



Chemical Technical Operator (CTO)

Practical workbook
Participant

Introduction

You use this practical workbook at the company to work on your practical experience. An important part of the training for the profession Chemical Technical Operator (CTO).

The entire training consists of the following parts:

- Obtaining the mandatory certificates
- Obtaining the recommended certificates
- Carrying out the practical assignments and gaining practical experience
- Completing the module with a final assessment

In the overview you can see all the requirements associated with CTO. The indicated certificates have been established as standard by the Orsima sector. In individual cases, it is possible for companies to deviate from this in a substantiated manner.

You will also see which career opportunities there are within the Industrial Cleaning sector.

Chemical Technical Operator
Core tasks
1. Preparing chemical cleaning activities 2. Performing chemical cleaning activities 3. Functional leadership
Legal professional requirements
-
Industrial requirements (mandatory)
VOL VCA SIR Adembescherming AB-B SIR Chemisch Technisch Operator
Industrial requirements (recommended)
Cursus Begeleiden (Orsima) Verplaatsen van lasten (ABvL) Werken met kleine blusmiddelen Basiskennis chemicaliën en gevaarlijke stoffen Heftruckcertificaat Flensverbindingen(gewoon)
Language requirements Dutch
'Listening' level 3 'Conversations' level 3 'Reading' level 3 'Writing' level 2
Language requirements Dutch
'Listening' level 3 'Conversations' level 3 'Reading' level 3 'Writing' level 2
Assistant Supervisor (Assistant) Site Manager

** Description of the language levels:*

1. *Is able to understand and use simple messages.*
2. *Is able to understand frequently used expressions. Can communicate on everyday issues.*
3. *Is able to understand key points from clear standard texts on familiar topics. Can express himself orally in most common situations. Can describe experiences, events and opinions.*
4. *Is able to understand the main idea of a complex text. Can express himself fluently and carry on a conversation without difficulty. Can write texts, can give an opinion and can argue.*
5. *Is able to understand long and difficult texts and can express himself fluently and spontaneously. Can use the language flexibly and effectively and can produce detailed texts.*

Get started with practice

This workbook contains practical assignments with which you can practice your skills. You carry out these assignments at your workplace.

During the training you will have the support of your practical supervisor. He will help you with taking steps and if you have any questions.

You can expect the practical supervisor to:

- Support you at all times
- Help you with making a study plan
- Answer your questions and consult with you
- Provide instruction on how to carry out practical assignments
- Assess assignments and indicate points for improvement
- Indicate when you are ready to take the final test

Each assignment you have completed must be signed off by your practical supervisor. You start with the introductory assignment.

Introductory assignment

What does the profession Chemical Technical Operator (CTO) look like?
The profession of CTO is described in this chapter.

1. Read the text about the profession carefully.

What does the Chemical Technical Operator do?

The CTO works in companies that belong to Industrial Cleaning and Ship Maintenance. The work is performed both at the company's own location and at the client's and relates to new and existing installations as well as parts of installations and structures or parts thereof.

The CTO is a professional who cleans equipment, installations and systems or who ensures that they are cleaned according to procedure.

He works with chemicals in surface treatment in combination with other cleaning techniques. He has specialized knowledge of equipment and of materials and substances used in the cleaning process.

The CTO receives information about the work, the material properties of the installation to be cleaned from the client. The client also provides information about appendages and seals, the workplace and the conditions under which the work must be performed. The CTO always works according to a predetermined work plan and ensures that the correct mixing ratios are used and that the cleaning agents have the correct pH value.

The CTO ensures that the chemical-technical cleaning equipment and accessories meet quality and safety requirements. He ensures that the SIR guidelines are observed and that the cleaning work is carried out in accordance with applicable regulations and agreements.

At least two people must be present at chemical-technical cleaning, of which at least one person is certified as CTO. The other is an assistant, for example a Cleaner.

The CTO completes the checklist for chemical-technical cleaning activities.

He supervises the execution of the work and determines whether work can start or must be interrupted.

All communication goes through the CTO. He is the point of contact for third parties. He instructs the assistant in the performance of the work and acts as a supervisor for young/new colleagues.

The CTO is aware of the possible consequences of his actions. He is very vigilant and capable of assessing whether he can solve a situation himself or needs help.

The CTO can be deployed flexibly at multiple workplaces and has adaptability. He can deal with changes in the cleaning process.

