



**TÜVRheinland®**  
**DIN CERTCO**

Genau. Richtig.



# Certification Scheme

## DIN-Geprüft Surface Treatment Inspector

in accordance with

**DIN EN ISO 12944**

(Edition: February 2020)

## Foreword

DIN CERTCO was founded in 1972 by DIN e.V. the German Institute of Standardization for the awarding of DIN marks and offers the certification of products and persons, services and enterprises on the basis of the DIN Standards and similar specifications.

To document our neutrality, independence and competence, we have an accreditation according to DIN EN ISO/IEC 17065. The satisfaction and trust of our customers and their data we ensure by the following certifications:

- Quality Management System according to DIN EN ISO 9001
- Environmental Management System according to DIN EN ISO 14001
- Information Security Management System according to DIN EN ISO/IEC 27001
- Occupational Health and Safety Management System according to OHSAS 18001

The person certifications carried out by DIN CERTCO take into account the general requirements for bodies operating certification of persons according to the international standard DIN EN ISO/IEC 17024.

Surface treatment inspector takes care of corrosion protection of steel structures (all structures made of steel, whole or in part) by protective paint or coating systems. To perform the profession of surface treatment inspector in a qualified manner, a corresponding training and specific knowledge and skills are required. The training and examination includes specific information with the focus on for example type of building, type of surface to be protected and surface preparation or ambient conditions and duration of protective systems are the basic of the person certification.

Certification is like a proof of qualifications being required to work as the "DIN-Geprüft Surface Treatment Inspector" by constructing and repair projects. This is a requirement for an inspector of corrosion protection to stamp his service and competence with the certification mark "DIN-Geprüft Surface Treatment Inspector". This certification mark assures that an independent, neutral and authority institution has carefully examined and reviewed all qualification criteria. In addition, the monitoring ensures that requirements of the certification scheme are continually met also during the validity period of the certificate. This certification is an additional value for investors being responsible for any service decision.

The certification mark "DIN-Geprüft Surface Treatment Inspector" can be used, if all requirements set in section 5 of this certification scheme in accordance with the described procedure have been met.

All certificate holders can be found on the homepage of DIN CERTCO ([www.dincertco.de](http://www.dincertco.de)), which is updated on a daily basis.

## Start of validity

This certification scheme is valid from 2020-02

## Changes

The next changes have been made comparing to the Certification Scheme "DIN-Geprüft Surface Treatment Inspector" (2019-01):

- a) Section 4.5.6 Re-Examination
- b) Editorial changes

**Earlier versions**

Certification Scheme "DIN-Geprüft Surface Treatment Inspector" (2019-01)  
Certification Scheme "DIN-Geprüft Surface Treatment Inspector" (2016-11)  
Certification Scheme "DIN-Geprüft Paint Inspector" (2015-11)  
Certification Scheme "DIN-Geprüft Paint Inspector" (2015-01)  
Certification Scheme "DIN-Geprüft Paint Inspector" (2014-05)  
Certification Scheme "DIN-Geprüft Paint Inspector" (2012-09)  
Certification Scheme "DIN-Geprüft Paint Inspector" (2006-12)

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## 1 Scope

This certification scheme sets down the DIN CERTCO certification procedure for surface treatment inspectors and, in conjunction with the assessment principles specified below, contains all the requirements for issuing the "DIN-Geprüft Surface Treatment Inspector" certification mark. Certification as an inspector of corrosion protection provides proof in the form of a certificate that the applicants hold the necessary fundamental knowledge and skills for the corrosion protection of steel structures using protective paints and coatings systems.

Participants in the certification process must provide proof of compliance with the specified requirements by an assessment to validate their expert knowledge and skills and keep their knowledge and skills over a long term through suitable procedures. The monitoring procedure ensures the compliance with these requirements over the long term.

## 2 Basis for testing and certification

The following documents constitute the basis for testing and certification. In the case of dated references, only the version referred to applies. In the case of undated references, the most up-to-date issue of the document referred to applies, including all changes.

DIN EN ISO 12944     Paints and varnishes - Corrosion protection of steel structures by protective paint systems

- Part 1 General introduction
- Part 2 Classification of environments
- Part 3 Design considerations
- Part 4 Types of surface and surface preparation
- Part 5 Protective paint systems
- Part 6 Laboratory performance test methods
- Part 7 Execution and supervision of paint work
- Part 8 Development of specifications for new work and maintenance
- Part 9 Offshore

Since 2018 the Norwegian Standard NS 476 is out of force. For that reason, the certification of surface treatment inspectors is performed in accordance with the qualification requirements specified in this certification scheme and in a close accordance with NS 476:2004 - Paints and coatings – Approval and certification of surface treatment inspectors.

