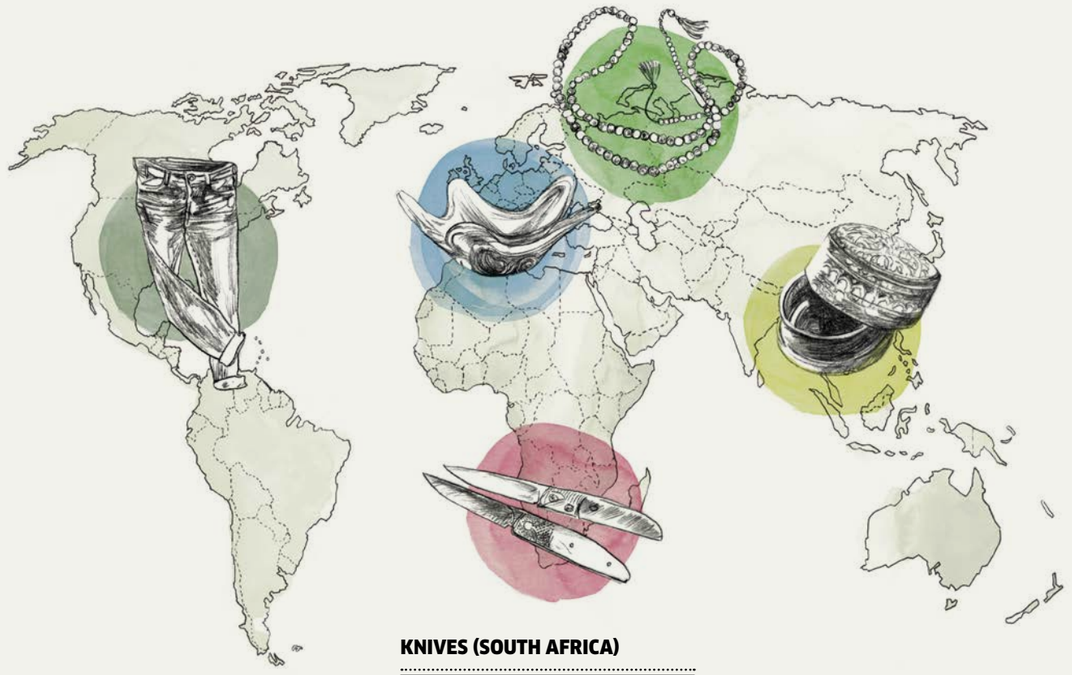
Craftsmanship is as old as the hills and state of the art – because we have enjoyed the gift of creating and designing things with our hands and using tools since time immemorial. Short stories about exceptional handicraft products all around the world.

MURANO GLASS (ITALY)

There is a simple reason why the island of Murano became the epitome of glassmaking: fear. In the 13th century there was a great fear that the furnaces of the glass-blowing workshops in Venice would cause a fire that would destroy the entire city – hence the move to Murano. The master craftsman works like a chemist, whose secret formulas give rise to a unique material. Quartz sand, lime, soda, potash, feldspar and clay are needed.

PRAYER BEADS (TURKEY)

Turkey has a long-standing tradition of manufacturing prayer beads. The classic prayer beads are made up of 99 individual beads. Every 33 beads are separated by a stopper or flag. The string comes together at the imam, which marks the start and end point. Depending on the quality, production time varies from one day to one month. The beads are made from plastic, wood, gemstones or other materials.



JEANS (USA)

Modern jeans originated from cotton trousers, which came to the USA from the area around the Italian city of Genoa. The pronunciation of "jeans" in America was heavily influenced by the French name for the city – "Gênes". Today there are many big manufacturers – and a few factories, for example, since 2010 in Detroit. It takes roughly four hours and 90 production steps are required, in order to make a pair of jeans by hand.