What do you need to do the job well?

In order to perform well, you have to meet the following preconditions:

- You are able to understand and speak Dutch and/or English.
- You obtained the 'Chemisch Technisch Operator' certificate
- You obtained the 'VCA VOL' certificate
- You obtained the SIR Adembescherming AB-B certificate
- You are at least 18 years old.
- You can act as a work permit holder.

The industry also advises you to complete the following training:

- Course 'Begeleiden' (Orsima)
- 'Werken met kleine blusmiddelen'
- 'Verplaatsen van Lasten (ABvL)'
- 'Kennis chemicaliën en gevaarlijke stoffen'
- 'Heftruckcertificaat'
- 'Werken aan flensverbindingen (gewoon)'

In the profession of CTO you perform cleaning activities. You are dealing with:

- Preparation of chemical cleaning work.
- Carrying out chemical cleaning work.
- Functional leadership.

When performing the work:

- You always check whether all employees can work safely.
- You always take into account the guidelines, procedures and safety regulations.
- You are continuously vigilant for unexpected interruptions and disruptions and call for help if you cannot solve it yourself.

Collect contact information*

2. Fill in the contact details.

Personal information

First name:

Last name:

Date of birth:

Company data

Company name:

Name of practical supervisor:

Phone number / Email address:

** This information is only used to support the execution of the module and to be able to issue a certificate as proof of passing this module.*

Create a step-by-step plan

To become an experienced CTO you have to do the work a number of times. This way you gain more and more work experience, and you know increasingly well what to do at what time.

Before you start work you will receive an instruction from the practical supervisor. When you have performed the work, the practical supervisor will give you feedback. This way, you will learn step by step to perform the work independently and well.

The step-by-step plan helps to consciously take learning steps. The mentor or company draws up the step-by-step plan. The practical supervisor will help you with the implementation of the step-by-step plan. You perform each practical assignment at least three times. The practical supervisor will indicate when it is sufficient.

There are a total of 11 different assignments.

Assignment 1. Construction of a circulation system with hoses.

Assignment 2. Construction of a circulation system with fixed pipes.

Assignment 3. Perform cleaning with circulation.

Assignment 4. Perform point strength check.

Assignment 5. Perform leak test.

Assignment 6. Working with inhibitors.

Assignment 7. Dosing chemicals.

Assignment 8. Perform cleaning immersion method.

Assignment 9. Empty baths and prepare for transport.

Assignment 10. Rinse installation.

Assignment 11. Dispose of wastewater chemicals.

3. Complete the step-by-step plan part 1.

- Determine a week in which you will start.
- Think about how many assignments you will do in one week.
- Agree with the practice supervisor when he assesses and gives feedback

Step-by-step plan part 1 – Name:				
Schedule Date/week	Assignment	Done yes/no	Assessed yes/no	Sufficient yes/no
	First time 1. Construction of the circulation system with hoses.			
	First time 2. Construction of the circulation system with fixed pipes.			
	First time 3. Carry out cleaning with circulation.			
	First time 4. Perform point strength check.			
	First time 5. Perform leak test.			
	First time 6. Working with inhibitors.			
	First time 7. Dosing chemicals.			
	First time 8. Carry out cleaning with immersion method.			
	First time 9. Empty baths and prepare for transport .			
	First time 10. Rinse installation.			
	First time 11. Dispose of waste water containing chemicals.			
	Feedback/assessment moment			
Schedule Date/week	Assignment	Done yes/no	Assessed yes/no	Sufficient yes/no
	Second time 1. Construction of the circulation system with hoses.			

	Second time 2. Construction of the circulation system with fixed pipes.			
	Second time 3. Carry out cleaning with circulation.			
	Second time 4. Perform point strength check.			
	Second time 5. Perform leak test.			
	Second time 6. Working with inhibitors.			
	Second time 7. Dosing chemicals.			
	Second time 8. Carry out cleaning with immersion method.			
	Second time 9. Empty baths and prepare for transport			
	Second time 10. Flush installation			
	Second time 11. Dispose of waste water with chemicals			
	Feedback/assessment moment			
Schedule Date/week	Assignment	Done yes/no	Assessed yes/no	Sufficient yes/no
	Third time 1. Construction of the circulation system with hoses.			
	Third time 2. Construction of the circulation system with fixed pipes.			
	Third time 3. Carry out cleaning with circulation.			
	Third time 4. Perform point strength check.			
	Third time 5. Perform leak test.			

