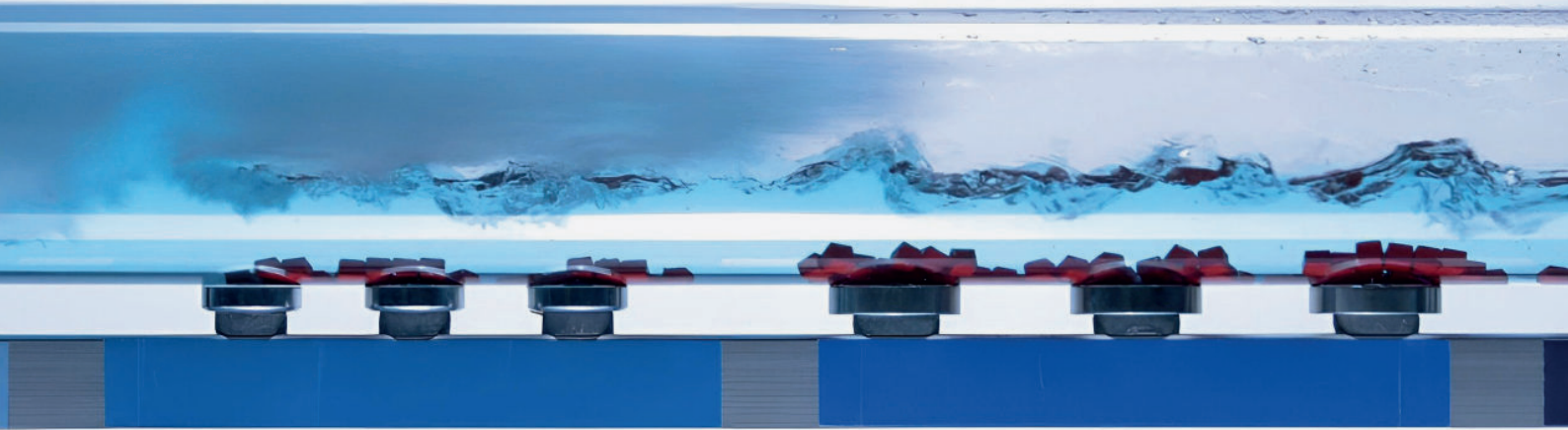




comprex[»]
ToolClean

KraussMaffei
Pioneering Plastics



Impulses that inspire.

We offer a cost saving and sustainable alternative to clean pipe systems that are difficult to access

comprex® is a purely mechanical cleaning process with pulses of filtered air and water. The cooling channels are supplied with pockets of air and water blocks using controlled compressed air and a small amount of water. The high speeds of the blocks

(up to 70 km/h - 44 mph) generate enormous turbulence mobilise the deposits and reliably discharges them. Even stubborn deposits can be removed from the system by changing direction.



Experience the impressive cleaning effect of our patented comple^x® cleaning process in our video.

The innovation from complex®

complex® ToolClean & ConnectBox.

Use complex® to clean the cooling and temperature control circuits of injection molds, counteract deposits and carry out preventive maintenance.

Advantages at a glance

Efficient, flexible, sustainable

- Mechanical cleaning with air and water
- Gentle cleaning process
- Circulation through the combination of ToolClean and ConnectBox
- Improved cycle times and product quality
- Stable production processes

Areas of application

Injection molding tool

- Temperature control circuits up to a maximum diameter of 12 mm and a length of 8 m

