

Coolant „ATM-COOLCUT“



Translation

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1 Cooling lubricant

1.1 Overview

Selection, regular care and, if necessary, change of coolant are tasks of the operator.

Within the scope of care are the properties of the cooling water (pH-value, amount of coolant and corrosion protection, noticeable changes, nitrate, and nitrite level) to be checked with the corresponding means (handheld refractometer, test stripes).

Here the physicochemical and microbiological regulations and the safety data sheet from the manufacturer are to be adhered.

NOTICE The values specified here refer to our coolant ATM-CoolCut.

Only by correct selection of the coolant as well as competent care a trouble-free operation can be ensured. In order to achieve the best results, we recommend our coolant ATM-CoolCut.

NOTICE The machine manufacturer cannot be held responsible for machine damage or performance restriction while working caused by the operator. That concerns especially:

- use of improper coolant from other manufacturers
- lacking or incorrect care of cooling lubricant
- use of improper preparation water
- use of additional products from other manufacturers
- use of fresh water or similar without the addition of cooling lubricant.

① In case of occurring problems the supplier of the coolant is to be contacted.

CAUTION

Health impairment

Biological and chemical load of the coolant

- Besides frequently occurring inflammations of ordinary wounds there is the possibility of skin rashes and allergic reactions up to the development of cancer-causing nitrosamines.
- **Observe local industrial health and safety regulations and accident prevention regulations, in Germany particularly the BGR/GUV-R 143.**
- **Observe the regulations and safety data sheets of the used coolant.**
- **Wear appropriate personal protective equipment where necessary when working with coolant.**
- **Don't insert any chemicals, foreign matter (incompatible materials (strong oxidants)) or waste materials.**
- **Ensure a sufficient aeration of the working area at machine standstill.**

CI.0110



NOTICE

Shortened lifetime of coolant

Contaminations and high temperatures

- Every contamination and high temperatures shorten the lifetime of the coolant.
- **Don't insert any chemicals, foreign substances (incompatible materials (strong oxidants)) or waste material.**
- **Perform measurements of coolant temperature on a regular base.**

NI.0083

1.2 Guidelines and regulations

In order to comply with its task in an optimal way and not to endanger the health of the machine operator, the coolant has to be handled and taken care of adequately.

As a basis therefor serve (in Germany):

- TRGS 611 (technical regulations for hazardous substances)
"Restrictions on the use of cooling lubricants which may give rise to N-nitrosamines during use"
- DGUV 109-003 (new designation) / BGR/GUV-R 143 (old designation)
"Activities with cooling lubricants"
- TRGS 400
"Risk assessment for activities with cooling lubricants"
- TRGS 401
"Danger due to skin contact - Determination, assessment, measures"
- DGUV 213-701 (new designation) / BGI 790-001 (old designation)
"BG/BGIA-Recommendation for the risk assessment according to Ordinance on Hazardous Substances – General section"
- product-related safety data sheet.

CAUTION

C2.0111

Reading the safety data sheets

Non-observance of safety data sheets

- If the safety data sheets of the used substances are not observed, there is the danger of personal injuries and damage to property.
- **Always observe the safety data sheets of the used substances.**



1.3 Blending of new cooling lubricant

NOTICE

N2.0082

Shortened lifetime of new coolant

Inadequate cleaning before refilling

- If the machine and the complete coolant circulation isn't cleaned thoroughly, the coolant lifetime gets shortened significantly after refilling.
- **Perform a thorough system cleaning before changing/refilling the coolant (→ chapter 1.6).**

NOTICE Blend the coolant according to manufacturer's instructions.

(When using ATM-coolant "ATM-CoolCut", the recommended concentration is about 4-8%).

⇒ If no special blender is available, clean tap water is filled into the recirculation cooling tank (in both chambers) and the appropriate amount of coolant is added with stirring.
The filling can also be performed alternating (water, coolant, water, coolant, ...).

① After filling, the blend should be circulated through the machine approx. 10 minutes before the measurements according to chapter 1.4 are performed.

