



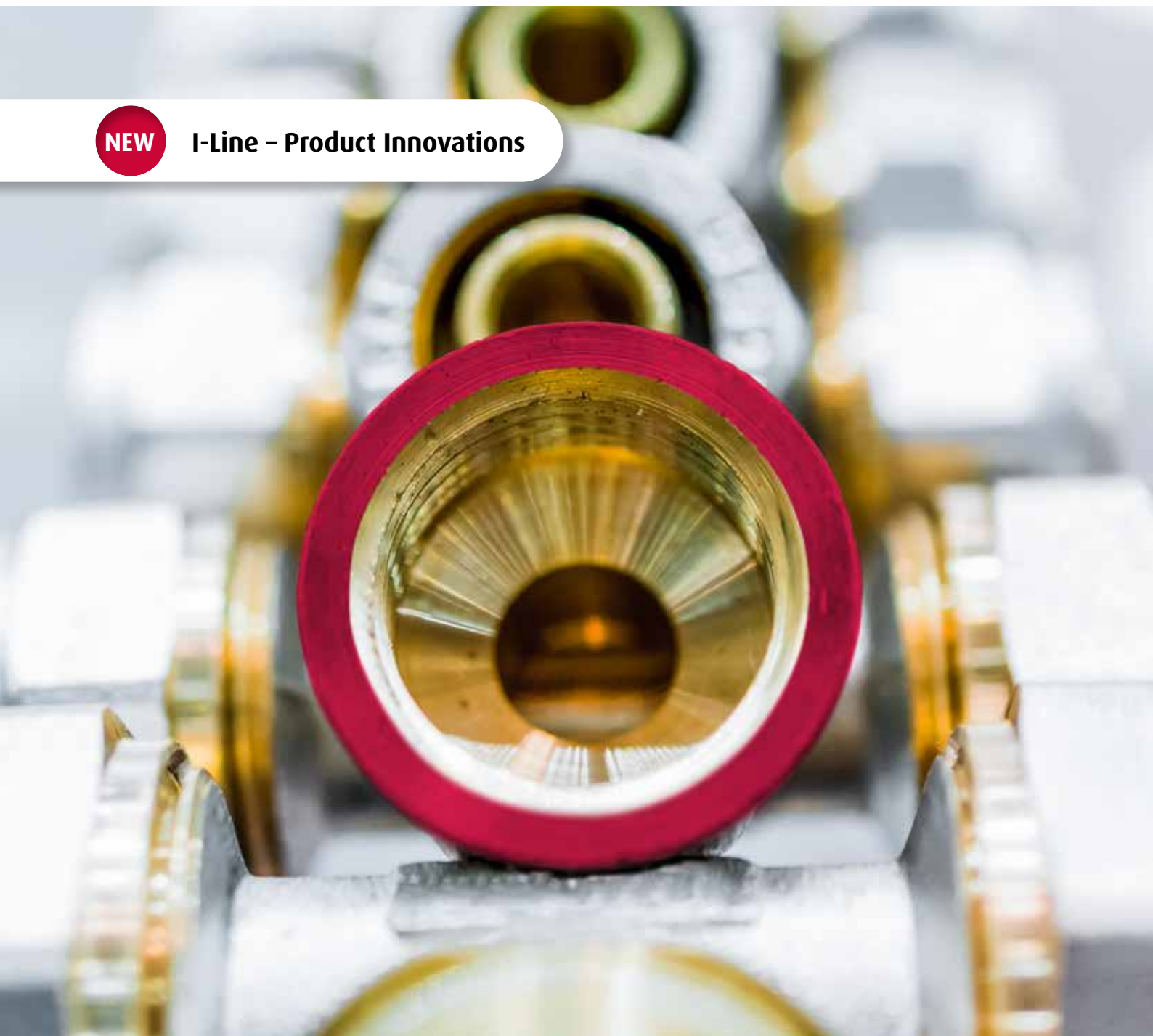
... das wirkt!