- This certification scheme
- The General Terms and Conditions of Business of DIN CERTCO
- The related schedule of fees of DIN CERTCO

## 3 Requirements

Participants in the certification process must provide evidence of required qualifications, demonstrate their skills and abilities during an examination, and maintain their knowledge and skills in the long term through appropriate action. The monitoring process ensures the conformity with the defined requirements is also ensured in the long term.

The acquisition of special knowledge and skills in the field of surface treatment inspector usually takes place through a corresponding course. This course provides the knowledge required in Annex C, which the applicant must prove with the exam.

Recognized training partners of DIN CERTCO are available on the website of DIN CERTCO [www.dincertco.de](http://www.dincertco.de)

## 4 Certification procedure

### 4.1 General information

The certification process has a three-level structure and results in the award of the certificate "DIN-Geprüft Surface Treatment Inspector (Level A)", "DIN-Geprüft Surface Treatment Inspector (Level B)" or "DIN-Geprüft Surface Treatment Inspector (Level C)".

**Level A** Technical schooling or relevant work experience of 7 years

**Level B** As Level A, with additional evidence of at least two years' relevant full-time experience in the supervision of work (corrosion protection of steel structures).

**Level C** As Level A, with additional evidence of at least five years' relevant full-time experience in the supervision of work (corrosion protection of steel structures).

All candidates must pass an examination. The knowledge required in accordance with Annex C can be learned by attending a 10-day course or seminar (see section 4.3).

Recognized by DIN CERTCO training partners can be found on the website of DIN CERTCO updated on a daily basis.

### 4.2 Application

The certification process begins with a formal written application from the applicant (candidate) to DIN CERTCO, including the wished certification level. At the same time, the application acknowledges the testing and certification principles listed in section 2.

The applicant to DIN CERTCO in writing (preferably digital) must submit the following documents. See also section 4.3:

- Application for certification and with legally binding signature
- Copy of the diploma of job-related training
- Confirmation of participation in relevant qualifications

Upon receipt of the application, the applicant receives an order conformation from DIN CERTCO with a procedure number and instructions on the further course of the procedure and, if applicable, still missing application documents.

### 4.3 Evidence to be submitted

Participants in the certification procedure must provide proof of completion of professional schooling, preferably in a technical profession. Applicants without proof of technical schooling must have learned seven years' relevant practical experience.

When submitting an application for certification, applicants must provide proof that they meet the relevant requirements as follows, depending on the desired certification level:

- Copy of a certificate of professional education (Level A, B, C)
- Proof of qualifications of relevant courses (Level A, B, C)
- List of references/activity proofs of a two-year (Level B) or five-year (Level C) full-time experience in the field of "Monitoring of corrosion protection with coating systems in steel structures". Refer also to section 4.9.

The specific knowledge and skills relating to corrosion protection of steel structures by protective systems are usually learned by attending a suitable course. The course offers to the applicants an assistance regarding requirements set out in the annex, which have to be confirmed by examination.

The certificates of Level A or Level B been already issued can be changed to Level B or Level C upon an application by the certified inspector if corresponding evidence is submitted and positive evaluated by DIN CERTCO.

#### **4.4 Admission to the certification procedure**

DIN CERTCO verifies the application to determine whether the applicant can be admitted to the certification procedure. This includes a verification of all supporting evidence for completeness and validity.

DIN CERTCO informs the applicant in writing about the results of the verification for admission to the certification procedure. If the evaluation is positive, the applicant is admitted to the certification procedure (after providing any addition documents that may be required). The documents for the admission to the certification procedures must have been received at the certification body at least 14 days earlier to the examination.

If the application for the admission to the certification is rejected, the applicant will be informed in writing and the reasons will be given.

The admission to the certification procedure expires if:

- The applicant withdraws the application and informs DIN CERTCO in writing
- Facts afterward became known that would have caused the admission by refusing it, if they could be known before.

In both cases, the applicant must bear the costs of processing the application documents.

#### **4.5 Examination**

##### **4.5.1 General information**

The examination is a key part of the certification procedure. The examination refers to the series of measures used by DIN CERTCO to determine the extent to which a participant has the knowledge and skills required for certification.

All information relating to the examination process will be handled in confidence by the certification body and by its authorized representatives.

The examination is done in German language. If the recognized by DIN CERTCO training partner offers courses in one other language, the examination can be done in this language.

##### **4.5.2 Examination content and processing**

The examination includes a theoretical and a practical element (separate exams).

The theoretical part of the examination comprises questions from the areas specified in Annex C and must be completed in given examination time limit. No helps (training documents, literature, etc.) are permitted. The theoretical part covers the theoretical principles with a focus on the specific knowledge areas of the inspectors.