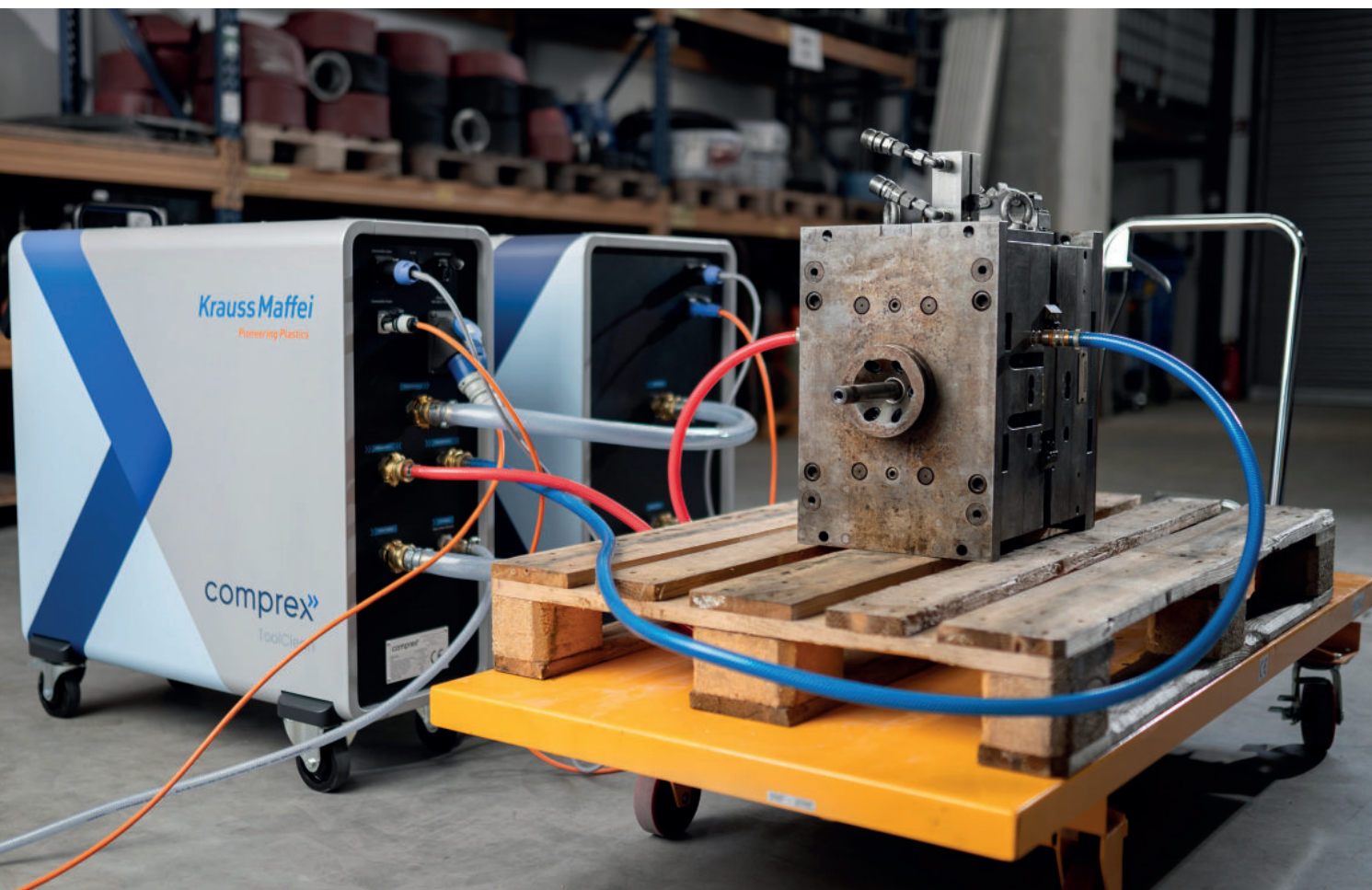
Injection molding machine*

- Cooling circuit
- Flange cooling

Temperature control unit*

- Internal piping and heat exchangers

*Assuming suitability



Advantages of comprex®

Why comprex® for cleaning tool channels?