Industrial Parts Cleaning

Sustaining value,
improving processes,
lowering costs

NEW

I-Line - Product Innovations





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 the

- 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.



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.

Cleaning solutions from Caramba: Success factor in the industry



... das wirkt!

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.



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.

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.



Caramba I-Line at a glance

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



... das wirkt!

Category	Product	Description	Product description		Technical features				Application methods		Application characteristics					Materials					
			pH value 1% (± 0.5)	Temperature range	Corrosion protection	Emulsifying characteristics	Suitable for spray-cleaning	Suitable for immersion and ultrasound cleaning	Oils & greases	Particulate soiling	Polishes, lapping and slurries	Limescale deposits	Rust film	Iron, cast iron, steel	Stainless steel	Non-ferrous metal*	Aluminium*	Plastic (e.g. small load carriers)	Pack sizes and article numbers		
Neutral cleaner	ND-10	Especially low-foaming neutral cleaner	◇	8,5	40-80 °C	▬	D	▬		▬	▬	▬				●	●	●	●	●	10 l 62642501 1.000 l 626492
Alkaline cleaners	AD-10	Mild alkaline cleaner, especially low-foaming	◇	9,0	40-80 °C	▬	D	▬		▬	▬	▬				●	●	●	●	●	10 l 62672501 1.000 l 626792
	AD-20	Alkaline, especially low-foaming cleaner specifically for removing residues from surface finishing of metal components	NSF	10,5	40-80 °C	▬	D	▬		▬	▬	▬				●	●				10 l 62622501 1.000 l 626292
	AD-25	NEW Salt-free cleaner for the removal of soiling from metal working; particularly recommended for subsequent heat treatment	SALZ FREI	10,1	40-80 °C	▬	D	▬	▬	▬	▬	▬				●	●				10 l 62952501 1.000 l 629592
	AD-30	Strongly alkaline, especially low-foaming cleaner for major and extra heavy soiling, cleaned oils emulsify and can be removed without problem via oil separator		12,7	40-80 °C	▬	D	▬	▬	▬	▬	▬				●	●			●	10 l 62652501 1.000 l 626592
	AD-35	NEW Chlorine-alkaline cleaner for small load carriers (KLT) and plastic crates		12,5	40-80 °C		D	▬		▬	▬					●				●	10 l 8700160025 1.000 l 8700160085
	AD-45	NEW Alkaline, silicate-containing cleaner for aluminium and non-ferrous metals; particularly low-foaming		10,7	40-80 °C	▬	D	▬		▬	▬	▬				●	●	●	●		10 l 62882501 1.000 l 628892
	AE-60	NEW Emulsifying, mildly alkaline cleaner; particularly low-foaming and suitable for ultrasonic cleaning		8,4	40-80 °C	▬	E		▬	▬	▬	▬				●	●		●		10 l 62902501 1.000 l 629092
Acidic cleaners	SD-10	Slightly acidic cleaner; aluminium and non-ferrous metals are lightened by gentle removal of the oxide layer; particularly low-foaming		3,2	40-80 °C		D	▬		▬	▬	▬				●	●	●			10 l 62632501 1.000 l 626392
Special products	XN-35	NEW Plastic dryer for fast and energy-saving drying of small load carriers		5,9	35-65 °C			▬											●		10 l 8415360010 25 l 8415360025 210 l 8415360080 1.000 l 8415360085
	XA-20	Passivation agent ; used to reinforce corrosion protection in neutral to slightly alkaline cleaning and rinsing baths		9,7	15-80 °C	▬		▬	▬							●					10 l 6247251
	XA-55	NEW Microbiocidal system cleaner for cooling lubricant circuits, production and parts cleaning plants	BIO-ZID	9,3	20-40 °C			▬	▬							●	●	●	●	●	10 l 62961001 1.000 l 629692
	XS-15	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		<1	40-80 °C			▬		▬	▬	▬	▬			●					10 l 8700150010 25 l 8700150025 210 l 8700150080 1.000 l 8700150085

