

difference

THE KÄRCHER MAGAZINE

01 | 2018

TIME

Old landscapes and modern life

GIANTS OF THE ROAD

The tough job of a road train trucker in Australia

WHAT ACTUALLY IS DIRT?

Sand on the desk and diamonds in the waste bin

ON HAPPINESS

Insights into a good life





› 01 | 2018

Dear readers,

This issue of our customer magazine **difference** shows just how multifaceted the topic of cleaning is. This time, our reports take us to the mining region of Western Australia, where a truck wash system has a tough job: over 300 kilograms of dirt can stick to the over 50-metre-long road trains. Together with experts in waste policy and ethnological urban research, we also take a look at what counts as dirt from various different perspectives - with some interesting results. And in our interview with psychologist Dr Nico Rose, we find out about happiness in general, and how a pressure washer can be part of it. I hope you enjoy reading!

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



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IN SECONDS, FOR MILLENNIA

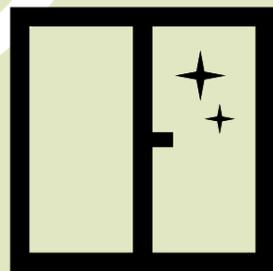
Time plays all sorts of different roles when it comes to cleaning.

2 minutes



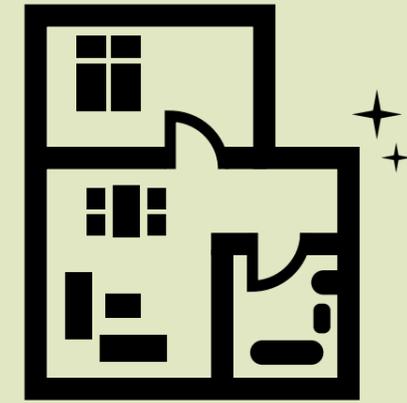
A cleaning crew has just 45 minutes to clean a jumbo jet after an intercontinental flight, and just 10 after regional flights. The major airlines will only tolerate a delay of 2 minutes per 100 cleaning operations - air traffic is always on a very tight schedule.

9.14 seconds



The world record for window cleaning is 9.14 seconds. That's how long the UK's Terry Burrows took to clean a window measuring 45 x 45 centimetres at the annual world championships in 2009.

16 months



We spend 16 months of our lives cleaning our homes.