„The test of the Comprex unit can be rated as thoroughly positive. The cleaning effect can be seen as very good, in some cases even heavy contamination could be removed. The unit was very easy to use and could be operated without any problems after a short briefing.“

Oliver Leis, Manager Sample Injection, framas

- Preventive cleaning of the injection molds ensures **optimum flow rate and cooling capacity**
- **Plug & Play:** no time-consuming staff training required
- Improves **process stability**, independent of geometry
- Cleaning of injection molds before initial commissioning, **before or after production**, in the tool shop or directly in the injection molding machine
- Patented cleaning technology – **without chemicals**
- **Energy saving:** Free lines – Less Pump capacity
- Successful solution for compliance with legal regulations, e.g. **CO2 sustainability**, energy management EN 50001
- **Validatable:** Improvement of the flow rate in the cooling channels is evaluated and documented

comprex[®] ToolClean ROI factors

Increasing the **service life** of the injection mold

- Prevent cross-sectional constrictions in the cooling channels and the associated tool damage
- comprex uses just water and air, therefore damage caused by chemical cleaning solutions are avoided

Increase in **product quality**

- Increased cooling capacity and process stability
- fewer rejects and production costs and therefore improved production efficiency and OEE - Overall Equipment Effectiveness
- 20% of rejects produced during injection molding are due to errors in mold temperature control

Increasing **production efficiency**

- improved cycle time and OEE, resulting in savings in production costs

Reduced **maintenance costs**

- Reduced maintenance effort, time and costs
- Cooling water pump operates at optimum efficiency, reducing wear and increasing service life
- Improved cooling and therefore lower maintenance costs

Saving **resources**

- Less cooling water required
- Cooling water pump works energy efficiently





Instructions for use
ToolClean: to the video



Instructions for use
ConnectBox: to the video

Product information on ToolClean

Technical data of complex[®] ToolClean

- Intelligent complex[®] software with intuitive user interface
- Adapted cleaning programs with automatic flow direction changes to increase effectiveness
- Tiltable touchscreen for ergonomic operation
- Interfaces and connections on the rear
 - > Compressed air supply min. 4 bar, max. 10 bar
 - > Water supply min. 2 bar / disposal
 - > complex[®] flow
 - > complex[®] return
- Power supply 230 V AC, power consumption < 100 W
- Ethernet RJ45 for industrial interface and remote access, 1 piece
- 230 V AC Schuko output
- Prepared for use with complex[®] ConnectBox for decompression, separation, filtration and circulation - with existing ConnectBox
- Cleaning water can also be discharged without ConnectBox
- Protective design (IP20)
- Mobile cleaning device with robust castors and handle
- Dimensions (WxHxD): 345 mm x 980 mm x 880 mm
- Weight: 85 kg
- Made in Germany



Technical data complex[®] ConnectBox

- Internal decompression unit for separating air and water
- External filter cartridges for water filtration, two cartridges for uninterrupted operation
- Integrated support for filter fleece
- Integrated waste water pump for water recirculation
- Collection tank for waste water (capacity 100 l)
- Emptying with ball valve
- Interfaces and connections on the rear,
- ½" female G-thread
- Power supply 230 V AC, power consumption < 500 W
- Direct data connection with complex[®] ToolClean
- Dimensions (WxHxD): 640 mm x 980 mm x 880 mm
- Weight: 95 kg
- Made in Germany

Decompression

- Expansion and separation of the two phases compressed air and water

Separation

- Pre-filtration of mobilized solids and deposits
- Internal filter fleece for documenting the cleaning result

Filtration

- If required, filtration of the rinsing water by Filter unit
- Multiple versions for uninterrupted operation

Circulation

- Integrated pump for returning the cooling water to the cooling system
- Direct disposal of waste water through outlet