KNIVES (SOUTH AFRICA)

The art of forging is thousands of years old and very modern. All around the world, forges make knives from Damascus or stainless steel with handles made from wood, titanium or gold – including in South Africa. The award-winning custom knife maker Des Horn puts 30 years of experience into every one of his handmade knives. At the heart of this work are high-precision folding mechanisms and the compilation of the right materials for the handles, as well as the correct heat treatment of selected steels for the blades.

LACQUERWARE (MYANMAR)

Perhaps the best-known artistic goods from Myanmar are pieces of lacquerware, such as tables, trays or caskets. The lacquer is mixed with ash and applied by hand. Then the objects are left to dry for about a week before being polished. The final step is the decoration, which is engraved freehand, without using a template. As the lacquer does not leave much room for error, the pattern must be right on the first attempt.

Current highlights
of the Kärcher range

NEW ADDITIONS

Whether it’s need-based cleaning instead of a fixed cleaning schedule or battery-powered devices for independent and flexible work: Kärcher reacts promptly to the needs of its customers and develops innovative cleaning solutions for private users and professionals.

Professional

BD 80/100 W CLASSIC Bp

New push scrubber drier
in the Classic range

Home & Garden

LBL 2 BATTERY SET

Powerful leaf blower
with maximum mobility

Home & Garden

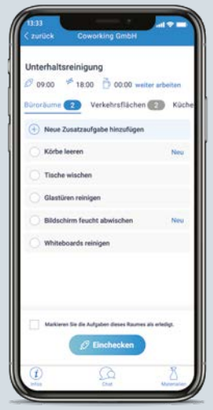
PCL 4

Electric
terrace cleaner

Professional

“ONE” APP SUITE AND PLATFORM

Digital transformation
of building services



Home & Garden

CONTROLLED REMOVAL OF LEAVES AND DIRT: LBL 2 BATTERY SET

- Cleaning the area around the house is made much easier without a power cable getting in the way.
- The 18-volt lithium-ion battery can be used in other platform devices.
- The ergonomic handle makes the work effortless.
- The flat nozzle ensures that leaves and loose dirt can be removed in a controlled manner.
- The scraping edge on the nozzle loosens wet leaves and compacted dirt.

kaercher.com/home-garden

Professional

EASY-TO-USE AND ROBUST: BD 80/100 W CLASSIC Bp

- Brush head and squeegee are made from hard-wearing aluminium and are therefore highly durable.
- For stubborn dirt or for decoating, the contact pressure can be increased from 40 to 68 kilograms.
- To ensure easy orientation on the machine, all the operating elements are colour-coded.
- The high-capacity battery allows continuous cleaning of up to five hours without recharging.
- The machine can be optionally equipped with the fleet management system Kärcher Fleet.
- The machine offers an economical introduction to the world of floor cleaning.

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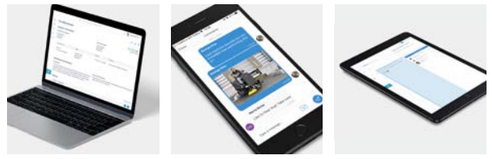
Professional

EFFICIENT AND DYNAMIC COOPERATION: “ONE”



- Building service contractors can record and support business processes digitally with the apps and the “ONE” platform.
- Order creation, material management, service provision, invoicing: “ONE” brings all information and participants together.
- The apps are intuitive to operate and accompany the organisation and provision of analogue services in real time.
- Intelligent resource and operational planning that takes real time data into account.
- “ONE” is compatible with Kärcher software and machines, as well as products from other providers.

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Home & Garden

REMOVES DIRT THANKS TO ROTATING ROLLER BRUSHES: PCL 4

- Specialist for wooden decks
- Dirt such as green algae, moss or leaves can be removed uniformly and efficiently.
- With the adjustable water output, dirt can be loosened and removed in one step.
- The powerful motor that drives the roller brushes ensures simple work with minimum effort.
- The brushes can be exchanged without using tools so that the PCL 4 can be used again in no time to clean smooth stone tiles.

