Industrial Parts Cleaning

Sustaining value, improving processes, lowering costs
Cleaning solutions from Caramba: Success factor in the industry

Clean solutions and optimised cleaning processes

Cleanliness is a key factor for quality and economy in production, further processing and maintenance. Clean surfaces are indispensable for
- smooth, permanent operation of facilities
- optimal processing and subsequent finishing of workpieces and components
- efficient maintenance
- sales of final products and services

Good cleaning constitutes the basis for subsequent coating, such as corrosion protection, that can truly fulfil its function only on this basis. In addition, clean surfaces are an absolutely essential prerequisite for precise, troublefree manufacturing.

Cleaning often harbours significant optimisation potentials for companies. This requires a solution that harmonises various factors - from the right chemical product to seamless integration of cleaning into the respective production or maintenance processes.

The chemistry is right... and so is our consultation.

Cleaning, altering, protecting with chemical products - all this is presented by the name Caramba, the brand with a rich tradition as hardly another. Today Caramba belongs to the official "Brands of the Century".

With intensive research and development at three German locations and solutions for the felt advantage of private, commercial and industrial users we keep this reputation fresh, each day.

In the area of industrial parts cleaning, more and more companies seize the opportunity of utilising benefits such as value preservation, quality increase and cost efficiency with solutions from Caramba. Because Caramba as innovative chemical company develops highly effective products while ensuring optimal application through well-founded consultation as business partner.

Caramba. The cleaning solution of choice in many applications.

Optimum, safe operation and protection of the high investments is important in all areas of industrial processes. In the manufacturing and finishing industry, precision and smooth processes rank at the top of the list of successful companies. Caramba’s cleaning solutions help to meet these requirements in a wide range of applications, such as manufacturing, metalworking, maintenance and storage.

Know-how and products from Caramba are used to create first-class foundations for success in a wide variety of applications and industries.

From vague knowledge to clear understanding.

When it comes to materials and components from iron, steel, plastics, to the contamination of drawing and punching oils, greases and emulsions and even slurries or limescale: The Caramba I-Line contains just the right chemical solution for the key cleaning tasks... in many cases also with temporary corrosion protection.

We’re ready to advise you about all aspects of the matching product. The "how to" of application is just as important at this. Our specialists from the chemical and application engineering departments will closely cooperate with you right from the start when it comes to the dosage, cleaning process and process integration. Together with you and for you they will utilise the efficiency potential hidden in your cleaning processes.

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How new I-Line products must perform
Each individual I-Line product shall help optimise your cleaning processes. It must also meet high standards, for example:
- Improved cleaning performance
- Lowest possible energy costs
- As little marking as possible
- - with very good effect

Do you need products with special properties beyond the current I-Line range?
Contact us.

Current product innovations: New specialists for your requirements

With the I-Line for industrial cleaning, we are making an important contribution to added value and process optimisation for more and more customers. Caramba is constantly focusing on meeting the needs of the industry - and has now specifically expanded the I-Line with new products that round off and complete the performance spectrum with special properties.

New possibilities for small loads carrier cleaning
The new I-Line AD-35 for crate washing removes even particularly stubborn impurities from the food sector effortlessly. The high-performance I-Line XN-35 ensures first-class drying results. The special surfactant combination of this innovative crate dryer ensures that even very non-polar plastic surfaces are quickly wetted. As a result, water runs off drip-free and streak-free on plastic crates.

The specialist against biological adhesion
With the I-Line XA-55 you benefit from a Biocide-containing system cleaner that removes biological residues extremely effectively. The cleaner convinces by its broad spectrum of action in the removal of bacteria, yeasts and moulds. It is free of formaldehyde splitters and suitable for steel, non-ferrous metals and aluminium alloys. With these properties, the I-Line XA-55 is also the ideal cleaner for cooling lubricant systems.

Strong ultrasonic cleaning can be so gentle
The I-Line AE-60 is perfect for ultrasonic cleaning due to its special surfactant combination of fast wetting and degreasing components. Both oils and greases as well as particulate impurities are cleaned efficiently and gently, even from complex, finely structured parts.