4:05 hours

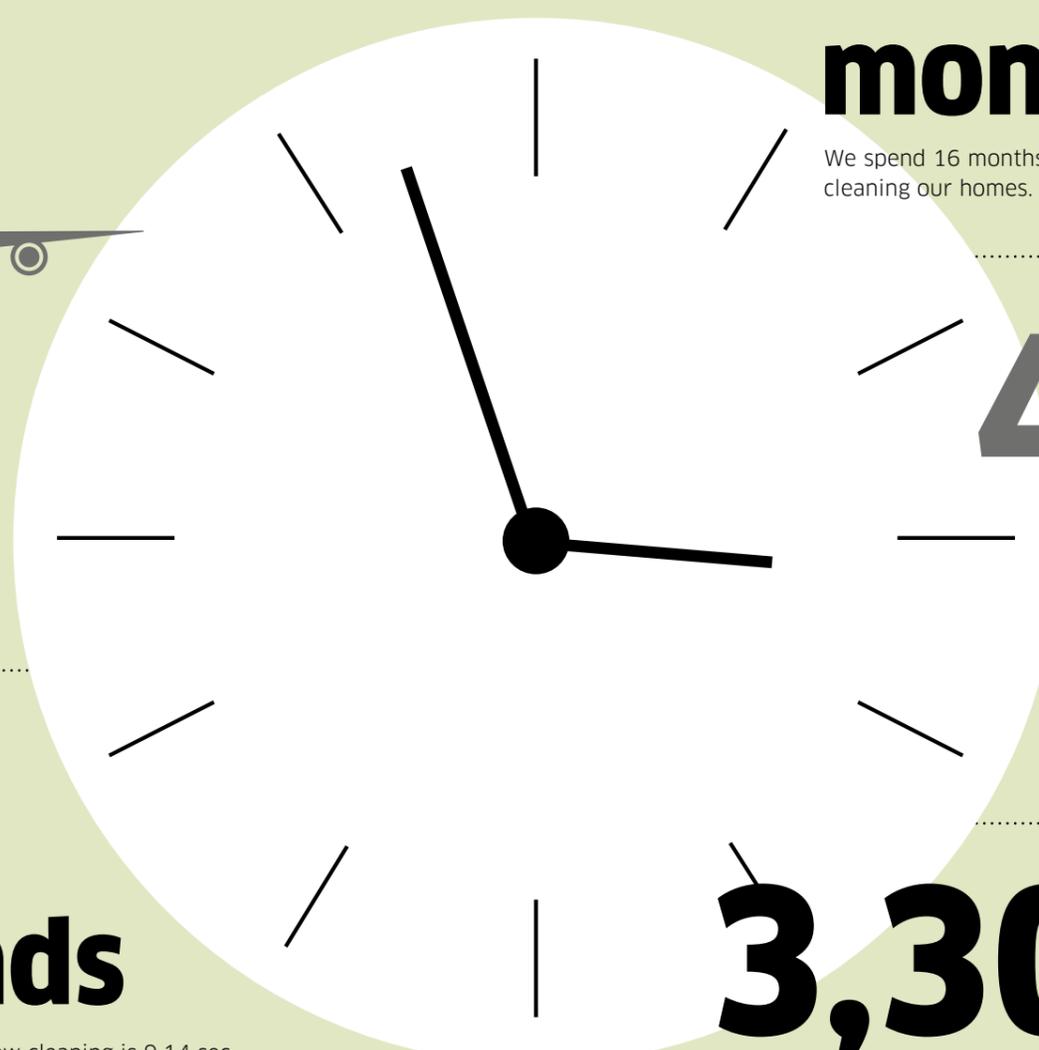


According to a recent international survey, people in Brazil spend the longest time cleaning, at 4:05 hours per week. Just under 10 per cent of those surveyed said they spend over 10 hours cleaning.

3,300 years



In 2002, Kärcher experts cleaned the Colossi of Memnon in Egypt using the particle blasting method. The 3,300-year-old statues are among the largest and most important monuments in the Valley of the Kings.



1195

1395

1595

1795

1995

2025

Endless expanses, enormous trucks

ROAD TRAINS - THE LONGEST TRUCKS IN THE WORLD

They are as much a part of Australia as kangaroos and the Great Barrier Reef: road trains supply remote areas with goods of all kinds. At over 50 metres long and weighing 130 tonnes, they are the kings of the road. But these giants spend their days exposed to extreme temperatures and aggressive dirt. A normal wash system simply wouldn't be able to cope.



» Without our trips, it would be impossible to live and work in these remote areas. «

Rob Harrison, Linfox



Rob has a passion for trucking. Early-morning exercise on his paddle board provides a balance.

There is some dispute about where the name of the Pilbara region in Western Australia comes from. Some people believe it comes from the Aboriginal word "bilybara", which means "dry". Others say that it is derived from the name of a local species of fish. Wherever its name comes from, the region features spectacularly beautiful nature and some of the oldest natural landscapes in the world. Endless deserts, rocky gorges and remote settlements. But there is another side to the region as well. It is at the heart of the Australian mining industry, which requires the transportation of large quantities of crude oil, salt, natural gas and iron ore.

Kings of the road
To connect the region to the rest of this expansive country, the drivers of road

trains have to cover vast distances. Road trains are huge trucks which are used in Australia to transport goods overland

132
TONNES
IS THE MAXIMUM WEIGHT FOR
AN AUSTRALIAN ROAD TRAIN WITHOUT
A TOWING VEHICLE.

to remote regions. Nowhere in the world has more road trains or longer road trains than Australia. Hundreds of these vehicles are operated by the logistics company Linfox. Not only do they

transport the mined natural resources, they also supply the region with vital goods such as food products or fuel.

Rob Harrison is a road train driver. He has done the job for 20 years and knows the area like the back of his hand. From the red sand of the expansive desert landscape to the crystal-clear water of the ocean – he has seen everything the region has to offer. And he has a passion for trucking. Rob's day starts early. "I get up at 4:30 and do some exercise." If you sit at the wheel for hours at a time concentrating hard, you need something to balance it out. "I like going swimming with friends" – but his favourite activity is stand-up paddle boarding. "I paddle through the water like a maniac on the board." After training it's time for work, at the wheel of a road train worth over a million dollars.

An important delivery

Today, he's heading to Marble Bar, around 200 km inland. The diesel in Rob's tanks is the elixir of life for the mine there. "Without our supply trips, the generators would give up the ghost, the canteens would have no food, the machines wouldn't be able to run."

Marble Bar is one of the hottest places in the world, with temperatures regularly exceeding 40 degrees. It is an inhospitable environment and a real challenge for people and machines. "If the temperatures reach 35 degrees, we get sandstorms. They look fantastic from a distance, but if you have to drive through one you'll notice straight away that the sand settles on everything," explains Rob. And the ever-present iron ore dust around the mines compounds the situation.



5 PILBARA FACTS

- The Pilbara is one of the nine regions that make up the state of Western Australia.
- 67,000 people live in an area measuring over 500,000 square kilometres.
- The climate is characterised by high temperatures, low rainfall and low humidity.
- The Pilbara has the world's largest iron ore deposits.
- Alongside the mining and oil industries, tourism is also important to the region.