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Home & Garden

WRE 4 BATTERY

Battery-powered
weed remover

Professional

MC 250

Municipal
vacuum sweeper

Professional

NT 22/1 Ap Bp L

First battery-powered
wet and dry vacuum cleaner from Kärcher

Home & Garden

WATERING SYSTEM DUO SMART KIT

Smart garden irrigation
with voice control

Professional

COMFORTABLE CITY CLEANING: MC 250



- The spacious two-person cabin is very comfortable.
- The tried-and-tested machine control system is operated via the ergonomic operating panel in the armrest.
- The volume of the waste container is 2.2 m^3 – the highest in its class.
- With a maximum speed of 60 km/h, the machine easily moves through city traffic.
- The machine's sprung chassis ensures pleasant working conditions.
- All components relevant for cleaning and maintenance are readily accessible.

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Home & Garden

REMOVE WEEDS EFFORTLESSLY AND EFFICIENTLY: WRE 4 BATTERY



- The 18-volt lithium-ion battery guarantees maximum mobility and can be used in other 18-volt lithium-ion platform devices.
- A high-speed brush head ensures fast and efficient work.
- When the bristle strip is worn, it can be easily replaced, without using tools.
- The aluminium telescopic handle can be adapted to different cleaning situations and body heights.
- A splash guard protects users and the surrounding area from dirt.

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Home & Garden

NEED-BASED IRRIGATION: WATERING SYSTEM DUO SMART KIT



- The watering system can be easily operated at any time and from anywhere using the app and voice control.
- Water and time are saved thanks to intelligent watering based on real-time weather data.
- The Kärcher Home & Garden app allows personalised settings for every water outlet.
- The voice control of the Kärcher Home & Garden app via Alexa Skill is simple and intuitive.

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Professional

CORDLESS ALTERNATIVE FOR WET AND DRY APPLICATIONS: NT 22/1 Ap Bp L



- The cordless vacuum cleaner really comes into its own in areas where there are no or only limited sockets.
- Cables are no longer a tripping hazard.
- Thanks to the maintenance-free lithium-ion battery (36 volts), up to 35 minutes of vacuuming can be done at full power.
- The user sees the remaining time on an LCD display on the battery.
- The use of battery-operated vacuum cleaners saves up to 20 per cent of the labour time needed when using corded models.
- The NT 22/1 Ap Bp L is part of the new battery platform Kärcher Battery Universe.

kaercher.com/professional

CAMERA ROLLING!

They live in Spain, Scotland, Germany, Switzerland or Thailand – people who overcome their daily challenges with Kärcher. For the new corporate film, the production team went on a little trip around the world and visited, among others, the tuk-tuk driver Boy Arthinkong in Bangkok.

Tuk-tuks are the sanctuary of every driver, equipped with colourful light effects and melodious music systems. It is not for nothing that the nimble motorised rickshaws are considered one of the attractions for tourists when they want to be driven through, for example, the bustling city of Bangkok. In order to capture the footage for the corporate film, the production team had to pursue the driver in a second tuk-tuk. At up to 60 km/h they manoeuvred between snack bars, stalls and restaurants, alongside countless other scooters, pedestrians and cars. The photo shows the team filming the cleaning of the tuk-tuk. Because before every shift, the driver carefully polishes his vehicle to a gleaming finish – in order to enter the fray again, playing loud music and in high spirits. ■

LET IDEAS TAKE FLIGHT WITHOUT LOSING TOUCH WITH REALITY

Innovation in corporate groups and start-ups

One company has existed for several decades, has thousands of employees and is active all around the globe. Another company is brand new, so to speak, is made up of five committed people and a great idea. It is well known that these two worlds can work very productively together and innovate. That it is also about bridging major differences is also common knowledge.

Since 2016 Kärcher has been looking for exciting start-ups and has already found some interesting technologies and business models. The example of SightCall shows what exactly can be achieved. The service tool was selected, is currently being tested in several foreign subsidiaries and is at the end of its pilot phase. **difference** finds out from SightCall and Kärcher how it all went and how things are going now. Also interviewed: Sobhan Khani, Vice President of Mobility and Internet of Things at Plug and Play (Sunnyvale, USA), an innovation platform which brings together corporate groups and start-ups.