The practical part of the examination comprises some practical exercises (working with samples) during the applicant must perform and document the analyze specified in Annex C. The applicant may use the relevant standards as an assistance. The practical part covers the assay experience that may be required when working as an inspector.

#### **4.5.3 Evaluation of the examination results**

An expert appointed by DIN CERTCO evaluates both parts of the examination. To pass the whole examination, the applicant must correctly answer at least 50% of the total number of points in both parts of the examination. If the applicant obtains a score lower than 50% in either part of the examination, this part is classed as not passed.

Although the theoretical part of the assessment focuses on the specific content, it also contains questions relating to basic knowledge.

The score for each individual examination is either "passed" or "not passed".

The overall score for the examination is:

- "Passed" if the applicant passes all separate exams with "pass",
- "Not passed" if a score of "not passed" is given for one or both of the separate exams.

A score of "not passed" will be given if the candidate withdraws from the examination without a valid reason after the application and registration for the examination.

The reason for withdrawal or absence must be submitted to DIN CERTCO immediately in writing in credible form. A doctor's note must be provided in cases of illness.

If an applicant fails the examination, DIN CERTCO will usually provide notification in writing within three weeks of completion of the examination that he has "passed" or "not passed" the separate exam and been awarded an overall result of "not passed". No further information is provided about the examination results. The right to inspect the examination records is granted under the conditions set out in section 4.5.4.

If the participant passes the overall examination, a certificate will be issued as the final decision about certification.

Initial certification can be performed with repeating of an examination within a maximum period of 2 years from the date of the first examination. After this period, the process of an admission to the certification procedure must be repeated and the initial certification must be performed with full-scale examination. The certification body decides about any exceptions.

#### **4.5.4 Right to inspect of examination records**

An inspection of examination records may be performed only in person and only for the examination completed by the participant. The inspection may be performed only in the presence of a supervisor appointed by DIN CERTCO. During the inspection, it is not permissible to make any notes, drawings, etc. relating to the examination records. There is no claim to sample solutions or notification of individual solutions. The time allotted to inspect of the records is limited to 30 minutes. Any unclear points must be raised with the person assigned to supervise. These will be documented and sent to the company management, the head of the certification body or his representative for further handling and a decision.

Failure to comply with one or more of the above conditions or other behavior that prevents the inspection of records from going ahead as planned will result in the inspection being cancelled with immediate effect and the participant will be excluded from all future examinations conducted by DIN CERTCO.

These conditions must be signed by the participant prior to the inspection of examinations records and countersigned by the person assigned to supervise.

#### **4.5.5 Cheating. Breach of regulations**

If a participant of exam attempts to influence the results of the examination by cheating or using non-approved aids (in written or electronic form, e.g. training documents, literature, mobile phones, etc.), the examination in question will be graded as a "not passed". In serious cases, DIN CERTCO reserves the right to exclude the participant from sitting further examinations.

#### **4.5.6 Re-Examination**

If the examination for the certified coating inspector is rated as "failed", the participant can repeat the examination after submitting a written application. The application must be submitted to the certification body within six weeks of the examination result becoming known.

The repetition of the examination includes the individual part of the examination that was assessed as "failed". If the first repeat test is again assessed as "failed", a retake is still possible upon written request from the participant. The application must be made within six weeks.

If the second / further repeat test is not passed, the participant can register for a new test and, as recommended, for the preparatory course. The certification body decides on the scope of the further retest and on exceptions.

For the evaluation of the re-examination, the regulations apply as for a first examination.

### **4.6 Certificate and the right to use the certification mark**

Based on the assessment results, DIN CERTCO decides to award or not award the certificate. If a decision is taken about not to award the certificate, DIN CERTCO will notify the participant in writing.

In the case of a positive decision, DIN CERTCO issues the certificate with the date of the decision in the name of the participant and (if requested by the participant) the participant's address and/or company. DIN CERTCO signs the certificate and applies the seal of the certification body. It will usually be provided to the participant by post within six weeks of completion of the examination.

Upon issuing the certificate, DIN CERTCO assigns the right to use the mark "DIN-Geprüft Beschichtungsinspektor" (DIN-Geprüft Surface Treatment Inspector) in connection with a corresponding registration number.



Structure of the registration number:

- Surface Treatment Inspector Level A: **PZ-BIA-000**
- Surface Treatment Inspector Level B: **PZ-BIB-000**
- Surface Treatment Inspector Level C: **PZ-BIC-000**

With each issued certificate, an ID card will be issued and if requested a stamp (see example) with the title: DIN-Geprüft Surface Treatment Inspector. The certificate, the ID card and the stamp build together a documentation of the tested and certified qualification (Level A, Level B or Level C) of the inspectors for the corrosion protection.