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The road train wash system has been specially developed with a unique design. It cleans the huge trucks in a four-stage process.



» The two companies worked in close collaboration to create a unique, state-of-the-art wash system. «



.....
Once he has arrived at the destination, Rob checks the tanks. If everything is in perfect condition, the diesel is drained into huge storage tanks.

WATER RECLAMATION

The water reclamation system has also been specially designed. The reclaimed water is collected in underground tanks and is then processed using natural methods. The 30-metre-long tank alongside the wash system looks like a huge swimming pool. The water it contains is cleaned in various stages. In this way, eighty per cent of the water can be reused.

After travelling hundreds of kilometres on dirty and, in some cases, unsurfaced roads, everything is covered in dust. "It's not enough to make sure that the product arrives where it is needed. I also have to make sure that the product is delivered safely in perfect condition without any contamination." To ensure this is the case, Rob checks the tanks and cleans the connection points on the truck before the freight is unloaded. Then it's time to get back on the road, through the expansive Pilbara landscape.

It is a region of extremes: in the rainy season, the rain is as intense as the hot, dry conditions are for the rest of the year. Between November and May in particular, sudden and heavy rainfall quickly turns the dusty roads into muddy tracks. This also presents a

challenge for the heavy road trains. "You soon find that you've got 300 kilograms of mud stuck to the undercarriage of the truck," says Rob.

Cleanliness and safety go hand in hand

Whether it is dust and sand or wet mud, both compromise the reliability of the transporters. High safety standards and clean trucks are of paramount importance for Linfox. As a normal truck wash system is not suitable for the over 50-metre-long road trains, Linfox commissioned Kärcher to develop a cleaning system specifically tailored to the oversized vehicles.

The two companies worked in close collaboration to create a unique, state-of-the-art wash system. Thanks to the four-stage cleaning process, the giant

vehicles only have to pass through the system once to get clean. The first stage cools the road train down with cold water. This protects the surfaces in the subsequent stages. Next, the truck drives over a special system which

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MINUTES
IS HOW LONG IT TAKES TO CLEAN
THE GIANT TRUCK.

cleans the undercarriage. At the same time, the wheels and sides of the vehicle are cleaned by multiple rotating

high-pressure nozzles. In the third stage, a stationary pressure washer with four points of use on two levels is available if particularly stubborn dirt needs to be removed manually. In the fourth and final stage, the truck drives through an arch with high-pressure nozzles. This rinses off any remaining dirt. When it emerges, the giant vehicle looks as good as new.

"The wash system makes life easier for us. In our industry, time is always an important factor," says Rob. "Being able to clean my 50-metre-long truck in 15 minutes is amazing." Before the new cleaning system was developed, the vehicles were cleaned with a pressure washer and lots of elbow grease. It took five hours to clean a single truck – valuable time that could be put to better use elsewhere. "Now I can simply drive

through without having to do anything. I drive straight ahead and the wash system does everything else."

After the cleaning stop, it's time to hit the road once again and head back into the Pilbara's vast expanses. "Despite the harsh conditions and brutal heat, this is a magical place for me." Rob soon forgets about the isolation, loneliness, hard work and long days when he sees this unique landscape. "You just have to take the time to look around."

Video showing a day on the road with Rob:
www.kaercher.com/difference



A mosaic of dirt

SAND ON THE DESK AND DIAMONDS IN THE WASTE BIN

When you look at which cleaning devices are used in different situations, the key question is always what is regarded as dirt - and thus needs to be removed - in the case in question. It is therefore worth looking at the offending substance in more detail. **difference** has been doing some prospecting on the subject of dirt and has discovered some real treasures along the way.

2018

1970

1200

Mosaic tile 1

HOW CLEANLINESS CAME AND WENT

➤ For a long time, dirt was simply any kind of perishable material that was an inevitable consequence of people living together in one place. Even in antiquity, advanced civilisations were extremely preoccupied with this subject and developed sophisticated municipal systems to keep their cities clean, culminating in the sewer system of ancient Rome. All of this knowledge was lost in medieval Europe, which represents a real nadir in the history of cleanliness.

It was not until the era of industrialisation that society's attitudes towards the issue changed. This period saw huge technological progress and new employment opportunities, but it also led to new kinds of pollution. Large numbers of workers living in close proximity in the cities, combined with poor hygiene standards, led to an outbreak of epidemics. As a result, the role of dirt in the proliferation of disease started to come under closer scrutiny. Initially, the poor and the sick were stigmatised, but eventually society began to face up to the challenge of tackling the structural causes. Municipal cleaning, last seen in ancient times, arrived in the modern age and became a social duty.