Stubborn soiling on non-ferrous metals? No problem!
The I-Line AD-45 tackles oils and greases as well as particulate impurities and is the specialist for non-ferrous metals. Even stubborn impurities don’t stand a chance. The demulsifying surfactant mixture of this spray cleaner creates the conditions that oils in the cleaning bath can be easily separated with an integrated oil separator.

The advantages of the salt-free cleaner in high-end quality
The I-Line AD-25 spray cleaner is the ideal choice when it comes to effective degreasing. Excellent demulsifying properties and - also in comparison to many products available on the market so far - characterized by low foaming. The absence of salt brings special advantages. The I-Line AD-25 leaves no unwanted salt residues behind after cleaning. The integrated temporary corrosion protection also makes it an ideal solution for the final cleaning of components. Subsequent hardening processes are no problem as well.
## Caramba I-Line at a glance

Our powerful, water-based I-Line products specifically combine effect, simply use and high economy.

<table>
<thead>
<tr>
<th>Category</th>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral cleaners</td>
<td>ND-10</td>
<td>Especially low-foaming neutral cleaner</td>
</tr>
<tr>
<td></td>
<td>AD-10</td>
<td>Mild alkaline cleaner, especially low-foaming</td>
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<tr>
<td></td>
<td>AD-20</td>
<td>Alkaline, especially low-foaming cleaner specifically for removing residues from surface finishing of metal components</td>
</tr>
<tr>
<td></td>
<td>AD-25</td>
<td>Salt-free cleaner for the removal of soiling from metal working; particularly recommended for subsequent heat treatment</td>
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<tr>
<td></td>
<td>AD-30</td>
<td>Strongly alkaline, especially low-foaming cleaner for major and extra heavy soiling</td>
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<td></td>
<td>AD-35</td>
<td>Chlorine-alkaline cleaner for small load carriers (KLT) and plastic crates</td>
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<tr>
<td></td>
<td>AD-45</td>
<td>Alkaline, silicate-containing cleaner for aluminium and non-ferrous metals; particularly low-foaming</td>
</tr>
<tr>
<td></td>
<td>AE-60</td>
<td>Emulsifying, mildly alkaline cleaner; particularly low-foaming and suitable for ultrasonic cleaning</td>
</tr>
<tr>
<td>Acidic cleaners</td>
<td>SD-10</td>
<td>Slightly acidic cleaner; aluminium and non-ferrous metals are lightened by gentle removal of the oxide layer; particularly low-foaming</td>
</tr>
<tr>
<td>Special products</td>
<td>XN-35</td>
<td>Plastic dryer for fast and energy-saving drying of small load carriers</td>
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<tr>
<td></td>
<td>XA-20</td>
<td>Passivation agent; used to reinforce corrosion protection in neutral to slightly alkaline cleaning and rinsing baths</td>
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<tr>
<td></td>
<td>XA-55</td>
<td>Microbiocidal system cleaner for cooling lubricant circuits, production and parts cleaning plants</td>
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<tr>
<td></td>
<td>XS-15</td>
<td>Very acid, colourless basic machine cleaner based on phosphoric acid for removing limescale and deposits in industrial parts cleaning facilities; can be used as spray and high-pressure cleaner</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application characteristics</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH value 1% (± 0,5)</td>
<td>Corrosion protection</td>
</tr>
<tr>
<td>Temperature range</td>
<td></td>
</tr>
<tr>
<td>Suitable for use in*</td>
<td></td>
</tr>
<tr>
<td>Non-ferrous metal</td>
<td>Aluminium</td>
</tr>
</tbody>
</table>

**Check for material compatibility recommended**
The Caramba effect: The ABC of process optimisation

Our formula for success goes beyond chemicals

Your requirements and processes are quite specific. Off-the-shelf cleaning solutions will often not do the job; many times they even cause unnecessary costs. We therefore take a close look at the situation and develop comprehensive process solutions for your specific tasks—applying the ABC method. This way we combine the best suitable chemistry with well-founded process experience to create the ideal solution.

A  Analysis and understanding of the process and specific requirements on site
B  Best practice consulting, assessment and recommendation of possible solutions
C  Caramba Effect: the concrete improvement, matching your individual requirements

The Caramba effect in jointed shaft engineering: an example

Machining operations

A wide variety of cutting tools and processes are used in machining processes. Accordingly, the bandwidth of necessary lubricants is large. Regardless of the lubricant: In the end it must be removed from the workpiece, because residues may be quite detrimental for further processing or storage of the workpiece.