Inject

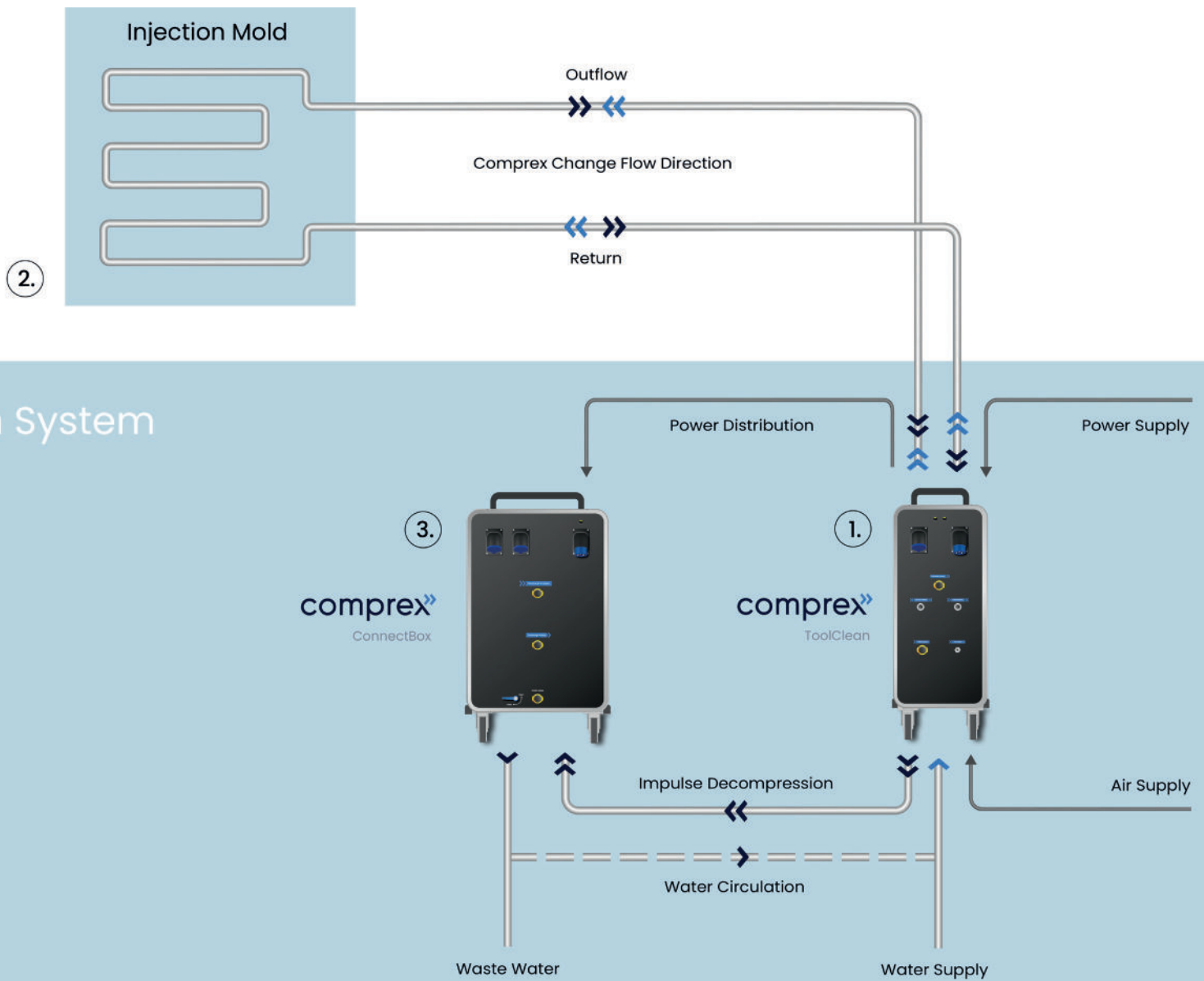
- Addition of surfactants possible in circulation mode