The stamp looks like follows (German example):



The stamp same like the certificate and the ID card is the property of DIN CERTCO and is subject to the validity of the certification. If the certification is deleted, the stamp must be returned to DIN CERTCO free of charge.

For changes/ extensions such as employer change, change of certification levels as well as for duplicates a new stamp must be requested. For the issuance of the stamp, DIN CERTCO will charge a processing fee in accordance with the applicable fee schedule.

Terms of use:

- 1) The stamp is due to the registration number traceable to the certified surface treatment inspector. The stamp may only be used by the certified person and must be kept inaccessible to third parties.
- 2) The stamp may only be used for correspondence, in particular for reports in the field of activity as a DIN-Geprüft (DIN-certified) surface treatment inspector. Usage in other topics is not allowed.
- 3) The stamp is not a circular mark as for publicly appointed or state-approved experts, the e.g. be awarded by chambers. When using the stamp a comparison with these round stamps is to be avoided. Likewise, in the context of the stamp, it is necessary to avoid the impression of having an appointment or recognition as an expert of a chamber in this context.

- 4) The stamp remains the property of DIN CERTCO. In case of misuse as well termination of certification, the stamp must be returned to DIN CERTCO immediately and free of charge.

#### 4.7 Publications

DIN CERTCO maintains a list of certified inspectors keeps it up-to-date and makes it available to the public. All certificate holders can be viewed under <Certificate Holders> on the DIN CERTCO homepage at [www.dincertco.de](http://www.dincertco.de), updated on a daily basis.

#### 4.8 Validity

A certificate issued by DIN CERTCO in accordance with DIN EN ISO/IEC 17024 is valid for five years. After three years at the latest, DIN CERTCO will supervise the keep of certificate (see section 4.9). Before expiry of the certificate period, the validity of the certificate may be renewed for five years more on request of the certificate holder (see section 4.10).

Cancellation by the certificate holder must be submitted to DIN CERTCO by registered letter with a notice period of one month to the end of the calendar year. DIN CERTCO remains the sole owner of the certificate.

All personal data will be saved and processed in automated procedures according to Art. 6 GDPR (General Data Protection Regulation). The right to use this data for the purpose of advertising or market and opinion research can be revoked at any time.

#### 4.9 Surveillance

In order to keep the validity of the certificate during the runtime, the inspector has to verify for the first time after three years that his knowledge and skills are up-to-date and he performs regular activities as a paint/coating inspector. For this purpose, the inspector must submit at least the following proofs to DIN CERTCO:

- Written confirmation from the employer that the certificate holder has worked in the relevant sector over the previous time period or
- Written documents (e. g. expert reports) issued by the certificate holder in the role of paint/coating inspector or
- List of references of projects on which the certificate holder worked as a paint/coating inspector (reference list with details of the project description, location, area of responsibility or scope of tasks performed and if necessary, position description, period, etc.), letter of recommendation from clients, partners, etc. and
- Proof from the certificate holder about the participation in suitable courses, trade fairs, experience exchange groups, etc. in order to keep the expertise and to keep up-to-date with developments in the field of the corrosion protection of steel structures by protective paint and coating systems.

These must be submitted as a copy or confirmed by the employer. If the conditions for the keep of the certificate are not fulfilled, in terms of content or timely, the certificate loses its validity.

#### 4.10 Renewal

Before expiry of the period of five years, the validity of the certificate may be extended for five years more on request of the certificate holder if the prerequisites are met. By renewal,

the registration number of certificate is usually retained, with an exception that the qualification level should be changed as noted in section 4.3.

In case of renewal, the certificate holder has to submit to DIN CERTCO updated evidence of his practical experience, activities as paint/coating inspector, attendance of courses, etc. (see section 4.9).

Based on the proofs provided, DIN CERTCO assesses whether the paint/coating inspector has sufficient practical experience for a renewal of certificate and whether he has completed sufficient trainings to keep abreast of developments in the field of the corrosion protection of steel structures using protective systems over the past years.

DIN CERTCO keeps the right to carry out a verification of the competence of the certificate holder (e.g. by a written, oral or practical examination) in case of a renewal of certificate, if insufficient evidence is enclosed or the state of the technical progress in the field of corrosion protection is seriously altered (standards, laws, regulations, etc.), so that the re-examination is considered to be significant.

If these terms and conditions for the renewal of certificate are fulfilled in terms of content and before expiry, DIN CERTCO will extend the validity of the certificate for five years more. In addition, the certificate holder receives a written proof. The extended certificate is a matter to the same conditions of surveillance as the initial certificate.

#### **4.11 Suspension**

DIN CERTCO is entitled to suspend the certificate in justified cases for a limited period of time. The certificate holder will be informed in writing. During the suspension period, the certificate holder is not entitled to use the certificate, the ID card and if available the stamp or the mark and associated registration number.