	Third time 6. Working with inhibitors.			
	Third time 7. Dosing chemicals.			
	Third time 8. Carry out cleaning with immersion method.			
	Third time 9. Empty baths and prepare for transport			
	Third time 10. Flush installation			
	Third time 11. Dispose of waste water with chemicals			
	Feedback/assessment moment			

Also make a step-by-step plan for the mandatory certificates.

- How long does the training take?
- When can you start the training?
- How much time do you need to prepare for the exam?
- When can you take the exam?

4. Complete the step-by-step plan part 2.

Step-by-step plan part 2 – Name:			
Schedule Date/week	'VCA-VOL'	Done yes/no	Sufficient yes/no
	Training started		
	Education completed		
	Exam done		
Schedule Date/week	SIR 'Adembescherming AB-B'	Done yes/no	Sufficient yes/no
	Training started		
	Education completed		
	Exam done		
Schedule Date/week	'Chemisch Technisch Operator'	Done yes/no	Sufficient yes/no
	Training started		
	Education completed		
	Exam done		

And of course you can also include one or more recommended certificates in the step-by-step plan.

- How long does the training take?
- When can you start the training?
- How much time do you need to prepare for the exam?
- When can you take the exam?

5. Complete the step-by-step plan part 3.

Step-by-step plan part 3 – Name:			
Schedule Date/week	‘Verplaatsen van lasten’ (ABvL)	Done yes/no	Sufficient yes/no
	Training started		
	Education completed		
	Exam done		
Schedule Date/week	‘Begeleiden’ (Orsima)	Done yes/no	Sufficient yes/no
	Training started		
	Education completed		
	Exam done		
Schedule Date/week	‘Basiskennis van chemicaliën en gevaarlijke stoffen’	Done yes/no	Sufficient yes/no
	Training started		
	Education completed		
	Exam done		
Schedule Date/week	‘Werken met kleine blusmiddelen’	Done yes/no	Sufficient yes/no
	Training started		
	Education completed		
	Exam done		
Schedule Date/week	‘Vorkheftruck’	Done yes/no	Sufficient yes/no
	Training started		
	Education completed		
	Exam done		
Schedule Date/week	‘Werken aan flensverbindingen’ (gewoon)	Done yes/no	Sufficient yes/no
	Training started		
	Education completed		
	Exam done		

Assignment 1. Construction of a circulation system with hoses



Image 1 Circulation system with hoses



Image 2 Circulation system with hoses

Description

If you are servicing an installation for the first time, it is wise to discuss the consequences of chemical cleaning in advance.

You clean an object by circulating chemicals in it. You first make a connection with the object by attaching hoses. You can make a choice for the right hoses using the resistance table. You work with a predetermined work plan, including lead times and risk analysis (TRA).

You then connect the hoses correctly in the circulation system. During the execution of the work, you pay attention to safety.

Preparation

You consider which materials and tools you need for the job. You get the information from the proposed work plan

1. You choose the safest working method and collect the materials and tools.

Check:

- √ Working method aligned with the work plan
 - Installation can withstand acidic or basic chemicals (copper/galvanized iron/iron parts/plastic, etc.)
 - Time of chemical exposure is safe
 - Temperature is safe (50 – 70 degrees)
 - Extraction is OK (factory mist fumes)
- √ PPE tailored to product information sheets or SDS Sheets
- √ Tools and Materials
 - Sufficient rinsing water available to be used after cleaning

- Gaskets circulation pumps not older than 3 years
- √ Determine correct strength of chemicals
 - sorting barrels of chemicals depending on the pollution
 - dosing the strength based on the work plan

2. You check whether the location where you are going to work is safe.

Check:

- √ Chemical cleaning checklist completed
- √ LMRA performed
- √ Own safety
- √ Other people's safety
 - Safety with hazardous substances (usually acids or bases)
 - Skin protection
 - Eye protection
 - Respiratory protection

Performance

You connect the tools.

1. You connect the couplings and hoses and pay attention to the temperature and composition of the cleaning agent that is used.

Check:

- √ Drip trays installed
- √ Hoses connected and secured (especially pressure hoses)
- √ Links fitted
- √ Locking connections in order

2. You follow the instructions and regulations.

Check:

- √ You work meticulously
- √ You work at a good pace

Completion

You check whether the circulation system is ready for use.