Hans Göttlinger,
Vice President for the DACH region at SightCall

“GETTING STARTED AFTER SEVEN YEARS’ WORKING IN A GARAGE.”

Interview with Hans Göttlinger, Vice President for the DACH region at SightCall

Mr Göttlinger, how did the idea of SightCall come about?

The idea was actually born around ten years ago. Our founders are from the telecommunications sector and recognised the classic service-hotline problem: a customer describes his grievance, and the service technician on the telephone cannot understand which solution fits. And so the concept of giving the service technician eyes on the ground by means of video transmission was developed. The whole thing has only been on the market for around three years, though, because authentication, data security and the universal applicability for industrial customers were challenges that had to be overcome. Today SightCall is entirely cloud-based, i.e. installed in five minutes and easy to use. And we’re finally taking off now, after seven years of working in a garage.

What are the benefits of the collaboration with Kärcher for your company?

Kärcher is a very successful company and thus a good reference for us. Apart from that, we receive feedback from the service team as well as the customers, which is extremely valuable. What we have also been able to ascertain: it is not always about classic problem solving and service work. Even if users are not satisfied with a product due to handling errors, this can be quickly identified and rectified via SightCall. This is a wonderful side benefit of our solution.

What are your plans for the future?

We developed our open platform ourselves, so we are very flexible. This allows us to quickly implement current trends such as augmented reality – for example, the integration of operating instructions into the live picture. This is the direction that things will take in the future. ▪

“DESCRIBING THE PROBLEM WITHOUT A VISUAL AID IS TIME-CONSUMING.”

Interview with Maximilian Grau, Project Manager, Aftermarket & Services Kärcher

Mr Grau, what gave you the idea of testing SightCall?

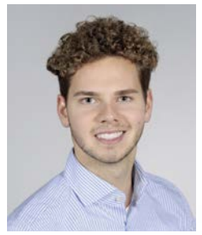
We already have various options for processing service issues, and since 2014 we have also had a service app for professional users. What is clear, however, is that describing problems with a machine without the use of a visual aid is time-consuming and can result in misunderstandings. This leads to long waiting times for our customers, which we want to avoid. The live video chat by SightCall works very simply and reliably – we examined various candidates in this area, but this solution really convinced us.

How is the initiative going down with the service staff?

In the test phase some foreign subsidiaries had the opportunity to test SightCall. These included, for example, teams in France, Austria, Switzerland, the USA and also Brazil. Our colleagues are very satisfied with the technology. The amount of time it saves is significant, which allows the service teams to work more efficiently. Depending on the quality of the network connection, the quality of the connection varies, depending on the site – that’s just the way it is.

And have you already received feedback from customers?

We have received extremely positive feedback because the fast troubleshooting procedure is well received. What is sometimes criticised: the customer has to install an app in order to use the video chat. That is why we are now in talking to SightCall about a web-based solution. At the end of the test phase in October 2019 we will decide where we go from there. I am very confident that we will include SightCall in our service portfolio. ■



Maximilian Grau,
Project Manager,
Aftermarket & Services
Kärcher

More information about this topic:
www.kaercher.com/difference

“CORPORATE GROUPS CAN BE AGILE IF THEY REALLY WANT TO BE.”

Interview with Sobhan Khani, Vice President of Mobility and Internet of Things at Plug and Play

Mr Khani, what is the objective of Plug and Play, and what are you responsible for specifically?

Plug and Play was founded in 2006 and aims to bring together innovative start-ups and large corporate groups. To this end, we have defined 14 areas of innovation across all industries, such as digital health, cyber security and also the area I am responsible for: Mobility & Internet of Things. In each area we work with a special selection programme, which has one clear benefit for each side: start-ups look for partners and, for corporate groups, we make a preselection of start-ups that match their technological needs.