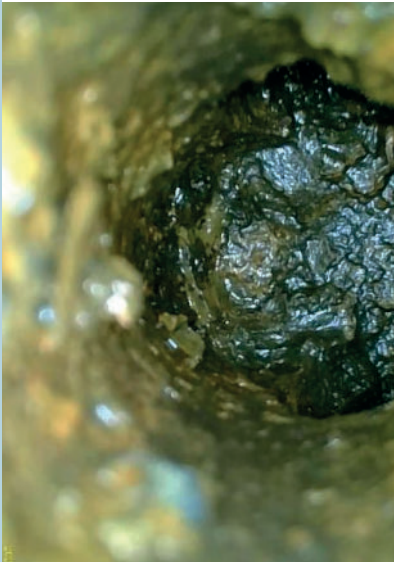
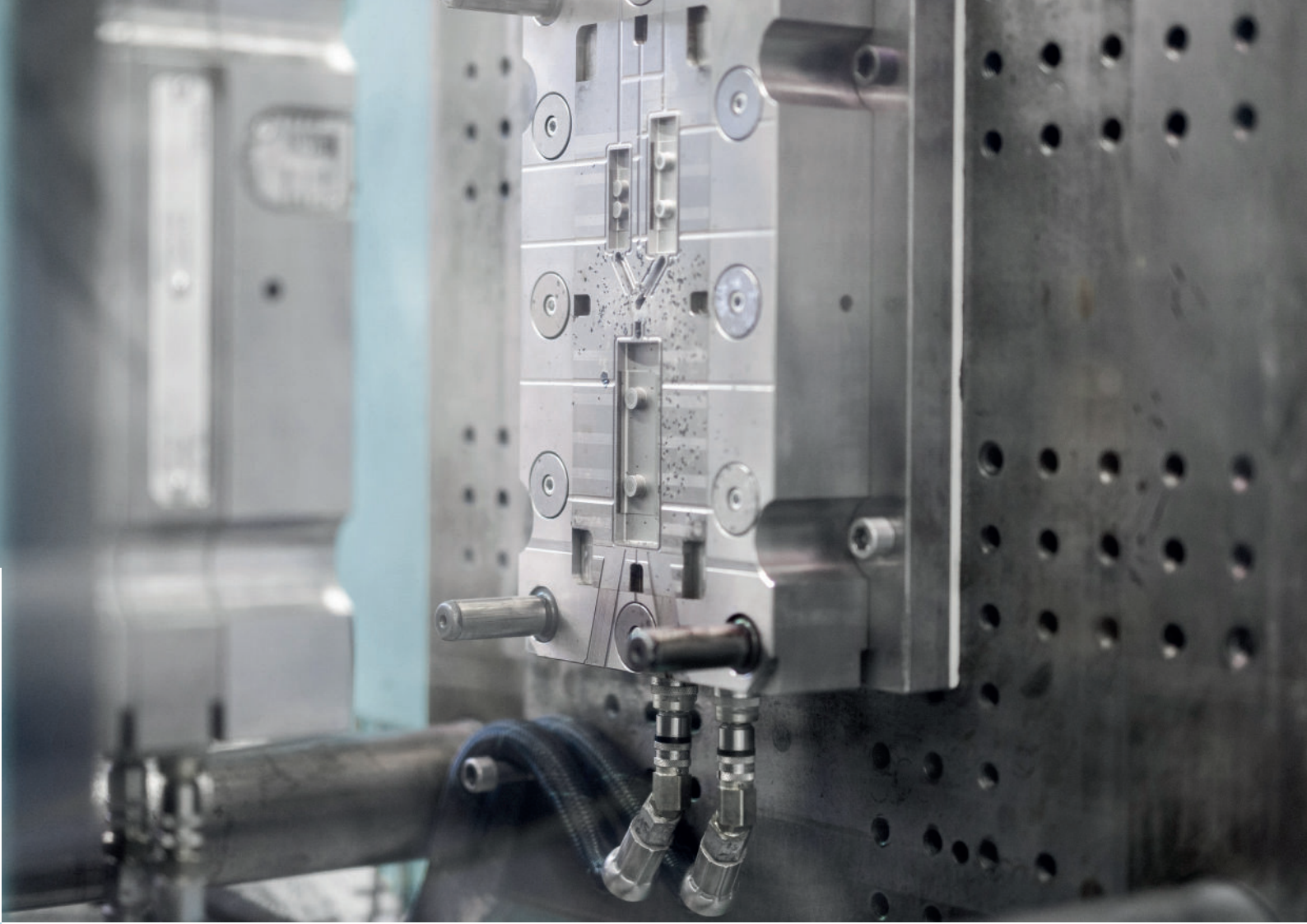


ToolClean System

„Hammann’s cleaning technology has become an integral part of the maintenance routine for our injection moulding tools. There is no alternative to complex® cleaning for many applications. Many thanks for the excellent and pragmatic service.“