1. You control the system.

Check:

- √ Checklist checked
- √ Spray pattern in order (no leaks)
- √ Check hoses
- √ Control links

2. Check operation of cleaning.

- √ pH value correct
- √ Temperature good
- √ Duration according to work plan

√ Point strength check (chemical to water ratio OK)

3. You ask your manager to check the work.

Check:

- √ Explanation of choice made
- √ Check done
- √ Circulation system built

Assignment 2. Construction of a circulation system with fixed pipes



Image 3 Circulation system with fixed pipes and baths

Description

You clean an object by circulating chemicals in it. You do that with an installation with baths. The chemical drums are loaded from a pallet at the entrance of the installation (tunnel) with a forklift and emptied tilted into the main bath (usually 5-12 m³)

You work according to a predetermined work plan. You perform the work in a chemo suit with chemical resistant boots, gloves and a full face mask with ABEKP3 filter.

After filling, you will be rinsed with a water hose to neutralize the chemo suit and mask.

Finally, you set the installation's own heating.

Preparation

You consider which materials and tools you need for the job. You work with a predetermined work plan, including lead times and risk analysis (TRA).

1. You choose the safest working method and collect the materials and tools.

Check:

- √ Working method aligned with the work plan
- √ PPE aligned with the work plan
- √ Tools and materials

2. You check whether the location where you are going to work is safe.

Check:

- √ Chemical cleaning checklist completed
- √ LMRA performed
- √ Own safety
- √ Other people's safety
- √ Hazardous substances safety

Performance

You fill the bath with chemicals.

1. You empty the chemical container in the main bath.

Check:

- √ Chemo suit and full face mask in order
- √ Chemical barrel repacked
- √ Chemicals poured into master bath

2. You follow the instructions and regulations.

Check:

- √ You work meticulously
- √ You work at a good pace

Completion

You take care of rinsing the chemo suit and switching on the installation.

1. You rinse the chemo suit with water. You go to the designated place where the waste water can be collected and which meets the environmental requirements.

Check:

- √ Chemo pack neutralized
- √ Mask neutralized
- √ Check that suit and mask are pH neutral

2. You set the installation's own heating.

Check:

- √ Heating set
- √ Installation ready to use

Assignment 3. Perform cleaning with circulation

Description

You build up the circulatory system. Then you will perform the cleaning by running the cleaning agent through the system. You pay attention to the temperature and the flow rate to achieve an optimal result. The temperature for chemical cleaning is usually between 50 and 55 degrees. You determine when the cleaning agent reaches a saturation point and then arrange for replacement. You work with a predetermined work plan, including lead times and risk analysis (TRA).

Preparation

You consider which materials and tools you need for the job. You get the information from the proposed work plan.

1. You choose the safest working method and collect the materials and tools.

Check:

- √ Work method tailored to work plan
- √ PPE tailored to work plan
- √ Tools and Materials
- √ Personal protective equipment

2. You check whether the location where you are going to work is safe.

Check:

- √ Checklist for chemical cleaning completed
- √ LMRA performed
- √ Own safety
- √ Other people's safety
- √ Hazardous substances safety

Performance

You perform the cleaning with circulation.

1. You clean the circulation system with the chosen cleaning agent according to the work plan.

Check:

- √ Drip trays installed
- √ Temperature OK
- √ Flow rate good
- √ Work pressure according to work plan
- √ Prevent emission to the environment (mist)
- √ Cleaning agent saturation point

2. You follow the instructions and regulations.

Check:

- √ You work meticulously
- √ You work at a good pace

Completion

You clean up the workplace and dispose of the waste safely.

1. You clean up the dirt.

Check:

- √ Sort residual waste by type
- √ Dispose of residual waste in an environmentally conscious and safe manner

2. You clean the materials and tools.

Check:

- √ Cleaning materials and tools
- √ Cleaning PPE
- √ Storing materials and tools

Assignment 4. Perform point strength check

Description

You perform a point strength check. You use this to test the concentration of chemicals in the water bath.

You add the detergent to the water bath and take a sample. You measure and check whether the concentration corresponds to the information in the proposed work plan. You repeat the actions until the correct concentration is reached.

You work with a predetermined work plan, including lead times and risk analysis (TRA).

Preparation

You think about which materials and tools you need and you get the information from the work plan.