How does it work exactly?

The corporate groups define a technological problem for which they are seeking a solution. We look all over the world for suitable young companies that offer solutions to this problem. We filter out the top 100 candidates and assess them with regard to team, technology, appeal and other criteria. In the end we have 30 start-ups, whom we invite to our “Selection Day”. They can each meet the judges, sent to us by the corporate group, for five minutes. Getting through the final selection process constitutes a major step forward for the young companies, because generally a collaboration follows as a result. And the corporate groups see what is happening in the industry, what trends there are and how this knowledge can be used in their own product development.

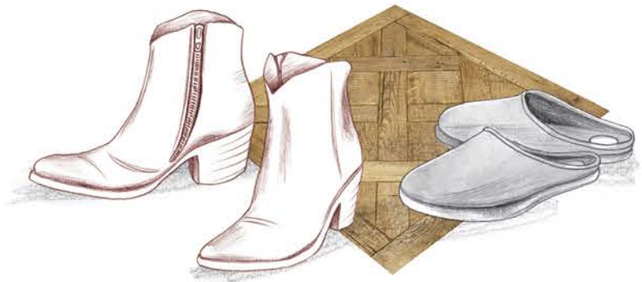
What challenges do you see when two very different worlds collide – the large corporation and the young company?

This is definitely very exciting because in one company the structure is young, fast and agile, and in the other company it is experienced and big. One obstacle for the collaboration lies in the entirely different processes. Here is a simple example from our everyday life: one of our start-ups showed us a 40-page confidentiality agreement, which it was meant to sign. However, it didn’t have the means or the lawyers to have such a mammoth document legally verified. We passed on this information and in the end a two-page version was issued, which was practical for both sides. The fact that this was possible shows that corporate groups can be agile if they really want to be. And, in my opinion, they need to be agile in order to survive in the future. ■

Sobhan Khani, Vice President of Mobility and Internet of Things at Plug and Play

WHAT AM I ACTUALLY STANDING ON?

Interesting facts about the floors on which we live.



We trample all over them, day after day, and yet the floors in our homes are integral to our comfort and wellbeing. Wood is warm, natural stone is stylish, carpet is cosy – the list goes on and on. But how did the different variants actually come about, and why is a certain type of floor covering hip one minute and a no-go the next? In the future, could the floor on which we walk perhaps even generate electricity or look out for the elderly? And – not to be forgotten – can a floor be destroyed by cleaning? Questions relating to a topic that we generally look down on.

From bare ground to fine stone:

FLOOR COVERINGS THROUGH THE AGES

For a long time people lived on the bare ground. But in order to avoid dust and sand, from early on people began to look for a more pleasant alternative. A short journey through time, which at some points resembles a trip around the world and is from time to time closely connected to the development of cleaning technology.

ANCIENT AND ROBUST: STONE FLOORS

If you are looking for one of the first examples of a man-made floor, you will end up in the southeast of Turkey, near the city of Urfa. There, in 1994, German archaeologists found a terrazzo-like screed made from smoothly polished limestone at the Göbekli Tepe archaeological site – built around 7,000 to 8,000 years before Christ in the oldest temple in the world that has been discovered to date.

Another astonishing anecdote about stone floors comes from Roman times – because in 80 BC the Roman merchant Gaius Sergius Orata installed stone floors with underfloor heating. He adopted an idea that had first been successfully implemented by the Cretans, which involved chanelling warm air into cavities under the floor and in the walls. This construction technique was later used in Roman baths and in the large imperial thermal baths.

To this day stone floors are hugely popular, to such an extent that you can hardly keep track of all the varieties. The options range from natural stone floors such as marble or granite to various artificial stone finishes through to fine stone, which are actually by-products. The dust particles that are produced when cutting natural stone are ground up and stuck together – which results in a beautiful appearance and, at the same time, in a sustainable product, for which as much as possible is extracted from the raw materials used.