The challenges

The lubricants and auxiliary fuels must be removed in the best possible manner— and that as efficiently and economically as possible. After all, utilising optimisation potentials in all stages of the production process matters amidst tough competition.

A  Accurate analysis

The company in the case study manufactures jointed shafts. In production, key components are broached internally on a machine tool. The processing media are removed immediately afterwards. Cleaning takes place on a spray cleaning facility at 60-70°C. A strongly alkaline cleaning agent is used. The cleaning results are satisfactory.

B  Best advice

Caramba has performed various test washes on the machine. Best results were achieved at this with the slightly alkaline, no marking required, product Caramba I-Line AD-10 at 3.5% concentration. Because of the good cleaning results already at low temperatures, the Caramba specialists recommended washing at 50 °C in the future.

C  Caramba Effect

With Caramba I-Line AD-10 a no marking required cleaning agent can now be used. This makes costly work safety regulations for storage, handling and disposal obsolete. In addition, energy costs can be lowered because identical washing results are already achieved at much lower temperatures. Also, time is saved because of the shorter heat-up phase of the facility.

- Safer to use
- Good cleaning results
- Lower costs

I-Line AD-10

- The mild alkaline cleaner effectively and efficiently removes drawing and punching oils, greases and heavy particulate soiling.
- pH value 11/vig (± 0,5): 9,0
- 25 l → Plastic canister
- 1,000 l → IBC container
Caramba. Innovative solutions through research, analysis and the latest technology

We get to the bottom of things.

In order to develop new solutions and improve existing ones, our specialists use a variety of modern analytical methods. This enables us to obtain high-quality results in all aspects of the cleaning processes and to simulate the special cleaning tasks of our customers. The findings form the basis for our individual developments and solutions.

Modern measurement of surface cleanliness

How clean is a surface? Only if this is measured can the effect of cleaning be assessed and optimised on this basis. Caramba makes use of the effect that oily residues lead to a lower surface tension. Our specialists test this surface tension with special test inks; they can thus draw conclusions about cleanliness. Especially for components, we use contact angle measurements to determine the surface tension. We have mobile technology at our disposal for this purpose, which enables us to precisely inspect the cleanliness of various component geometries and even very small components. We also use a stationary contact angle measuring device to determine the wetting of our cleaners on various surfaces.

In addition to film-type impurities, particulate impurities must also be made visible and measurable, as they increasingly occur after metal-processing steps, for example. We can do this, for example, with a special laser scanning microscope that visualizes metal chips and tiny microparticles.

In cleaning baths, we immerse ourselves deeply in the matter.

We also use modern UV-VIS spectroscopy. With this method we determine e.g. the proportion of non-ionic surfactants, the concentration of various salts such as phosphates and phosphonates, the chloride concentration or various metal ions and complexing agents.

Cleaning analysis for practical product and solution development

The customer-oriented development of new cleaners is a central claim of Caramba. To this end, we simulate the customer processes as accurately as possible. At our location, we use both spraying and ultrasonic systems. We have ideal conditions for cleaning originally soiled components (basket diameter 900 mm, usable height 500 mm, max. 500 kg). This enables us to test and develop our products under conditions that are as realistic as possible.

We put our cleaners to the test

We take the properties and effects of the Caramba I-Line very seriously. Among others, we test:

- Foaming behaviour over longer periods of time at application temperatures
- Demulsifying behaviour
- Corrosion protection with the grey cast iron chip test based on DIN51360-2
- Passivating properties against aluminium and other non-ferrous metals - with a test based on the ASTM F483-09 standard

We use our salt spray chamber and our climate chamber (condensation water test) especially for testing the corrosion protection properties in order to test the passivating effect of our products under very demanding conditions with high humidity and pronounced salt concentration.
Product effect is also a matter of adjustment

Caramba stands for state of the art chemical products. And we know from experience: A product can only unfold its full strengths and advantages through interaction – job, equipment, washing methods, temperature and dosage are critical factors. Additional practical questions from waste water optimisation to hazardous substances handling must be considered.