1. You choose the working method and collect the materials and tools.

Check:

- √ Tools and materials
- √ Personal protective equipment

2. You check whether the location where you are going to work is safe.

Check:

- √ Own safety
- √ Other people's safety

Performance

You perform the point strength check.

1. You take a sample of the bath with the chemicals.

Check:

- √ Sampling
- √ You measure the concentration
- √ Based on the result, you determine the follow-up action

2. You follow the instructions and regulations.

Check:

- √ You work meticulously
- √ You work at a good pace

Completion

You finish the point strength check.

1. You check whether the concentration corresponds to the information in the work plan.

Check:

- √ Work plan checked
- √ Correct concentration achieved

2. You ask your manager to check the work.

Check:

- √ Explanation of choice made
- √ Check done

Assignment 5. Perform leak test

Description

You have built the circulation system and are now going to perform a leak test . You do a leak test before chemicals are introduced into the circulation system. You also keep an eye on the installation during cleaning to make sure there are no leaks.

You use an inert liquid (for example water) for this. You let the system operate at a maximum pressure and flow rate. You check that there are no leaks. After the leak test, if necessary, drain the system. When performing the work, you ensure that safety is guaranteed.

Preparation

You consider which materials and tools you need for the job.

1. You choose the safest working method and collect the materials and tools.

Check:

- √ Tools and materials
- √ Personal protective equipment

2. You check whether the location where you are going to work is safe.

Check:

- √ Own safety
- √ Other people's safety

Performance

You perform the leak test.

1. You bring the water into the circulation system and test for leaks.

Check:

- √ Inert liquid introduced into the system
- √ Maximum pressure tested
- √ Maximum flow rate tested
- √ No leaks

2. You follow the instructions and regulations.

Check:

- √ You work meticulously
- √ You work at a good pace

Completion

You finish the leak test.

1. You check the performed test and the result.

Check:

- √ Checklist checked
- √ Leak test performed well

2. You ask your manager to check the work.

Check:

- √ Explanation of choice made
- √ Check done

Assignment 6. Working with inhibitors

Description

You have built up the circulation system and check whether inhibitors need to be used in the cleaning fluid. The inhibitor protects the effect of the chemicals in the cleaning agent. The inhibitor ensures that no damage is caused to the installation during cleaning. The inhibitor can always be a different agent, depending on the material to be cleaned. You can often recognize deviations by a change in the color of the liquid, or leakages that occur because the material deviates from the specification in the work plan.

An example:

Suppose you carry out a chemical cleaning with acid where the pumps of the installation have iron blades.

Acid attacks iron.

There are two options:

- *Reduce the concentration of the chemicals*
- *Shorten the cleaning time*

If the installation cannot be cleaned properly as a result, add an inhibitor to the chemicals. The inhibitor protects the iron better, allowing you to continue rinsing longer or stronger.

The inhibitor is usually already added to the product by the supplier and several inhibitors may be needed to get the desired effect.

You follow the product information of the manufacturer. You work with a predetermined work plan, including lead times and risk analysis (TRA).

When performing the work, you ensure that safety is guaranteed. You use the correct PPE and take appropriate action based on the results of the test to correct things.

Preparation

You consider which materials and tools you need for the job. You follow the product information of the manufacturer and the work plan.

1. You choose the safest working method and collect the materials and tools.

Check:

- √ Follow work plan
- √ Product information producer
- √ Tools and materials
- √ Personal protective equipment

2. You check whether the location where you are going to work is safe.

Check:

- √ Checklist for chemical cleaning completed
- √ Wear correct PPE before starting work
- √ Own safety
- √ Other people's safety
- √ Hazardous substances safety

Performance

You monitor the inhibitors and pay attention to the possible reaction if the inhibitor ends up in the environment.

1. You check the cleaning fluid to which an inhibitor has been added.

Check:

- √ Drip trays installed
- √ Proper amount of inhibitor is dissolved
- √ Duration according to work plan
- √ Sampling according to work plan

2. You follow the instructions and regulations.

Check:

- √ You work meticulously
- √ You work at a good pace

Completion

You finish the test.

1. You check the performed test and the result.

Check:

- √ Outcomes assessed
- √ Appropriate action to correct things (if needed)

2. You ask your manager to check the work.

Check:

- √ Explanation of choice made
- √ Check done

Assignment 7. Dosing chemicals

Description

You analyze the supplied data and calculate how many chemicals you need. You calculate the volume to get the right concentration. You look at the regulations of the supplier of the chemicals (with the allowed margin).