▬ Moderate soiling ▬ Conditional ◇ no marking required E Emulsifying 10 l | Plastic canister 25 l | Plastic canister 210 l | Plastic barrel 1.000 l | IBC container
▬ Stubborn soiling ▬ Good NSF NSF-certified D Demulsifying
▬ Extremely stubborn soiling ▬ Very good SALZ FREI Salt-free BIO-ZID Biocidal product

* 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



... das wirkt!

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

pH value 1%ig (± 0,5): 9,0

25 l | Plastic canister

1.000 l | IBC container

› The mild alkaline cleaner effectively and efficiently removes drawing and punching oils, greases and heavy particulate soiling.

- No marking required
- Especially low-foaming
- Demulsifying
- With temporary anti-corrosives

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 methods for the analysis of cleaning baths. These include, for example, the classical methods that our application engineers also use on site, such as titration to determine concentrations, pH values and conductivity. On the other hand, we have measurement methods at our site for determining the surfactant concentration in the cleaning bath, such as bubble pressure tensiometry.

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.





Caramba application engineering: Competency in action



... das wirkt!

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.

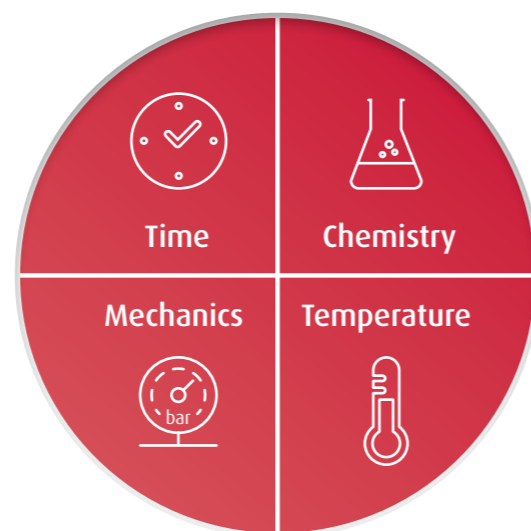




Good to know: practical chemical know-how

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 manoeuvring 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.

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.

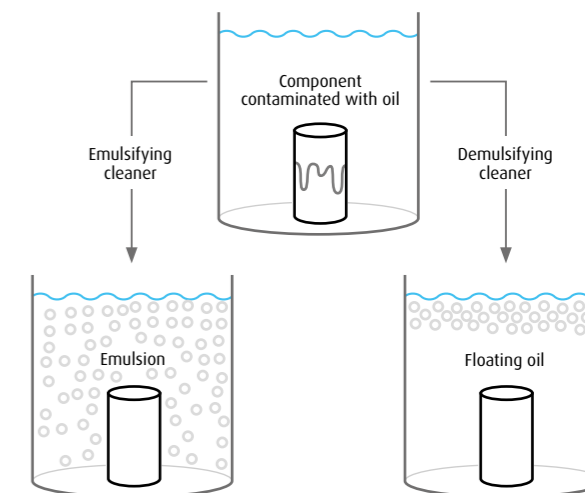
Surfactants: Active washing compounds in the Caramba I-Line

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

Cleaners 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.

Demulsifying and emulsifying cleaners in comparison:



Please contact us with any questions about our products, the Caramba scope of services and the opportunities of achieving solid advantages for your company with custom-optimised industrial parts cleaning



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.

+49 (0)203 - 7786 111

Come visit our website as well.

www.caramba.eu

Caramba Bremen GmbH

Bergedorfer Str. 6-8
D-28219 Bremen

Tel. +49 421 38 99 70

Caramba Chemie GmbH & Co. KG

Wanheimer Str. 334-336
D-47055 Duisburg

Tel. +49 203 7786 0

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