Mosaic tile 2

WHY DIRT IS IN THE EYE OF THE BEHOLDER

➤ In the 1970s, the anthropologist and cultural theorist Mary Douglas discussed possible definitions of the concept of dirt in her work "Purity and Danger". She deduced that, in general, dirt is anything that is in the wrong place. Most people would probably agree that sand on a desk is out of place, whereas sand on a beach is beautiful. This example shows that the perception of dirt has a lot to do with our own sense of order. It stands to reason that this varies from country to country, meaning that there are major cultural differences in the perception of dirt.

The scientific understanding of dirt has continued to develop over the decades, as the categorisation of dirt as something in the wrong place does not work in every case: you would be unlikely to say that a diamond in a waste bin was dirt, for example. It is therefore clear that factors such as aesthetics and material value also have to be taken into account.

Mosaic tile 3

DIRT AS AN OPPORTUNITY AND A CHALLENGE

➤ For a long time, people were keen to distance themselves from dirt and waste, but now they are considered valuable resources. The concept of sustainability – a major issue for the future – creates a closed-loop system encompassing dirt prevention, need-based cleaning and maximum recycling of waste, even when it comes to road sweepings. In 2015, a British company came up with an interesting approach and created a pilot system to filter road sweepings in order to recover rare metals such as palladium, rhodium or platinum. They believe they can recover five kilograms of these metals per 50,000 tonnes of waste – a worthwhile endeavour if the prices of these rare resources continue to rise.

Alongside modern recycling methods like this, waste recycling is also an important subject in emerging and developing countries: for a long time, waste pickers were frowned upon, but systems are now being established which employ these people as a regular workforce and recognise their value with regard to the recycling of previously non-recovered waste.

Despite all of these efforts, however, when we take a global view of things, the problem of pollution is on the rise – from plastic in the oceans to nitrate in the water. This pollution may not be as permanently visible as the actual dirt in front of your own front door, but a solution is urgently required. A key task for innovative technologies will therefore be to get dirt – some of which they produce themselves – back under control and, ideally, to make it recyclable.



Mosaic tile 4

CLEANING TECHNOLOGY – FOR WELL-BEING AND VALUE RETENTION

➤ Modern cleaning technology plays a key role when it comes to dealing with dirt. If you think about applications in the home, the requirements are clearly defined: depending on your particular cleanliness standards, you need to get rid of dirt with devices that are as ergonomic and efficient as possible, from the vacuum cleaner to the pressure washer. Good technology makes housework and gardening easier, thus contributing to a sense of well-being.

In industrial environments, on the other hand, the technology takes on many more functions: keeping machines in production facilities clean at all times, for example, is an important factor when it comes to value retention and maintenance. In medical environments, cleaning technology is essential to ensuring hygiene. It is becoming possible to eliminate more and more dirt and even to achieve clean room conditions. The cleanest clean room in the world, with an area of 250 square metres, is run by the Fraunhofer Institute for Manufacturing Engineering and Automation in Stuttgart. A cubic metre of air in this room contains just a single particle, measuring 0.1 micrometres – now that's what you call clean.

Our journey through the history of dirt was supported by Professor Eveline Dürr (Institute of Social and Cultural Anthropology, LMU Munich, Germany) and Professor Jutta Gutberlet (Department of Geography, University of Victoria, Canada).

1200 1970 2018

From ultra-high pressure to dry ice

THE FIGHT AGAINST DIRT

Across the spectrum of industries, different challenges come to the fore when it comes to cleaning. The methods and devices used vary accordingly. Here is an overview.

Chemical industry

Cleaning tasks are not part of the core business of the chemical industry, but they are necessary to ensure smooth and efficient processes. Proper cleaning of production facilities keeps the product quality consistent, which is a key factor for market success. Furthermore, it is necessary to ensure compliance with internal regulations and general standards. There is a wide range of options available, from cleaning-in-process systems (CIP) to mobile systems on-site. Alternatively, parts can be dismantled and cleaned at external wash stations. When it comes to finding the right cleaning technology, there are also different versions to choose from; in many cases, ultra-high-pressure technology is the most efficient method.

Metal processing

Milling, drilling, turning, sawing, grinding, deburring or brushing: the metal processing industry involves all kinds of processes which cause an accumulation of chips, very fine dust and – in some cases – liquids such as cooling lubricants. To ensure maximum product quality and work safety, it is important to select the right extraction solution. Solutions that are fully automated along the entire chip process chain are gaining ground at the moment. They cover the whole cycle, from the accumulation of the chips – i.e. the machining stage – right through to the recycler. The higher investment required for the technology pays off quickly with improved productivity and process reliability as well as reduced staffing costs.