You base your choices on the product information sheets or SDS Sheets (Safety Data Sheets) or a Work Instruction card (for hazardous substances). You check your results against the information from the proposed work plan.

You correctly insert the required chemicals into the circulation system and observe all safety requirements. You are wearing the correct PPE.

Preparation

You consider which materials and tools you need for the job. You base your choice on the regulations of the supplier of the chemicals and the information from the work plan.

1. You choose the safest working method and collect the materials and tools.

Check:

- √ Supplier's instructions followed
- √ Work plan followed
- √ Tools and Materials
- √ Personal protective equipment

2. You check whether the location where you are going to work is safe.

Check:

- √ Checklist for chemical cleaning completed
- √ Wear correct PPE before starting work
- √ Own safety
- √ Other people's safety
- √ Hazardous substances safety

Performance

You dose the chemicals and determine the content of the circulation system.

1. You dose the chemicals.

Check:

- √ Dosing according to manufacturer's instructions
- √ Measure pH value
- √ Point strength control

2. You determine the contents of the pipes.

Check:

- √ Fill pipes with inert liquid (e.g. water)
- √ Collect liquid in container and determine volume

3. You follow the instructions and regulations.

Check:

- √ You work meticulously
- √ You work at a good pace

Completion

You finish the dosing of the chemicals and you clean up the workplace and safely dispose of the waste.

1. You clean up the dirt.

Check:

- √ Sort residual waste by type.
- √ Dispose of residual waste in an environmentally conscious and safe manner.

2. You clean the materials and tools.

Check:

- √ Cleaning materials and tools
- √ Cleaning PPE
- √ Storing materials and tools

Assignment 8. Perform cleaning immersion method



Image 4 Immersion bath without circulation empty and soiled and filled.

Description

You clean products with the immersion method. This is a static way of cleaning, in which the liquid does not circulate.

You set up a system for this and determine how long the products must be immersed. You also determine when the immersion bath needs to be refreshed.

If circulation is required, add a submersible pump to the immersion bath.

The temperature for chemical cleaning is usually between 50 and 55 degrees.

You determine the mixing ratio based on the proposed work plan and the manufacturer's instructions.

Preparation

You consider which materials and tools you need for the job. You get the information from the proposed work plan and the manufacturer's instructions.

1. You choose the safest working method and collect the materials and tools.

Check:

- √ Work method tailored to work plan
- √ PPE tailored to work plan
- √ Tools and Materials

2. You check whether the location where you are going to work is safe.

Check:

- √ Checklist for chemical cleaning completed
- √ Wear correct PPE before starting work
- √ Own safety
- √ Other people's safety
- √ Hazardous substances safety

Performance

You perform the cleaning on the products.

1. You immerse the products and refresh the immersion bath.

Check:

- √ Correct immersion time
- √ Right time to refresh
- √ Install drip trays
- √ Prevent splashing
- √ Monitor temperature

2. You follow the instructions and regulations.

Check:

- √ You work meticulously
- √ You work at a good pace

Completion

You clean up the workplace and dispose of the waste safely.

1. You clean up the dirt.

Check:

- √ Sort residual waste by type
- √ Dispose of residual waste in an environmentally conscious and safe manner

2. You clean the materials and tools.

Check:

- √ Cleaning materials and tools
- √ Cleaning PPE
- √ Storing materials and tools

Assignment 9. Bathe emptying and prepare for transport

Description

When the installation has been cleaned, drain the bath. You collect the liquid and prepare the cargo for transport. This can be done by collecting the liquid in an IBC container or by sucking it up with a pressure vacuum truck. An important point of attention is the material of the tank in which the liquid is sucked up. It must be resistant to the liquid (usually a hazardous substance). If you work with an IBC, it must be provided with the correct label after filling.

Preparation

You assess the composition of the waste liquid and choose the form of transport.

1. You determine the composition of the waste liquid.

Check:

- √ Take a sample
- √ Determining waste liquid characteristics and classification (hazardous substances)

2. You determine the form of transport.

Check:

- √ Applicable laws and regulations
- √ Safety means of transport
- √ Hazardous substances safety

Performance

You empty the bath and prepare the liquid for transport.