#### **4.12 Expiry**

The certificate with the associated registration number expires with the date specified on the certificate if a renewal of certificate has not been submitted to DIN CERTCO before the validity of the certificate has expired. The certificate expires before expiration of regular validity if this certification scheme or supplementary documents are violated. The expiry of the certificate will be notified in writing. The certificate holder is not entitled anymore to use the certificate, the ID card and if available the stamp or the mark and associated registration number.

### **5 Obligation to provide information about changes**

The certificate holder is obliged to notify DIN CERTCO immediately of all significant changes concerning the certification (e.g. change of address, leaving the company). If the certificate holder violates this obligation, a standard administrative cost will be charged in accordance with the current schedule of fees.

If the certificate needs to be transferred, the prime employer has to agree the transfer during the validity of the certificate. DIN CERTCO must be provided with an application for amendments.

### **6 Special tests**

DIN CERTCO monitors the proper use of the certificate. When identifying incorrect use of a certificate, DIN CERTCO has to initiate the necessary (e.g. special test) immediately, furthermore if necessary, to take legal steps to remedy the complaint immediately. A special test can be carried out:

- in case of identified deficiencies,
- by the justified arrangement of DIN CERTCO, if DIN CERTCO assumes that a holder of the certificate does not or does not adequately meet the required quality requirements,
- upon request of third party, when a particular interest is maintained orderly market development with regard to competition and quality.

DIN CERTCO will determine the type and scope of a special test according to the purpose in each individual case.

## **7 Costs**

The costs for the certification are determined based on the currently valid schedule of fees of DIN CERTCO for the certification of surface treatment inspectors. The certificate does not become legally valid until the cost contributions have been paid. The certificate remains legally valid only as long as the current cost contributions are paid according to the current schedule of fees.

If a special test conducted by order of DIN CERTCO identifies shortcomings, the certificate holder must bear the costs of the special test. If no shortcomings are established during a special test performed at the request of a third party, the costs will be charged to the third party that submitted the request.

## **8 Liability/Complaints/Jurisdiction**

Liability/Complaints/Jurisdiction are detailed in the General Terms and Conditions of Business of DIN CERTCO.

## Annex A Responsibilities (normative)

A surface treatment inspector can professionally confirm whether performed corrosion protection work on steel structures according to the specification of the international standard DIN EN ISO 12944. Other tasks of the inspector can be determined by contract.

Based on his expert knowledge, a paint/coating inspector can make the following statements:

- **Equipment**  
The surface treatment inspector is able to confirm whether coating devices are suitable for the fixed work. During the corrosion protection work, the inspector must monitor the equipment used and keep corresponding records of them. The inspector shall also ensure that the equipment used is properly calibrated, adjusted and operated in accordance with the relevant standards and technical data sheets of the equipment manufactures.
- **Condition of steel**  
The surface treatment inspector can confirm whether irregularities in the surface, edges and welds have been treated in accordance with the specification.
- **Surface preparation**  
The surface treatment inspector can confirm whether the surfaces have met the specification immediately before coating.
- **Coating work**  
The surface treatment inspector can confirm whether the coating materials have been processed in accordance with the specification and the instructions of the manufacturer.
- **Climatic conditions**  
The surface treatment inspector is able to monitor and to log the climatic conditions (including local conditions and microclimate).
- **Environment, health and safety**  
The surface treatment inspector is familiar with the valid rules, regulations and directives on the environment, health and safety.
- **Documentation**  
During the corrosion protection work, the surface treatment inspector has to log all steps of the work. The reports must be done at fixed intervals. The form of these reports may depend on the requirements of the contract or the specification for the respective corrosion protection measure.

In the case of surface treatment preparation and coating work, the responsibility for quality lies, in general, solely with the contractor and not with surface treatment inspector. Furthermore, the manufacturer of the coating material is responsible for the quality of the coating material and the technical instructions for its use. The inspector may, in general, not make any expressions of opinion/declarations against other parties than the immediate contract partners at the various stages of the corrosion protection work in the contract or in the specification.

## Annex B Qualification requirements (normative)

### B 1 Test material/Equipment

### B 2 General information

Knowledge of the qualification requirements can be learned during a course or as self-study. The course usually includes a theoretical part based on recognized study material, as well as demonstrations and practical exercises.

### B 3 Areas of knowledge

The applicant must have knowledge in the following areas:

1. Materials and constructions
2. Corrosion
3. Surfaces and subgrades/substrates for paints and coatings
4. Environment conditions
5. Coating materials, paints and coatings
6. Requirements for execution of work
7. Standards, directives, work procedures and similar
8. Inspection work, duty of the inspector
9. Health, Environment, Safety
10. Offshore

These areas include content that can be divided into three groups:

- (S) Specifics
- (B) Basics
- (P) Peripheral

Specific contents (S) comprise knowledge, skills and attitudes essential to the inspector.