SOMETIMES CLASSY, SOMETIMES SHABBY: CARPET

For the first carpet the journey does not go back quite so far. The Pazyryk rug is considered the oldest surviving example of a pile carpet in the world. It was created in around the 4th or 5th century BC and was discovered in 1947 by a team of Russian archaeologists in the Altai mountains near the border to Outer Mongolia.

There is also a myth about the oldest red carpet for the stars. It supposed to have been used in the Dionysos Theatre at the foot of the Acropolis for the première of a play by the Greek poet Aischylos in around 548 BC.

If you jump from these early examples to modern times, then the history of the carpet is closely linked to the development of cleaning technology. In the 19th and 20th centuries it was possible to improve the acoustics in rooms and make them cosier by putting down loose rugs. However, the cleaning of the rugs was not very popular. As well as carpet beaters, there were actually also carpet-beating machines, which drove through the streets and offered their services. Fixed carpets emerged in the USA in the 1930s, but not until the 1950s in Europe. In the 1960s the first vacuum cleaners for domestic use were finally available on the market and made cleaning much easier.

Today, with proper cleaning, carpets are even considered suitable those with allergies, and the variety of materials used ranges from seaweed to natural and artificial fibres through to PET bottles and denim strips. Especially in areas which are sensitive to sound – in the hotel business, in conference rooms, etc. – carpets are very popular as they soften the cool, reverberating glass and concrete architecture that is so common today.

WARM AND SUSTAINABLE: WOODEN FLOORS

Surprisingly, timber was a late bloomer as a floor covering. In the 11th century after Christ the first wooden planks with sawn or chopped surfaces were used as floors in castles and mansions. The first parquet floor in the world became well and truly famous: in 1684 the French “Sun King” Ludwig XIV had parquet flooring laid in his hall of mirrors at the Palace of Versailles. This well-known parquet floor is called the parquet de Versailles.

Today solid wood floors have competition from more affordable laminates, but with the proper care and maintenance wood is an impressively sustainable material. Whereas wooden floorboards were previously lacquered in order to protect them from external impacts, today the floors are oiled, waxed or soaped. With the proper surface treatment the material is robust and can be sanded several times so that new floors do not have to be laid too soon.

When cleaning one should simply reduce moisture and avoid standing water. The positive effect that this has around the home ranges from its beautiful appearance through to an improved indoor climate as wooden floors are never cold and regulate humidity. ■

Smart floor, caring floor:

WHAT WILL BE POSSIBLE IN THE FUTURE

Generate electricity with every step, improve age-appropriate living, ensure hygiene – floor coverings should soon do more than simply be under foot. Some highlights of current research.

TWO TO FOUR JOULES PER STEP: LET THERE BE LIGHT!

The idea that floor coverings could generate electricity from the steps of the people who walk on them has been researched for a while now. One person generates between two and four joules of energy per step, at two steps per second this would equate to one to two watts of power. If this energy was delivered to efficient LED lighting in long hallways, then the public's footsteps could provide light. No competition for big power plants, but still a way of producing sustainable electricity.