1. Collect waste liquid.

Check:

- √ Transfer waste liquid into IBC
- √ IBC container provided with the correct label
- √ Sucking up waste liquid in vacuum truck

2. You follow the instructions and regulations.

Check:

- √ You work meticulously
- √ You work at a good pace

Completion

You clean up the workplace.

1. You clean the materials and tools

Check:

- √ Cleaning materials and tools
- √ Cleaning PPE
- √ Storing materials and tools

Assignment 10. Rinsing installation

Description

After chemical cleaning, the installation must be rinsed. This is necessary to make the pH value neutral again (pH value 7.5). The rinsing water has a low or, conversely, a high pH value, depending on the liquid used for cleaning. Acids and bases cancel each other out.

Acidic water has a pH value of 2
Basic water has a pH value of 13
Normal water has a pH value of 7.5

The dangers of acids and bases:

Acid burns your skin. You feel it immediately and can therefore take immediate action. With a base, your skin dissolves. You don't notice this immediately and when you do it is often too late.

After the installation has been emptied, rinse the installation with flushing water for 30 minutes. Then check whether the installation is clean.

You make the flushing water neutral (pH value 7.5) by adding acid or base. You measure the pH value with a pH meter or litmus paper.

The rinse water can be pumped off via the sewer or must be disposed of. This depends on the environmental permit and is to be determined in consultation with the client.

When the installation is clean, it can be put back into use and filled with production fluid.

When dealing with oil pipes, they are first blown dry before they can be filled again.

If you have a fixed installation with baths, then a post-cleaning with high pressure (max. 250 bar) will follow. This is necessary to also make the places that were not reached with rinsing as clean as possible.

Remark:

When flushing closed systems (pipes) it is difficult to determine whether a pipe is clean during chemical cleaning.

A part is often opened (valve, or plug) for inspection.

Sometimes a test is performed on steel pipes to determine the iron content that is taken up in the solution. This is then repeated every 30 minutes.

If an installation requires regular chemical cleaning, cleaning is usually carried out in stainless steel, but also in plastic.

With stainless steel, the welds are not resistant to strong acids in the long term.

Stainless steel baths with a plastic inner lining are recommended.

Preparation

You collect the materials and resources for rinsing the installation.

1. You collect the materials and tools according to the predetermined work plan.

Check:

√ Personal protective equipment

√ Tools and Materials

2. You check whether the location where you are going to work is safe.

Check:

√ Own safety

√ Other people's safety

√ Hazardous substances safety

Performance

You rinse the installation with flushing water.

1. You rinse the installation with flushing water.

Check:

- √ Rinse for 30 minutes
- √ Install drip trays

2. You check whether the installation is clean.

Check:

- √ pH value of the flushing water

3. You neutralize the wastewater.

Check:

- √ Add acid or base to pH value 7.5
- √ Observe safety regulations

Completion

You remove the waste water and clean the workplace.

1. You dispose of the waste water in accordance with regulations.

Check:

- √ Wastewater has a pH between 6 and 9
- √ Wastewater is a maximum of 33 degrees Celsius

2. You clean the workplace.

- √ Cleaning PPE
- √ Storing materials and tools

Assignment 11. Discharge wastewater with chemicals

Description

Waste water must not be discharged into the sewer. You dispose of wastewater that is contaminated with chemicals. You make sure that the wastewater can be disposed of correctly, given its composition. You take an indicative sample to determine which substances are in the waste water. You dispose of the substances in accordance with the applicable laws and regulations. Upon arrival of the waste at the processor, the processor will check by taking a sample. This is necessary to determine the final composition of the waste.

Preparation

You collect the waste water.

1. You determine the composition of the wastewater.

Check:

- √ Take an indicative sample or complete a pre-notification for the processor
- √ Processor accepts sample by providing waste stream number
- √ Determining the type of contamination

- √ Tools and materials
- √ Personal protective equipment

2. You determine the method of disposal based on the work plan and the manufacturer's instructions.

Check:

- √ Own safety
- √ Other people's safety
- √ Hazardous substances safety

Performance

You drain the waste water or have the waste water drained.

1. Dispose of waste water (or have it disposed of).

Check:

- √ You dispose of the waste water through a processor
- √ Environmental safety
- √ Accompanying documents

2. You follow the instructions and regulations.

Check:

- √ You work meticulously
- √ You work at a good pace

Completion

You tidy up the workplace.