» Alongside compliance with hygiene and occupational safety standards, key success factors in the food industry include efficiency and smooth integration into production processes.«

Construction machines

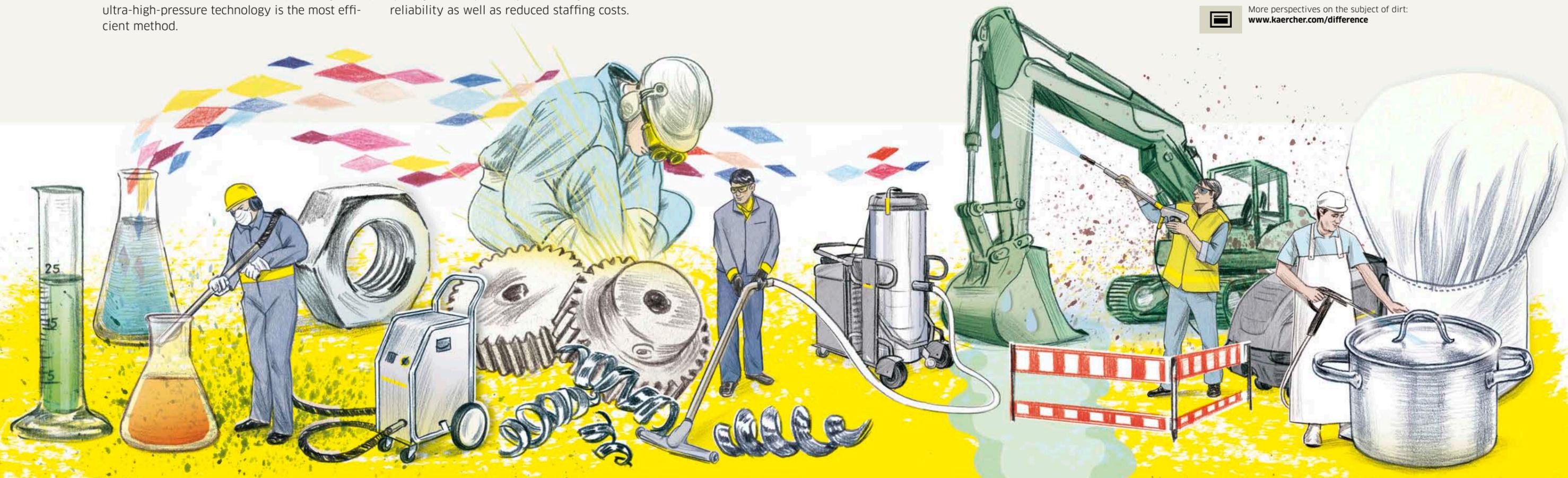
Cleaning construction machines enables them to retain their value in the long term and maintains an impressive appearance. It is part of every maintenance process, ensures smooth operation and significantly increases the lifetime of the machines. In this way, machine damage – plus the resulting disruption to work and the repair costs – can be avoided. High-pressure cleaning is a popular method due to its versatility: it can be used to clean the undercarriage, exterior and engine as well as the machine components.

Food industry

The production, storage and transport of food are governed by extremely strict guidelines and standards. For companies to comply with these specifications, they need reliable cleaning concepts among other things. Methods and technologies used in this industry include wet and dry vacuum cleaners, industrial vacuums, scrubber driers and sweepers, extraction systems, hot steam and ultra pressure technology, and dry ice cleaning. Alongside compliance with hygiene and occupational safety standards, key success factors include efficiency and smooth integration into production processes.



More perspectives on the subject of dirt:
www.kaercher.com/difference



Current highlights
from the Kärcher programme

THE NEW ONES

Whether it is detailed solutions which lead to amazing improvements or completely new products that revolutionise cleaning: with Kärcher technology, private users cope with daily routines effortlessly – professionals appreciate the efficiency provided by tailor-made solutions.

Professional

KM 85/50 R Bp

Compact ride-on sweeper
as entry-level model



Home & Garden

AD 4 PREMIUM

New ash vacuum cleaner with
long-lasting suction power



Home & Garden

SP 5 DUAL

Submersible flat suction
dirty water pump, for flexible use



Professional

WVP 10

Practical Window Vac
for commercial users



Home & Garden



LONG-LASTING SUCTION POWER DESPITE ASH DUST: AD 4 PREMIUM



- Integrated filter cleaning ensures long-lasting suction power.
- Certified for vacuuming ash.
- Quick and easy filter removal and emptying of waste container without coming into contact with the ash.
- Accompanying accessories are stowed on the device to save space and keep them close at hand at all times.
- Thanks to the suction tube, additional exhaust air filter and floor nozzle, this is a fully fledged dry vacuum cleaner in energy efficiency class A+ (scale A+++ to D).

Professional



CONVENIENT AND AGILE: KM 85/50 R Bp



- Very compact and easy to manoeuvre, suitable for tight spaces.
- The position of the seat and height of the steering column can be adjusted to ensure a healthy posture while working.
- High area performance.
- During operation, the rotation speed of the side brushes can be adapted to the volume and type of dirt.
- The floating main roller brush regulates the contact pressure automatically.