Basic contents (B) comprise knowledge, which all involved in surface treatments are expected to hold.

Peripheral knowledge (P) comprises related, parallel forms of surface treatment or protection by alternative materials.

The contents of the individual areas listed in Table B.1 are assigned to these groups.

**Table B.1 Content for which evidence must be provided in the individual areas**

MODULE	CONTENT	S	B	P	Remarks
<b>1. Materials and constructions</b>	Steel, low-alloy and unalloyed steels		X		
	Aluminium, zinc		X		
	Other metals and alloys		X		
	Manufacture, composition, important properties, terminology of materials			X	
	The importance of structural design with regard to anti-corrosive design		X		ISO 12944-3
	Welded and bolted connections		X		
<b>2. Corrosion</b>	Theory of corrosion	X	X		



MODULE	CONTENT	S	B	P	Remarks
	Terms of corrosion	X	X		ISO 8044
	Galvanic corrosion and bimetallic corrosion	X	X		ISO 8044
	Pitting corrosion	X			ISO 8044
	Crevice corrosion	X			ISO 8044
	Corrosion on steel re-bars in concrete	X			
	Various other corrosion forms		X		
	The galvanic series in sea water	X			
	Electrolytes, pH-scale	X			
	Basics of corrosion protection	X			
	Cathodic corrosion protection, sacrificial anodes, external current anodes	X	X		
	Classification of corrosive environments	X	X		ISO 12944-2 ISO 9223
	Corrosion protection by low relative humidity			X	
<b>3. Surfaces and sub-grades/substrates for paints and coatings</b>	Steel/metals, untreated and pretreated	X			
	Conditions before and after pretreatment	X	X		ISO 8501-1
	Methods of pretreatment	X			ISO 8504
	Evaluation of surface cleanliness, knowledge of degrees of purity, preparation grades		X		ISO 12944-4
	Water soluble substances	X			ISO 8502-6/9
	Dust	X			ISO 8502-3
	Condensation	X			ISO 8502-4
	Evaluation of surface roughness, knowledge of roughness grades	X			ISO 12944-4
	Shop primers (prefabrication primers)	X			
	Aluminium, thermally sprayed	X			
	Zinc, hot galvanisation and thermally sprayed	X			
	Stainless steel and other metals	X			
	Concrete reinforcing steel			X	
	Concrete	X			
<b>4. Environment conditions</b>	Measurement and calculation of the RW value and dew point	X	X		ISO 8502-4
	Use of the h-x diagram (formerly i-x diagram)	X			
	Controlling the climate, dehumidification, and ventilation	X			
	Temperature and humidity requirements during surface preparation, application and curing/drying of paints/coatings	X			
	Importance of the surface temperature during surface pretreatment and coating	X	X		
<b>5. Materials, paints and coatings</b>					
<b>5.1. Coating materials and paint systems</b>	Paints, organic and inorganic	X			
	Anti-fouling paints	X			
	Types of paints	X	X		ISO 12944-5
	Composition	X			
	Properties/mode of function	X			
	Thinners, solvents	X	X		
	Solids	X	X		
	Thickness	X	X		ISO 19840/2808
	Drying/curing process	X			

MODULE	CONTENT	S	B	P	Remarks
	Adhesion/cohesion	X			ISO 4624/2409
	Paint film defects during application and exposure	X			ISO 4628-1-6
	Calculation of material composition, "dead volume"	X			
	Application methods	X	X		
	Selection of paint systems	X			ISO 12944-5
	Knowledge of paint systems	X	X		ISO 12944-5
<b>5.2. Metallic coatings and coating materials</b>	Hot-dip galvanized steel, zinc and aluminium	X			
	Thermal spraying of zinc and aluminium	X			
	Electrolytically applied coatings			X	
	Thermally sprayed wear protection coatings			X	
	Knowledge about coating, structure, effect	X			
	Duplex systems	X			
<b>5.3. Coatings for passive fire protection</b>	Inorganic/organic coatings	X			
	Substrate requirements	X			
	Fire classes			X	
<b>5.4. Special paints and coatings</b>	Powder coating			X	DIN 55633
	Glass flake reinforced polyester, vinyl ester, epoxy	X			
	Paints and coatings for tank lining	X			
	Anti corrosion tapes			X	
	Rubber			X	
	Soft coatings, wax, greases			X	
<b>6. Requirements for execution of work</b>	Quality concept	X			
	Critical points during surface preparation and application	X			
	Control of execution and progress	X			ISO 12944-7
	Control of equipment	X			
	Storage	X			
<b>7. Standards, directives, work procedures, and similar</b>	Standards for surface treatment	X			
	Work instructions, directives	X	X		
	Process regulations	X	X		
<b>8. Inspection work, duty of the inspector</b>	Duties/responsibilities of the inspector	X			ISO 12944-7/8
	The function of the inspector	X			NS 476
	The different parties in a project	X			ISO 9001
	The behavior and attitude of the inspector	X			
	Verification of specified quality	X			
	Planning of inspections	X			
	Controls	X			
	Inspection logs, documentation	X			
	Use of measuring instruments	X			
	Reference surfaces	X			
	Control and calibration of measuring instruments	X			
	Criteria for acceptance/rejection	X			