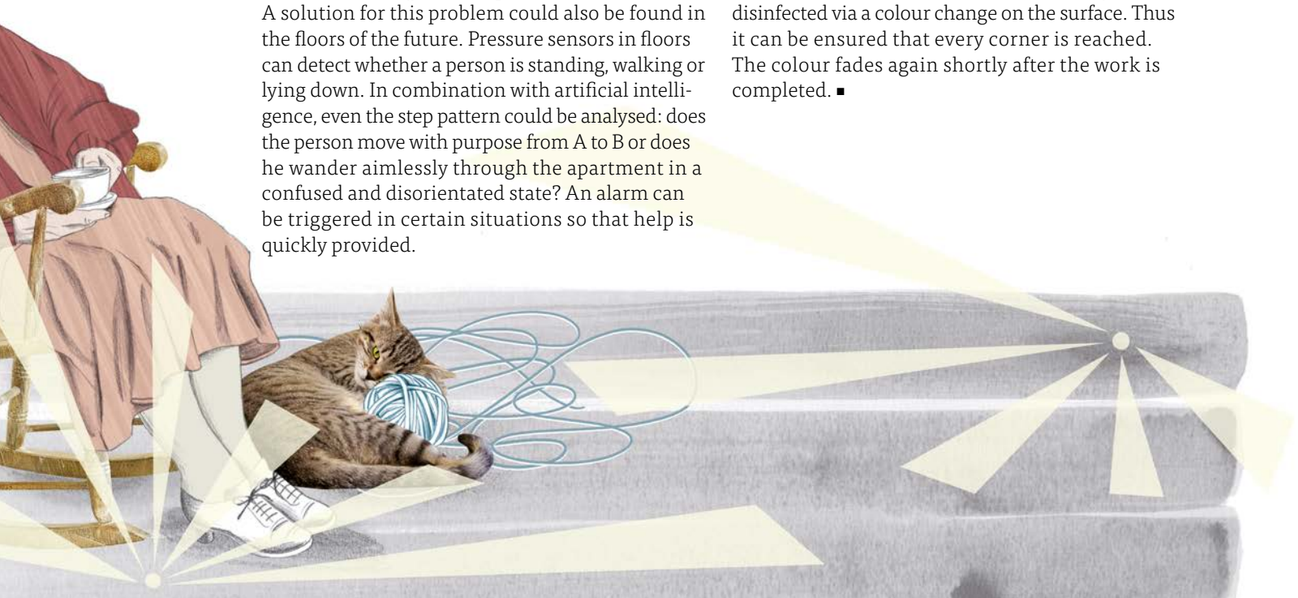
KNOW WHETHER EVERYTHING IS IN ORDER: WHEN FLOORS ARE SENSITIVE.

More and more older people live alone, and the matter of how their health can be reliably monitored will continue to gain in importance in the future. A solution for this problem could also be found in the floors of the future. Pressure sensors in floors can detect whether a person is standing, walking or lying down. In combination with artificial intelligence, even the step pattern could be analysed: does the person move with purpose from A to B or does he wander aimlessly through the apartment in a confused and disorientated state? An alarm can be triggered in certain situations so that help is quickly provided.

KILL GERMS, INDICATE DISINFECTION: HEALTH!

Floor coverings are also becoming increasingly important in terms of hygiene. Amongst other things, research is being conducted into what substances floors can emit in order to kill germs. For example, silver ions are already being used successfully in textiles which are worn on the skin. However, it is not possible to transfer this one-to-one to floors.Yet certain types of wood naturally have a germ-killing effect, as do the the linseed oil-based binders in linoleum. One of the objectives of the research is to recreate the effects of these natural raw materials.

For hospitals, two functional variants that aim to ensure hygiene are gaining ground. Firstly, floors are available which emit biocides to kill germs. Secondly, there are floors which, when wiped with disinfectant, show which areas have already been disinfected via a colour change on the surface. Thus it can be ensured that every corner is reached. The colour fades again shortly after the work is completed. ■



"YOU CAN'T TIDY DIRT."

Daniel Carmine Manocchio, Head of the Materials Laboratory at Kärcher, on floor cleaning

What is the most important rule for floor cleaning?

Cleaning generally involves removing dirt. Dirt is what lies around and cannot be tidied. We want to destroy this dirt in some way, only sometimes we forget to pay attention what's below it. This means we should work in a non-destructive manner without breaking down materials, breaking fibres or dissolving paint. Otherwise, cleaning and damaging are closely intertwined.

What should one generally pay attention to?

If we take a look at parquet flooring, for example, then I should know what type of parquet floor I have. If it is sealed, then I can very gently use a steam cleaner and enjoy the flooring for a long time. If it is oiled or waxed, the use of steam is discouraged. Here vacuum cleaning or dust-binding wiping is called for; I do not always have to wipe the entire area with a moist cloth afterwards, since I can selectively remove clogged dirt with wet wiping. This example shows that the right cleaning technology achieves the desired objective with minimum effort and often minimises the work.