Home & Garden

VC 5 CORDLESS

Compact, high-power, battery-operated vacuum cleaner



Professional

AFG 100

Attractive air cleaner keeps room air clean



Professional



FOR CLEAN, GLEAMING, STREAK-FREE RESULTS: WVP 10



- A practical addition when cleaning windows, mirrors and other smooth surfaces manually.
- Dirty water remaining on the surfaces after cleaning is suctioned away - leaving the surface free of streaks and residues.
- Easy handling thanks to low weight of 750 grams.
- Can be used horizontally and vertically.
- Running time on one battery charge approx. 30 minutes, enough to clean a surface of around 110 square metres.

Home & Garden



TWO IN ONE: SP 5 DUAL



- Flat suction, also suitable for dirty water.
- You can choose between dirty water intake and flat suction by turning the filter basket.
- Long lifetime thanks to ceramic slide ring sealing.
- The vertically adjustable float switch automatically starts the pump at the selected water height.
- The quick connection system makes the hose very easy to handle.

Professional

HD 7/16-4 M

New cold water high-pressure cleaner, middle class



Home & Garden

KHB 5 BATTERY

Compact pressure cleaner for quick in-between cleaning





**BREATHE FREELY:
AFG 100**



- Cleans the air in enclosed spaces more effectively than a HEPA system can.
- The air flow is directed through a plasma field which destroys viruses, bacteria and allergens without leaving harmful residues.
- Suitable for rooms measuring up to 60 square metres.
- Can be adapted to different conditions thanks to five power levels, energy-efficient automatic mode and timer function.
- The slimline device blends discreetly into its surroundings.



**CORDLESS AND FLEXIBLE:
VC 5 CORDLESS**



- Height of just 62 cm in the parking position.
- Can be extended to the right length in one simple move.
- The lithium-ion battery provides energy for up to 60 minutes, depending on the model.
- Bagless system: easy to empty the filter without having to buy more filter bags.
- Efficient and durable brushless motor.



**BATTERY-POWERED AND READY TO USE
IN NO TIME: KHB 5 BATTERY**



- Ready in no time for work around the house.
- Independent of mains power thanks to 18 V battery.
- Very compact device design.
- The battery indicates the remaining running time.
- Even suitable for cleaning sensitive surfaces.



**HIGH POWER, HIGH FLEXIBILITY:
HD 7/16-4 M**



- Very robust and reliable thanks to automatic pressure relief system.
- A large water inlet filter protects the pump.
- Cylinder head made of brass.
- Efficient pump technology. 15 per cent better cleaning performance with the same energy use compared to its predecessor.
- Flexible set-up for different applications. Also available as stationary device and cage version.

FACTORS FOR SUCCESS

Whether you are trying to remove a stain from a carpet or decades-old dirt from a facade, time is one of the four factors which determine the quality of cleaning results – according to Sinner’s cleaning circle.

➤ Sinner’s cleaning circle states that four factors – application and processing time, mechanical energy, temperature and chemical action – govern whether or not the desired cleaning effect is achieved. The four factors must be coordinated with each other but can also compensate for one another. If, for example, you clean a surface with a pressure washer with cold water and no

cleaning agent, more mechanical energy is required. This energy comes from the impact pressure of the high-pressure jet, which largely depends on the design of the nozzle. The image shows automatic testing of the spray pattern of high-pressure nozzles. Coloured light makes the water jet more visible to cameras. ■

Time for happiness?

INSIGHTS INTO A GOOD LIFE

Family and friends, education, health and prosperity: in its study of 155 countries, the World Happiness Report indicates that discrepancies in these areas significantly influence our feelings of happiness. The PNAS* study "Buying time promotes happiness", meanwhile, draws attention to an additional factor that has previously remained hidden: time. Because only those who have time are able to spend it doing things that make them happy. Of course, it is up to each individual to decide whether to treat themselves to a babysitter, a cleaner or special equipment to make housework and gardening quick and easy.

➤ Together with Dr Nico Rose, expert on positive psychology, coach and staff of Bertelsmann's CHRO, **difference** is taking time in this issue for a journey into the secrets of happiness – and finding out what Kärcher could have to do with it.

Dr Rose, looking back at history, is it particularly difficult to be happy today?

I don't think it has got more difficult; quite the opposite, in fact. But the challenges and problems we encounter on the path to happiness have evolved due to changes in our living conditions. I would describe them as "better problems" compared to earlier times. To take a couple of examples:

In the past, if you were the first son of a cobbler, you would become a cobbler too, without any ifs or buts. You might have been happy with that, you might not. The question didn't come up. Today, in Germany alone you can choose from around 20,000 courses of study. Some people may find this freedom of choice a burden, but it is generally considered a good thing.