1.3.1 Specification of preparation water (drinking water quality)

No.	parameter	limit values	dimension unit
1	total hardness	10-20	°dH (degree of total hardness according to German standards)
2	pH-value	7±1	pH
3	conductivity	< 1000	µS (micro Siemens)/cm
4	chloride	max. 50	mg/l
5	bacterial load	0	KBE
6	nitrite	max. 5	mg/l
7	nitrate	max. 50	mg/l

Element	Description
1	At deviations water being too hard can cause alkaline hydrolysis and water being too soft can cause frothing.
2	At deviations arrange possibilities of water treatment necessarily and take required measures.
3	A higher conductivity raises the risk of corrosion. Water treatment is to be done necessarily.
4	A higher chloride level raises the risk of corrosion. Water treatment is to be done necessarily.
5	The preparation water should have drinking water quality. Otherwise there is already a higher risk of microbial contamination.
6	A higher nitrite level can possibly lead to the development of cancer causing nitrosamines.
7	A higher nitrate level can possibly lead to the development of cancer causing nitrosamines.

NOTICE Please adhere to the current valid regulations and limit values of the regional water provider in addition.

1.4 Care, inspection and documentation

The care of coolant should take place periodically (once per week at lower use, otherwise correspondingly more often) at given intervals and should be documented. Therefor the operator is responsible.

The operator must ensure that the inspection schedule for set and actual value comparison contains at least following data:

1. looks, smell and other noticeable changes (e.g. corrosion, color change etc.)
2. pH-value
3. use concentration
4. nitrite level of water blended coolant
5. nitrate value of preparation water

The recommended use concentration of ATM-CoolCut according to product information lies at 4-8% and the pH-value between 8.8 and 9.4. Please note the refractometer factor: 2.0%/Bx. In this range the coolant develops its optimal cut and cooling effect.

If the concentration is too low, this can lead to corrosion at machine and work piece as well as bacterial contamination (i.a. bad smell).

When the coolant is infested by unwanted bacteria or fungi, the pH-value drops to values less than 8.8 in the course of time. If in addition nitrate or nitrite were present in the preparation water, bacteria can generate cancer-causing nitrosamines.

Therefor an organic pollution of the coolant shall be avoided in general, the pH-value shall always be above 8.8 and the nitrite level never exceed 20 mg/l.

If the concentration is too high, the coolant can froth.

For care, inspection and documentation of the coolant following utilities are necessary:

- emulsion-care-set for all measurements according to TGRS 611
- inspection schedule for water-mixed coolant (copy template → chapter 1.7)
- cleaning schedule (→ chapter 1.6)

NOTICE The blend should be circulated through the machine approx. 10 minutes before any measurement is performed.

1.4.1 Inspection of looks and smell of coolant (noticeable changes)

The coolant has to be observed daily for changed looks or smell.

1.4.2 Inspection of the nitrate value in preparation water

The nitrate value is only relevant for preparation of coolant with tap water.

- ⇒ Evaluate the nitrate value from time to time by request at the relevant local water provider or by using a test strip that is briefly held into the tap water whereupon the test strip changes color.
- ⇒ Compare this color change with the color scale that is printed on the test strips container and read off the corresponding nitrate value.

① According to TRGS 611 the nitrate level of preparation water must not exceed 50mg/l.

1.4.3 Inspection of the pH-value

The inspection of the pH-value should take place weekly at least and after every refill.

- ⇒ Evaluate the pH value with a test strip that is briefly held into the water mixed coolant whereupon the test strip changes color.
- ⇒ Compare this color change with the color scale that is printed on the test strips container and read off the corresponding pH-value.

① The pH-value has to be in the range of 8.8 – 9.4.

1.4.4 Inspection and adjustment of the coolant concentration

The inspection of the coolant concentration should take place weekly at least and after every refill, executed with a handheld refractometer.

The concentration should be in the range of 4 until 8%, in average approx. 6%. Any deviation makes a restoration of the required concentration necessary.

Concentration to low:

- ⇒ Add coolant with obvious higher concentration until an average concentration of approx. 6% is achieved.

Concentration to high:

- ⇒ Add preparation water and coolant until an average concentration of approx. 6% is achieved.
- ① If only preparation water is added, this can lead to a pH-value deviating in the finished mixture or the necessary value can't be achieved.

