

CERTIFICATE



Following the completion of training provided by Pilz,
this certificate issued by TÜV NORD CERT to

Matheus Hagemann

certifies that the above named has achieved the qualification

CMSE[®] - Certified Machinery Safety Expert

which meets the requirements of the guideline for Certification of
Certified Machinery Safety Experts (CERT-P13VA101)

(Contents of Training and Examination overleaf)

Certificate No.: 44 506 21 027417 0268

Valid from: 2021-04-16

Valid until: 2025-04-16



A handwritten signature in black ink, appearing to read "M. Beyer".

Martina Beyer
Specialist Manager Personnel Certification

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PILZ
THE SPIRIT OF SAFETY

Contents of training and examination for the qualification Certified Machinery Safety Expert (CMSE®)

Module 1

- ▶ Fundamentals of Safety
- ▶ Introduction to safety legislation and standards
- ▶ Motivation for Safety
- ▶ Responsibilities of key players and duty holders

Module 2

- ▶ Machinery Safety Legislation
- ▶ Legislation requirements for the design, construction and maintenance of machinery and work equipment
- ▶ Conformity procedures for putting machinery on the market or placing into service
- ▶ Equipment and Workplace Regulations
- ▶ Occupational Health and Safety Regulation considerations in relation to machinery

Module 3

- ▶ Risk Assessment
 - Applicable definitions and terminology relevant to risk assessment
 - Analysis of different risk assessment methodologies
 - Risk assessment according to international standard ISO 12100 and best practice
 - Introduction to risk reduction following risk assessment completion

Module 4

- ▶ Mechanical Guarding
 - International standards requirements relevant to machine guarding
 - Guard definitions, types and application to reduce risk
- ▶ Safety Components
 - Analysis of safety components, requirements and application
 - Specification and usage, advantages and disadvantages
- ▶ Electrical Safety
 - Review of international standard IEC 60204-1
 - Safety of electrical, electronic and programmable electronic equipment
 - Safe use and maintenance of electrically powered machines

Module 5

- ▶ Functional Safety control systems specification, design and validation
 - ISO 13849 - Safety of machinery – Safety-related parts of control systems
 - IEC 62061 - Functional safety of electrical, electronic and programmable electronic control systems
- ▶ Functional Safety of Pressurised Fluid Systems
 - Pneumatic and Hydraulic System Safety Requirements
 - Pneumatic and Hydraulic Safety Control Systems
- ▶ Functional Safety Workshop with worked examples
 - Practical Examples of ISO 13849-1 circuits
 - Practical Examples of IEC 62061 circuits