Do you have a nice anecdote from your many years of work about what improper cleaning can result in?

Sure, I've got plenty of stories. For example, one time we had a man who complained about our hard floor cleaner – he said it had destroyed his parquet. It is important to know that this machine works with two microfibre rollers and makes the floor slightly damp as it cleans; it is designed precisely for cleaning parquet floors. The problem: over the years the man had cleaned his parquet with a wet cloth so that the floor boards had swelled at the ends. In this case the mechanics of our machine naturally finished the floor off. If you work with the appropriate machines from the outset, such experiences are avoided. The customer then understood this. ■

PLASTICS MAKE A COMEBACK

Can plastic save the world? Yes, if it is recycled and thus gets a second life. An array of initiatives and procedures worldwide are transforming old plastics into new raw materials. This way, they help to solve the global waste problem.

The properties of the recycalte are checked in the materials laboratory at Kärcher.

Plastics have not only one life, but two, three or even more. Once sorted and thrown away, they return to the production process as so-called recyclates – recycled raw materials. Their comebacks can look very different. Fleece jumpers are made from plastic bottles, computer screens from DVDs and mobile phone cases are made from polystyrene. Most recyclates are made into tubes or construction panels or, often, end up where they came from – as packaging material in supermarkets and drugstores.

The use of recyclates saves a great deal of energy, water and resources and lowers CO_2 emissions. Plastic recycling also helps to get a grip on the global plastic waste problem. Approximately 150 million tons of plastic are already in our oceans. According to studies conducted by the United Nations (UN), by 2050 there could be more pieces of plastic swimming in the oceans than fish. A team of American researchers recently went on an expedition to the Mariana Trench with a special submarine. In this oceanic trench in the Pacific Ocean, the deepest known point on earth, the scientists found – besides three as yet unknown animal species – a plastic bag.

New products through recycling

Companies and organisations worldwide have developed concepts and technologies which promise concrete solutions. The German environmental organisation One Earth – One Ocean e. V., for example, collects the plastic with special waste carriers, sorts it into groups of identical materials and processes it. The waste is turned back into recyclable plastics and sometimes into crude oil. One pioneer in plastic recycling is the chemical group Solvay, which is one of the ten largest chemical companies in the world. In 2016, Solvay launched a process called "Technyl® 4earth®" in which high-quality recyclates are obtained from technical textiles. Kärcher is one of the first companies to use this technology in series production for the consumer market. The original material for the spray lances of high-pressure cleaners is the fabric of discarded airbags, which is recycled into the robust plastic polyamide. It is reinforced with glass fibres because the spray lances must withstand exceptionally high pressure. They must also be resistant to environmental influences and cleaning agents.

A "green" comeback, which breathes new life into the old material. ■

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KÄRCHER is a leading global provider of cleaning technology. Kärcher offers innovative solutions, with high-pressure and ultra high-pressure cleaners, vacuum cleaners and steam cleaners, sweepers and scrubber driers, vehicle wash systems, cleaning agents, dry ice blasters, water and waste water treatment systems and water dispensers, as well as pump and watering systems for the home and garden. Solutions include compatible products and accessories, as well as consulting, service and numerous digital applications. In 2018, Alfred Kärcher SE & Co. KG achieved its highest turnover ever, with 2,525 billion euros. The family-run business employs over 13,000 staff in more than 120 companies across 70 countries. With 50,000 services centres worldwide, Kärcher offers customers across the globe a seamless and comprehensive service. Innovation is the most important growth factor for the company and has been an integral part of the corporate culture since the company's foundation in 1935: around 90 percent of all products are five years old or less. In total, more than 1,000 staff at the cleaning machine manufacturer work in research and development. Kärcher currently holds over 630 active patents.

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