The same goes for later on in life. In the past, people didn't live long enough to worry about what they would do when they retired. Or there were no pensions, and people simply worked until they dropped. Looking at things from an objective perspective, I think we are better off today. But we also have to make more decisions under conditions of uncertainty. That can affect

our mood subjectively. Nevertheless, I doubt people would swap their lives with those from 200 years ago.

One person's joy is another person's sorrow: how much does the understanding of happiness vary in different regions of the world?

To take a somewhat simplified view, the understanding of happiness can be roughly divided into East and West. In this case, the Western perspective is characterised by individualistic cultures based on the prototype of the American Dream. The focus is primarily on personal happiness. On the other side, you have collectivist cultures with China as the prototype. In this case, personal happiness is linked much more strongly to other people or to the "system".

Generally speaking, Western European cultures fall halfway between these two philosophies. Scandinavia is an interesting case. For years, the Scandinavian countries have come out on top of the rankings of the world's happiest countries. People there enjoy a great deal of individual freedom, but at the same time a sophisticated welfare state system ensures that material differences between citizens are not too large and there is a strong sense of togetherness. This mix seems to be an ideal breeding ground for personal happiness.





What is the link between happiness and time?

There are many different ways to answer that question. I would single out three different perspectives.

When it comes to time in terms of our age, we can, in principle, look forward to getting older. There is evidence of a midlife crisis happening for most people – on average, most people are happier in their youth and early adulthood than they are at the end of their 40s and start of their 50s. Over the course of our 50s, the level rises again significantly and many experience a happiness peak in their 60s and early 70s – as long as they remain in fairly good physical health.

Another perspective is that of personal experience. In this case, there is a very simple answer. When we are so engrossed in an activity that we completely lose track of time, i.e. when we get into the “flow” – that is proven to make us happy. Although, strictly speaking, we only realise this when we look back, because when we’re actually concentrating, it’s as though we’re not really

there. But when we come back and realise that we forgot about ourselves completely for a while – that gives us a happiness kick.

Ultimately, it is worth looking at our concrete actions – i.e. at how we actually spend our time. The fields of positive psychology and behavioural economics have come up with some clear recommendations in this area over the last few decades: it is important to take time to do something good for yourself. One of the best drivers of happiness is light endurance sport, ideally outdoors. If we could create a pill that has the same effect, it would be a very effective antidepressant. Practising meditation is also proven to promote happiness. Taking a broader view, we should spend as much time as possible with real friends and family. We should devote ourselves to activities that give our lives meaning. A reliable way of doing this is to use our energy to help others. We should spend our time on activities that relate closely to our own innate strengths. How can you tell when you’ve found the right activity? If, for example, you start something new and find that you learn a lot unusually quickly, you should stick with it. All of these factors are strong candidates for happiness and success.

In your opinion, what does all of this have to do with Kärcher?

At this point I have to admit that I don’t do any work in our house or in our huge garden. I’m all fingers and thumbs and I don’t enjoy it. My wife does a lot of it herself; otherwise we employ tradespeople or service providers. It refers back to the question we were discussing before: what am I spending my time on, and when should I sacrifice money so I have time for other things?

» It is important to take time to do something good for yourself. One of the best drivers of happiness is light endurance sport, ideally outdoors. If we could create a pill that has the same effect, it would be a very effective antidepressant. «

Dr Nico Rose, expert on positive psychology

But I can definitely see that the process of pressure washing with a Kärcher device is an ideal breeding ground for a “flow” – the special feeling of being completely wrapped up in an activity – if you are attracted to the activity in question. Flow is only created under very specific conditions. This includes having a clear objective, being able to work without distraction with an appropriate tool, and being aware of your own progress at all times. If you can create these conditions while pressure washing, then Kärcher can be a part of your happiness. ■

*PNAS, Proceedings of the National Academy of Sciences of the United States of America

More on the link between time and happiness: www.kaercher.com/difference



**HAPPINESS AROUND THE GLOBE:
FACTS ABOUT THE WORLD HAPPINESS REPORT**

- The World Happiness Report was created in 2012. It is published once a year.
- The report, which is published by the United Nations Sustainable Development Solutions Network, defines happiness as a measure of progress and as a political objective.
- According to the 2017 report, the happiest people live in Norway, followed by Denmark, Iceland and Switzerland.
- International researchers and experts studied 155 countries and surveyed over 3,000 people per country.
- The results are based on criteria such as GDP, life expectancy, residents’ self-perception, the strength of social support, and confidence in government and companies.

EVERDRILL

Using a high-pressure cleaner as an ice drill

After the Arctic and the Antarctic, the glaciers in the high mountains of Asia are the third largest store of fresh water on the planet. Their meltwater fills the continent's major rivers and supplies drinking water for billions of people. Due to their high altitude, these areas are particularly affected by climate change. The consequences for the region are fatal, with the threat of avalanches, floods and, in the long term, a significant shortage of water.