MEG Rossbach GmbH, Felix Döhler, Technischer Leiter





Cleaning with complex® ToolClean

Results from Toolclean

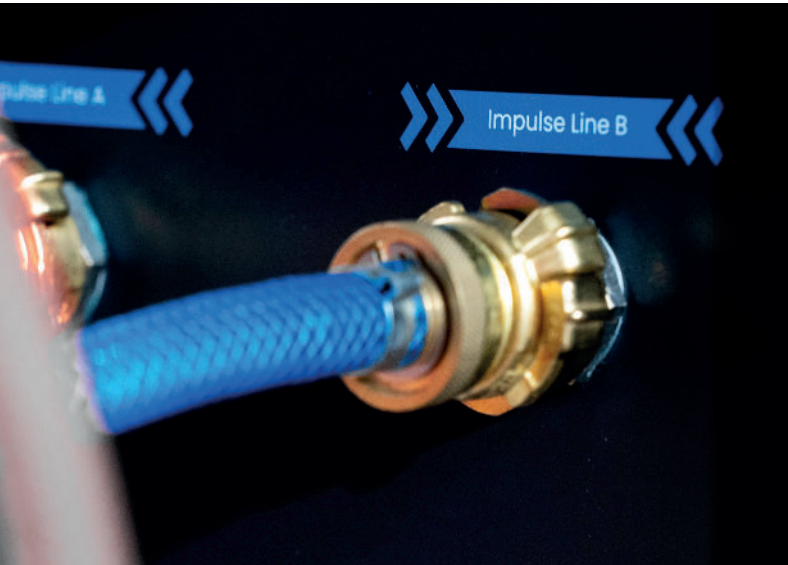
A few examples of what ToolClean can remove from the temperature control circuits:

Figure 1/2: Before and after cleaning of a cooling channel with black deposits

Figure 3/4: Discharge after cleaning a tool

comprex® vs. chemical cleaning

The complex® pulse cleaning process compared to conventional chemical cleaning systems



The most important criteria are summarized in the following comparison. The evaluations are based on customer results from practical experience, which have been obtained through direct comparisons.

70 km/h

Pulse velocity



>250

Industrial applications per year

>27

years of experience

Criterion	Cleaning		Remark	Comparism
	comprex®	chemical		
Cleaning time	+	-	High shear forces abruptly encounter complex Effective surfaces Chemicals generally require reaction time, material degradation takes place in layers	comprex® requires approx. 70% less time
Water consumption	+	-	Expanding compressed air converts small volumes of water into energy-charged pulses Classic water flushing relies on volume and flow rates, high water consumption	comprex® requires 65%-75% less water
Energy consumption	+	-	Lower energy consumption at the pump due to less water volume and cleaning time Increased energy consumption due to cleaning time and high volume flow rate	comprex® requires 65%-75% less energy
Compressed air consumption	-	+	Compressed air consumption during the pulse cleaning process Only for systems with the additional empty/dry option	
Side effects	+	-	No hazard potential, no special training or safety precautions Depending on the chemicals used, material damage may occur to fittings, seals and pumps (e.g. corrosion); protective equipment and training may be required.	
Disposal cost	+	-	Solids are separated / fleece, generally closed-loop operation possible (hazardous waste if historically conditioned) Depending on the chemicals, there are costs for contaminated hazardous waste	
TCO	+	-	Low operating costs, easy to service and operate, automated cleaning processes Costs for chemicals, storage, certified Personnel, processes requiring monitoring	
Solids, limescale, deposits, bacteria	+	-	In principle, the process can cover all applications The type and degree of soiling influence the Recipe	
Drying, emptying pipes	+	-	Automated process includes emptying and drying the pipes Depending on the system scope, technically possible as an additional function / option with additional effort	



Get in touch with us!

We would be happy to advise you in a personal meeting - also on the subject of cleaning as a service for larger pipes in your production.

Contact form: <https://comprex.de/toolclean>

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Continuously pursuing the next
innovation



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