1. You clean the materials and tools

Check:

- √ Cleaning materials and tools
- √ Cleaning PPE
- √ Storing materials and tools

Final assessment CTO

The last step to complete the practical skills is taking the final test.

In this test you show that you are capable of working as a CTO in practice.

You will discuss with your practical supervisor when you can take the final test.

On the day of the final test you will receive an assignment from the practical supervisor that you will carry out.

The practice supervisor and sometimes another assessor look at how you do this. They will assess your work on the following points:



Core task 1: Preparing for chemical cleaning activities			
1.1 Checking the requirements for safety and the environment	I	G	N
Performs a check with the intake form. <ul style="list-style-type: none"> • Determines when deviations must be reported • Asks for necessary information • Conveys a message concisely and clearly 			
Checks whether it is possible to work safely and environmentally consciously. <ul style="list-style-type: none"> • Points out the risks of unsafe situations to others • Checks own PPE • Keeps up to date with changes in the cleaning process 			
1.2 Planning own work	I	G	N
Plans the work. <ul style="list-style-type: none"> • Uses relevant information, such as instructions and work order • Organizes own work • Asks for necessary information 			
Ensures that materials and tools are collected. <ul style="list-style-type: none"> • Collects and interprets relevant information • Knows the possible uses of materials and resources • Signals deviations and reports this 			
1.3 Prepares installation and connection of the devices	I	G	N
Prepares the installation for use. <ul style="list-style-type: none"> • Works according to safety procedures regulations and work instructions • Connects tools correctly • Uses prescribed PPE 			
Checks the security of the location. <ul style="list-style-type: none"> • Identifies and reports an unsafe situation • Clearly indicates what is possible and what is not possible • Holds colleagues accountable 			
Core task 2: Carrying out chemical cleaning activities			
2.1 Performs cleaning work	I	G	N
Performs the cleaning work optimally. <ul style="list-style-type: none"> • Works meticulously and at a good pace • Checks the progress and results of the work process • Works in accordance with regulations for safety, working conditions and the environment 			
Uses materials and equipment correctly. <ul style="list-style-type: none"> • Works according to procedures and regulations • Calls colleagues to account for non-quality-conscious actions • Makes responsible use of the equipment 			
2.2 Checking and administering activities	I	G	N
Supervises the work. <ul style="list-style-type: none"> • Addresses others about unsafe and/or non-environmentally conscious behaviour • Monitors the progress of the execution of the work 			

<ul style="list-style-type: none"> Verifies that company and safety regulations are followed 			
<p>Manages the work.</p> <ul style="list-style-type: none"> Reports data and findings to those involved Provides clear, complete and relevant information Works accurately 			
2.3 Completion of work	I	G	N
<p>Cleans up the used materials and tools.</p> <ul style="list-style-type: none"> Cleans tools after use Checks whether tools are still functioning properly Checks if materials are not exhausted Safely stores materials and resources 			
2.4 Daily maintenance and remedying (minor) faults	I	G	N
<p>Fixes minor faults.</p> <ul style="list-style-type: none"> Checks the technical condition of the equipment Consults the manual Works according to procedures and regulations 			
<p>Performs daily equipment maintenance.</p> <ul style="list-style-type: none"> Checks the safety features on the equipment Runs through the checklist Plans basic minor maintenance 			
Core task 3: Functional leadership			
3.1 Provides instruction and guidance	I	G	N
<p>Instructs employees about the work to be performed.</p> <ul style="list-style-type: none"> Defines assignments for employees Involves employees in the organization of the work process Provides employees with the necessary information 			
<p>Supports employees at work.</p> <ul style="list-style-type: none"> Clearly states what is expected of employees Takes into account the qualities of employees when distributing the work Creates working conditions with optimally functioning employees 			
3.2 Checks and resolves issues	I	G	N
<p>Checks the work of employees.</p> <ul style="list-style-type: none"> Monitors the progress of the work and sets priorities Takes differences between employees into account when dealing with them Oversees the coherence between the parts of the work process 			
<p>Provides feedback on the outcome of checks.</p> <ul style="list-style-type: none"> Signals tensions and acts accordingly. Holds employees accountable for their responsibility Discusses problems and looks for solutions 			
<p>I: Insufficient G: Good N: Not observed</p>			
Total assessment final test: Pass / Fail*			