1.4.5 Inspection of the nitrite value

The inspection of the nitrite value should take place weekly at least and after every refill.

- ⇒ Evaluate the nitrite value with a test strip that is briefly held into the water mixed coolant whereupon the test strip changes color.
- ⇒ Compare this color change with the color scale that is printed on the test strips container and read off the corresponding nitrite value.
- ① According to TRGS 611 the nitrite level must not exceed 20 mg/l.
At values greater than 20 mg/l the coolant has to be exchanged completely (possibly a partial replacement is imaginable).

1.4.6 Inspection of coolant temperature

The inspection of the coolant's temperature should take place periodically during usage.

- ① The temperature should not exceed 35 °C/95 °F. Higher temperatures support the creation of N-nitrosamines and therefore should be avoided.

1.5 Additives

Following additives are available from us:

ATM-CoolAdd CU

- prevents the corrosion of copper, brass, and aluminum workpieces
- minimizes the solubility of heavy metals
- prevents the coolant and the workpieces from discoloration
- use concentration in water blended coolant:
0,05 – 0,2 %

Defoamer

- prevents unwanted foaming and destroys existent foam in the coolant
- use concentration in water blended coolant:
0,005 – 0,05 %

NOTICE Our coolant gets along without the addition of further agents in most cases. In all other cases, it is to be considered if a refill of the coolant including a system cleaning isn't more economical, hygienic harmless as well as simpler than the addition of additives. This applies especially as regard to the comparatively small filling volumes of our devices and thus the difficult dosing of the additives.

NOTICE When cutting materials containing nonferrous metal (e.g., alloys containing chromium, copper, zinc, etc.), corrosion prevention measures must be taken by the customer and additives added to the coolant.

Dosing of additives:

Quantity calculation:

$$\text{tank capacity [liter]} \times 10 \times \text{percentage} = \text{quantity}_{\text{additive}} [\text{milliliter}]$$

additive use concentration	ATM-CoolAdd CU	Defoamer
	0,05 – 0,2 %	0,005 – 0,05 %
tank capacity		
1 l	0,5 – 2 ml	0,05 – 0,5 ml
5 l	2,5 – 10 ml	0,25 – 2,5 ml
15 l	7,5 – 30 ml	0,75 – 7,5 ml
45 l	22,5 – 90 ml	2,25 – 22,5 ml
130 l	65 – 260 ml	6,5 – 65 ml
170 l	85 – 320 ml	8,5 – 85 ml
200 l	100 – 400 ml	10 – 100 ml

1.6 System cleaning and filling/refilling of the recirculation cooling system / cleaning schedule

NOTICE

N3.0082

Shortened lifetime of new coolant

Inadequate cleaning before refilling

- If the machine and the complete coolant circulation isn't cleaned thoroughly, the coolant lifetime gets shortened significantly after refilling.
- **Perform a thorough system cleaning before changing/refilling the coolant (→ chapter 1.6).**

Procedure:

- ⇒ Check the filling level of the cooling tank. It should be filled to maximum.
If this doesn't hold true, in this case (system cleaning) a simple refill with tap water is sufficient. (This isn't applicable to refilling during operation!)
- ⇒ Add 1-2% system cleaner to the coolant.
- ⇒ Let the system cleaner take effect for at least 24 hours while operating the machine normally.
- ⇒ Release (or dump, exhaust, etc.) the coolant completely.
NOTICE Adhere to the local wastewater regulations!
- ⇒ Perform a mechanical cleaning. Pay attention to also clean blind spots and covers.
- ⇒ Exchange filter materials (e.g. at centrifugal separators) if existing and clean the inner filter housing.
- ⇒ Flush the whole system with an 1% emulsion and completely empty the system again afterwards.
- ⇒ Refill the system with the desired concentration (→ chapter 1.3). It is useful to prepare the refill slightly higher concentrated initially.

1.7 Inspection schedule / measurement log (copy template)

device designation		preparation water nitrate	[mg/l]	
device no.		preparation water nitrite	[mg/l]	
coolant		preparation water total hardness	[°dH]	
coolant concentration		filling amount	[l]	
refractometer factor		filling date		
inhibitor		responsible		
inhibitor concentration				

[illegible]

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