MODULE	CONTENT	S	B	P	Remarks
	Documentation of control activity	X			
<b>9. Health, Environment, Safety</b>	Hazardous substances in surface treatment	X			
	Protection and protective equipment	X			
	Fire and explosion hazards	X			
	Legal regulations for the handling hazardous substances	X			
	Safety and product data sheets	X			
	Technical working conditions				
	Scaffolding		X		
	Overpressure equipment		X		
	Working in tanks/confined spaces		X		
	Noise and lighting		X		
Handling of waste, chemical waste					

## **Annex C Examination content (normative)**

### **C 1 General information**

If in the following definitions of the content of the examination, the wording "the candidate must be able to explain...." the candidate is expected to provide a reasonable comprehensive explanation.

If the phrase "the candidate must understand/know..." or "the candidate must be able to name..." a rather short answer to the question is expected.

### **C 2 Content of the examination**

#### **C 2.1 Materials and constructions**

The candidate must:

- know what the terms as low-alloy/unalloyed steel and high-alloy steel mean.
- know how the characteristics of steel change with temperature.
- be able to name some differences between cold-rolled and hot-rolled steels.
- be able to specify unsuitable constructions from the point of view of surface treatment.
- know the important properties of aluminum and zinc.
- know other metals.
- know typical areas for the application of concrete.

#### **C 2.2 Corrosion**

The candidate must:

- be able to explain the term corrosion and the factors that influence the corrosion rate.
- be able to explain the characteristic of the following types of corrosion: general corrosion, pitting corrosion, contact corrosion and crevice corrosion.
- know the terms erosion corrosion, cavitation corrosion, selective corrosion, stress corrosion cracking and microbiological corrosion.
- know the corrosion of concrete reinforcing steels.
- know the conditions that cause corrosion on aluminum and zinc.
- be able to identify and to describe the most important types of corrosion.
- be able to explain the term "electrochemical series of metals, e. g. in sea water" as well as the terms electrolyte, pH-value, anode and cathode.
- be able to explain the main principles of corrosion protection.
- be able to identify types of corrosion which can be avoided by paints and coatings.
- be able to explain the terms galvanic corrosion and bimetallic corrosion.
- be able to explain the principle of cathodic corrosion protection.
- be able to explain the use of anti-corrosion inhibitors.
- know how environment conditions are classified regarding corrosivity and in accordance with ISO 12944-2 respectively ISO 9223.
- be able to identify the complexity of the system corrosion.
- be able to explain the effect of chlorides in acid and/or alkaline environmental conditions.

### C 2.3 Surfaces and subgrades/substrates for paints and coatings

The candidate must:

- be able to explain how the steel surface must be prepared for surface treatment with regard to welds, sharp edges, cutting edges, impurities.
- be able to assess an untreated steel surface with respect to the grade of rust in accordance with ISO 8501-1.
- be able to explain the various methods for cleaning and pretreatment/preparation.
- be able to select the appropriate pretreatment/preparation for certain subgrades/substrates for a corresponding coating.
- be able to explain the important properties of conventional abrasives.
- be able to assess the suitability of blasting media.
- be able to explain the tests which demonstrate the contamination of blasting media.
- be able to explain how the surface cleanliness and surface roughness are to be measured and evaluated and how standards and measure instruments are to be used.
- be able to evaluate whether or not a surface with a primer production covering is suitable for a subsequent coating.
- know the properties of aluminum and zinc as subgrade/substrate for coatings.
- know the specific properties of thermally sprayed aluminum and thermally sprayed zinc as subgrade/substrate for coatings.
- know the properties of stainless steel as subgrade/substrate for coatings.
- know the available options of the corrosion protection of reinforcing steel for the repair of concrete.

### C 2.4 Environment conditions

The candidate must:

- be able to explain the relationship between air temperature and relative humidity, absolute moisture content and the dew point temperature.
- be able to identify and to classify the environmental conditions according to DIN EN ISO 12944-2 (ISO 9223).
- be able to explain the methods for improving the climatic conditions to enable pretreatment/preparation and/or the application of the coating material.
- be able to explain the requirements for temperature and relative humidity during pretreatment/preparation and the application of paintings and coatings.
- know the standard measuring instruments used for measuring environment conditions.