It is therefore extremely important to understand what goes on in these bodies of ice, which is the task of geologists such as Dr Duncan Quincey from the University of Leeds and Professor Bryn Hubbard from Aberystwyth University in Wales. In the future, computer models should be able to make predictions about the movements of the ice giants as well as other changes. This will require data from inside the glaciers, which is very difficult to obtain. Sensors at various depths measure, for example, the temperature or the ice density.

Since 1992, Professor Hubbard and his colleagues have been using high-pressure cleaners from Kärcher to drill into the ice. The robust, petrol-powered hot water models work with collected meltwater. A detail nozzle at the end of the high-pressure hose serves as the drill head and is lowered into the ice by means of a pulley.

In spring 2017, the method was used in the Himalayas for the first time in the "Everdrill" project, the aim of which was

to study the Khumbu Glacier on Mount Everest. This involved drilling holes up to 150 metres deep in the highest glacier in the world. The altitude was the main challenge for the team and their equipment: at 5,000 metres above sea level, the air pressure and oxygen levels are reduced by 50 per cent. This limits the performance of combustion engines considerably. Transport was also a challenge – a helicopter can only transport a load of around 200 kilograms at this altitude.

Despite all the obstacles, the team succeeded in drilling several holes at three points on the glacier by the end of the project, for which they spent five weeks in total on-site. Subsequent expeditions will now analyse the data from the sensors installed in the glacier, and plans are already in place for the next drill holes, which will be even higher and even deeper than their predecessors. ■



Interesting background information on the collaboration with Kärcher and the project team: www.kaercher.com/difference

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Professor Hans-Christoph Rademann has been the director of the Internationale Bachakademie Stuttgart since 2013.



CULTIVATING MUSICAL HERITAGE, NURTURING YOUNG TALENT

The Bachakademie is devoted to European music culture and is committed to keeping its spirit alive.

There are quiet voices here and there, a few chairs being moved, a final throat being cleared, then the conductor raises the baton. The hall falls silent, the first note sounds and the listeners are taken on a journey of the imagination. Classical music events have a special atmosphere. And the concerts given by the Bachakademie in Stuttgart guarantee exquisite artistry of the very highest standard. This is no surprise, as academy director and conductor Professor Hans-Christoph Rademann is an extraordinarily versatile artist who is passionately devoted to performing and rediscovering old music as well as debuting and cultivating new music.

Professor Rademann, what does the Bachakademie do?

Our institution is unique worldwide. The music of our namesake, Johann Sebastian Bach, takes centre stage. But at the same time, we strive to introduce our audiences to a broad spectrum

of music. Our programme includes events and guest performances all over the world. Supporting young people is one of our main aims, which is why we have launched the BACHBEWEGT! ("Bach moves!") programme.

How does the academy support young musicians?

All over the world today, you will find conductors, singers and instrumentalists who have attended our masterclasses in Stuttgart. We do a great deal to support the musical education of children and young people. To take just one example: in 2017, to celebrate the anniversary of the Reformation, we staged an acoustically and visually reinterpreted version of the St Matthew Passion by Johann Sebastian Bach. The event featured around 100 pupils from various different schools as dancers, performing together with professional musicians – a combination which went down extremely well with the audience. We produced a DVD about the project which was nominated for an international prize.

What role do collaborations with the business world play?

The Bachakademie and its partners are committed to "high tech and high culture". Thanks to our namesake and his music, we have the highest conceivable quality standard to live up to. We know that Kärcher has equally high standards – otherwise it would not have become a global leader. We have had a close and extremely valuable relationship for many years now. The same goes for other companies in the region. Without these connections, we would not be able to carry out many of our projects. In this respect, I believe the combination of "high tech and high culture" is a real showcase project! ■

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<http://worldhappiness.report/>
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KÄRCHER is the leading global provider of technology for the cleaning of transport equipment, buildings and surfaces as well as for the purification and pumping of liquids. The 3,000-strong product portfolio includes devices for private households and cleaning systems for commercial, industrial and municipal operators. The family-owned family enterprise has a global presence with 40,000 trading partners and 50,000 service centres. The portfolio includes high and ultra high-pressure cleaners, vacuum cleaners and steam cleaners, pumps for home and garden, watering systems, sweepers and scrubber driers, gantry car washes, cleaning agents, dry ice blasters, drinking water and wastewater treatment systems and water dispensers. Kärcher offers everything from a single source: machines, accessories and cleaning agents, consulting, customer service and digital services. A high level of innovation is the most important growth factor for the company: 602 of its patents were active at the end of 2017. In the financial year 2017, the cleaning specialist achieved a turnover of more than EUR 2.5 billion, the highest in the company's history.



www.kaercher.com