For this reason we do not simply sell our products – such as industrial parts cleaners – off-the-shelf. To make sure you can benefit from the full Caramba effect, our qualified application engineers become active for you. They meet you on site, in meetings, during test runs, training programs and at our laboratory.

We get to know your plant and machines, together with the current cleaning processes, advise you in all aspects of technology and chemistry, develop special solutions were needed, recommend process optimisations and determine the ideal dosages and application instructions for our products.

The bottom line: you will receive more than just a powerful cleaner; you will benefit from a balanced overall solution for your cleaning process. The benefits such as cost savings and time gained through less energy required, shorter heating phases, etc. are often clearly apparent.

Please do not hesitate contacting us with special questions, for example, about exceeded limits in the waste water area. We’ll be glad to develop custom solution recommendations.

Complete cleaning solutions covering all details

- Technical consulting
- Chemical consulting
- Consulting with problematic contamination
- Laboratory development of special solutions for contamination issues
- Optimisation of the cleaning process
- Solutions for waste water issues/exceeded limits
- Training of your staff (HACCP and hazardous substances training)
- Pointers for optimal, economic product use

We invite you to visit our website www.caramba.eu for more information and our contact details.
The pH value—basis for different effects

The pH value describes the acid, neutral or alkaline (basic) character of an aqueous solution. The scale ranges from 0.0 (very acid) to 14.0 (alkaline).

Acid washing solutions or cleaners have a pH value from 0.0 to 6.9. They are used to remove mineral soiling such as limescale, silicate and salt residues or also rust/rust film. The alkaline range of a washing solution ranges from 7.1 to 14.0.

Alkaline products are very suitable for removing oil and grease-containing soiling and caking. Products with a pH value of 7.0 are pH neutral.

The product range of Caramba I-Line covers the entire pH range and is therefore well equipped for diverse industrial cleaning tasks. For example, the strongly alkaline (>14) cleaner AD-30 is a specialist for most stubborn soiling and dried oils while XS-15 as strongly acid limescale remover (<1) consistently removes limescale and deposits in plants and parts cleaning machines, included rust film.

Surfactants: Active washing compounds in the Caramba I-Line

Surfactants play a critical role in cleaning. These active washing compounds (detergents) promote the dirt dissolution from surfaces. The special feature: Surfactants deposit themselves around the dirt particles and hamper lumping and settling—the particles are suspended in water. Surfactants thus prevent the dirt from adhering to the cleaned surface.

Demulsifying cleaners: best conditions for oil separation

Cleansers with a demulsifying effect make it considerably easier to remove oils and greases from the cleaning bath. The optimised surfactant systems separate oils and greases well from the material surfaces. Due to the demulsifying effect, these are not kept in the cleaning solution but separated from the water phase. Due to their lower specific density, they float up and can be continuously separated with an oil separator.

Demulsifying cleaners offer a particularly great advantage in the case of very heavily contaminated components. In contrast to emulsifying cleaners, the surfactants are hardly bound by the high oil content in the cleaning bath. As a result, the cleaning effect remains longer and the bath service life is significantly increased.

The Sinner circle: four parameters for cleaning success

What does cleaning success depend on? The Sinner circle, named after the surfactant chemist, Herbert Sinner, states it in a nutshell. The four factors are interrelated and can be changed in terms of the relationship to each other. This creates valuable maneuvering space to reach the desired cleaning results. For example, if the temperature shall be lowered, more emphasis must be placed on one or several other dimension(s): longer cleaning process, more mechanical cleaning and more effective chemicals would be the options in this example. The Sinner circle therefore represents one of the critical action models in pursuing the optimal cleaning process.

www.caramba.eu
Brand of the century

Caramba is a legend... a German brand known by everybody... and this for generations. The success story begins with the ingenious invention of a graphite-containing spray oil called Caramba. It removes rust, lubricates and protects.

Today, entire product ranges can be found under the umbrella of the brand – both for the private user and industry and trade. Chemical peak products for cleaning and protection of material finishes. For over 115 years.

Cooperation with renowned institutes

We are at your disposal

Just call us: Our field service and application consulting staff are glad to assist you.

Come visit our website as well.

www.caramba.eu

+49 (0)203 – 7786 111

This QR Code guides you directly to our products for industrial parts cleaning. Simply scan it with your smartphone or tablet via a QR code scanner.