### C 2.5 Coating materials, paints and coatings

The candidate must:

- know the various coating materials used for corrosion protection.
- know some special coating materials, such as e.g. anti-fouling coatings, and similar.
- be able to specify the main components of coating materials and explain their functions.
- be able to explain the functions of the individual layers in a coating system.
- be able to explain the function of anti-corrosion pigments.
- be able to name the commonly used hardeners in two-component coating materials.
- be able to explain how different coatings protect against corrosion.
- be able to explain the differences between thinners and solvents and explain their use.
- be able to calculate the liquid content/content of volatile components from the data given in the product data sheets.
- be able to calculate the dry and wet layer thickness from the data given in the product data sheets.
- be able to explain the drying/curing behavior of different coating materials.
- be able to identify various types of coating materials by their drying/curing behavior or the use of solvents.

- be able to explain the terms of adhesion and cohesion and the reasons for adhesion and cohesion disorders.
- be able to identify and specify the usual defects in coatings.
- be able to explain the reasons for the usual defects in coatings which may occur during application and during drying/curing.
- know how such defects in the coating can be remedied and avoided.
- know the usual methods for the application of paintings and coatings and be able to explain their advantages and disadvantages.
- be able to explain how painting materials and painting systems, coating and coating materials are selected.
- be able to read and understand technical data sheets.
- be able to select coating systems for special exposures.
- be able to name the common methods used to test the durability of coatings.
- know the coatings used to protect against corrosion and be able to explain their main characteristics.
- know the most important coatings used for fire protection and know how these systems are constructed.
- know the applications in which special paintings or coatings are used.
- be able to calculate the composition of coating materials.

### **C 2.6 Requirements for execution of work**

The candidate must:

- be able to understand quality concepts.
- be able to specify important aspects to be taken into account when storing coatings and consumables.
- know the function of the devices for pretreatment/preparation and application.
- be able to indicate errors during pretreatment/preparation and application.
- be able to monitor work progress in accordance with an inspection plan.
- know the composition and properties of blasting media.

## C 2.7 Standards, directives, work procedures, and similar

The candidate must:

- know relevant international standards and directives relating to surface treatment and the selection of coating materials.
- be able to explain the differences between standards, directives and instructions.
- be able to organize inspection work based on current standards, directives and instructions.
- be able to draw up an instruction guide for his own inspection usage and document the inspection work.
- be able to identify the difference between the work performed and the instructions, technical data sheets and regulations.

## C 2.8 Inspection work, duty of the inspector

The candidate must:

- be able to explain the duties of a paint/coating inspector.
- be able to explain the different functions of a paint/coating inspector in a project.
- know the roles of the different parties in a project.
- show an adequate behavior to the function.
- know the ISO 9000 and ISO 9001 standards.
- be able to carry out inspections in accordance with the instructions, regulations and directives.
- know the important control points which must be monitored during the execution of the work.
- be able to use all relevant equipment and carry out the necessary checks and calibrations of measuring instruments.
- know the technical terminology.
- be able to evaluate thermally sprayed aluminum or zinc coatings with regard to their suitability for application of the coating.
- be able to evaluate hot-dip galvanized steel and aluminum with regard to their suitability for application of the coating.
- be able to write appropriate reports, e. g. about:
  - the daily progress of the work,
  - disputes and/or errors which have occurred during execution,
  - to document the progress of the project over a longer period of time.
- be able to read reports from other parties involved in a project and respond accordingly on the basis of these reports.
- be able to explain how reference surfaces are to be used.
- be able to draw up deviation reports and know how to handle with errors and deviations.

## C 2.9 Health, Environment, Safety

The candidate must:

- be able to identify the potential hazards associated with surface treatment operations.
- be able to explain acute and chronic health hazards which may be caused by solvents and thinners.
- know the usage of rules and regulations to avoid the pollution of the workplace and the work environment.
- know the principles of how substances and products are classified with regard to health and fire hazards.
- know and apply the importance of the regulations on safety at work, in particular for the ventilation and aeration requirements during coating.
- know the classification of substances with regard to the ordering as harmful to the health of reproductive organs, carcinogenic or inherited.

- know and apply the most important laws and regulations (for health, environment and safety) related to the work to be carried out.
- be able to understand and apply the safety data sheets for products.
- know which protective equipment must be used by performers and inspectors during the work.
- be able to explain the terms of the fire protection, such as "flame point", "lower and upper explosion limit", "ignition sources", and the identification of the various fire classes.
- know and apply the regulations on the handling of chemical waste.
- be able to explain the rules for the labelling of chemical products in general and know how coating materials are to be labelled with regard to health hazards and fire safety.