



COMPONENT CRASH TEST SYSTEM

complexity made simple.

HuDe GmbH

Since 1981 HuDe stands for highest quality and best service. Either in coke oven machinery or in test and measurement technology HuDe is firmly established around the world. The products are developed and produced with special attention to best

performance, newest technology, adherence of schedules and customer satisfaction. Our project teams and partners are using leading technology in design, construction, manufacturing and support to provide the best client satisfaction.

Our Values

Our business philosophy is providing high-tech products made by outstanding people. To secure this target we permanently check and improve our processes and skills. Continuous training of our creative engineers is one of the key points of success.



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Component Crash Test System

The state of the art compact and customer-specific Component Crash Testsystem (CCTS) simulates dynamic crash tests, which are suitable for the area of component production and for series and quality monitoring.

A-pillars, B-pillars, C-pillars, shock-absorbers and any kind of automotive component can be clamped on the intended wall and prepared for the test.

The slide with different variants e.g. sledder or hammer, crashes with a max. weight of 1,000 kg and a max. speed of 65 km/h over an acceleration distance of only approx. 18 m. State of the art 3D force sensors measure the resulting impact forces.

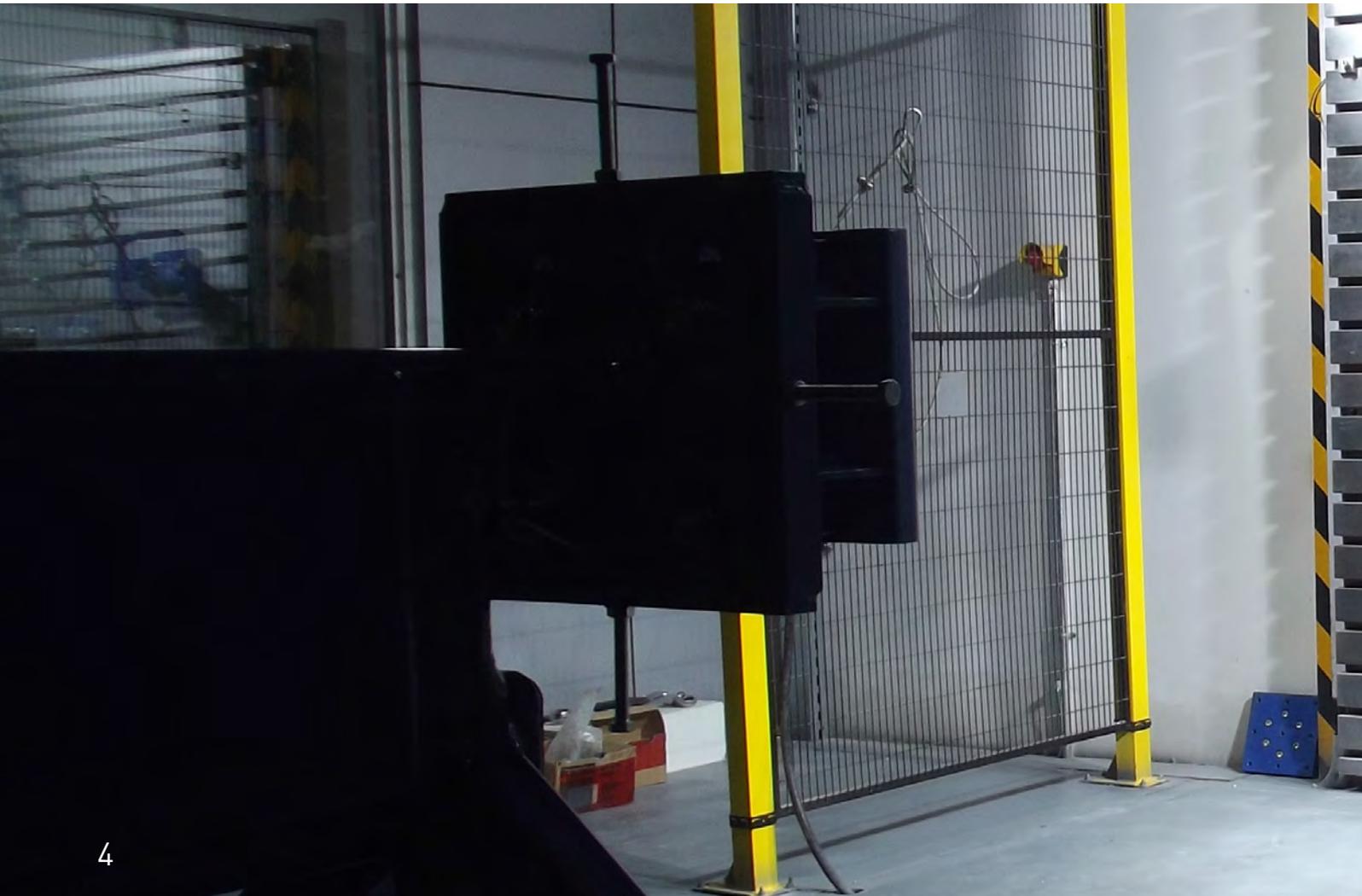
By correlating the structural deformation, the operator can draw rational conclusions about material, quality and construction.



Slide Variation

Different slides are available for the different test applications. The hammer is optimal for the investigation of punctual force effects and with the sledder can be larger collision flaps simulated.

If necessary, you will receive an individual slide according to your requirements.



Component Crash Test System



Crash Control System

The sophisticated acceleration system is highly relevant for compliance with the requirements.

By harmonizing the drive systems, controlled by the electrical system and the hydraulics, the performance of the system is regulated.

The clamping mechanism of the crash control system ensures a seamless motion.



Safety Concept

Operator safety is highest priority. With doorlocks, E-Stops, motion sensors, CCTV and access restrictions the maximum safety for operators is guaranteed.

Data security for test results of 15 years is optionally ensured by data transfer to central SQL servers or proprietary file systems according to customer specifications.



Force Sensors

The piezoelectric force sensor with integrated electronics is able to measure 3 orthogonal components F_x , F_y and F_z of dynamic forces in any direction.

It is predestinated for measuring high dynamic impact forces e.g. during crash test procedures for automotive R&D, where high dynamic longitudinal and shear forces have to be measured quickly, easily and very precisely. The sensor is made out of a heat treatable steel and provided with rust protection.

Technical Data

Measuring range

F_x - Direction: 0 - 500 kN

F_y - Direction: -100 - 100 kN

F_z - Direction: -100 - 100 kN

Temperature range: 0 - 40 °C

Protection class: IP 65

System Overview

With the compact and powerful system dynamic tests can be simulated with a high reproducibility. The maximum speed of the vehicle with the weight up to 1.000 kg can be reached at the point of impact. The resulting residual energy will be neutralized by the massive absorber system.

The result can be analyzed with velocity measurement, high-speed camera system and provided sensor technology.

Special Request

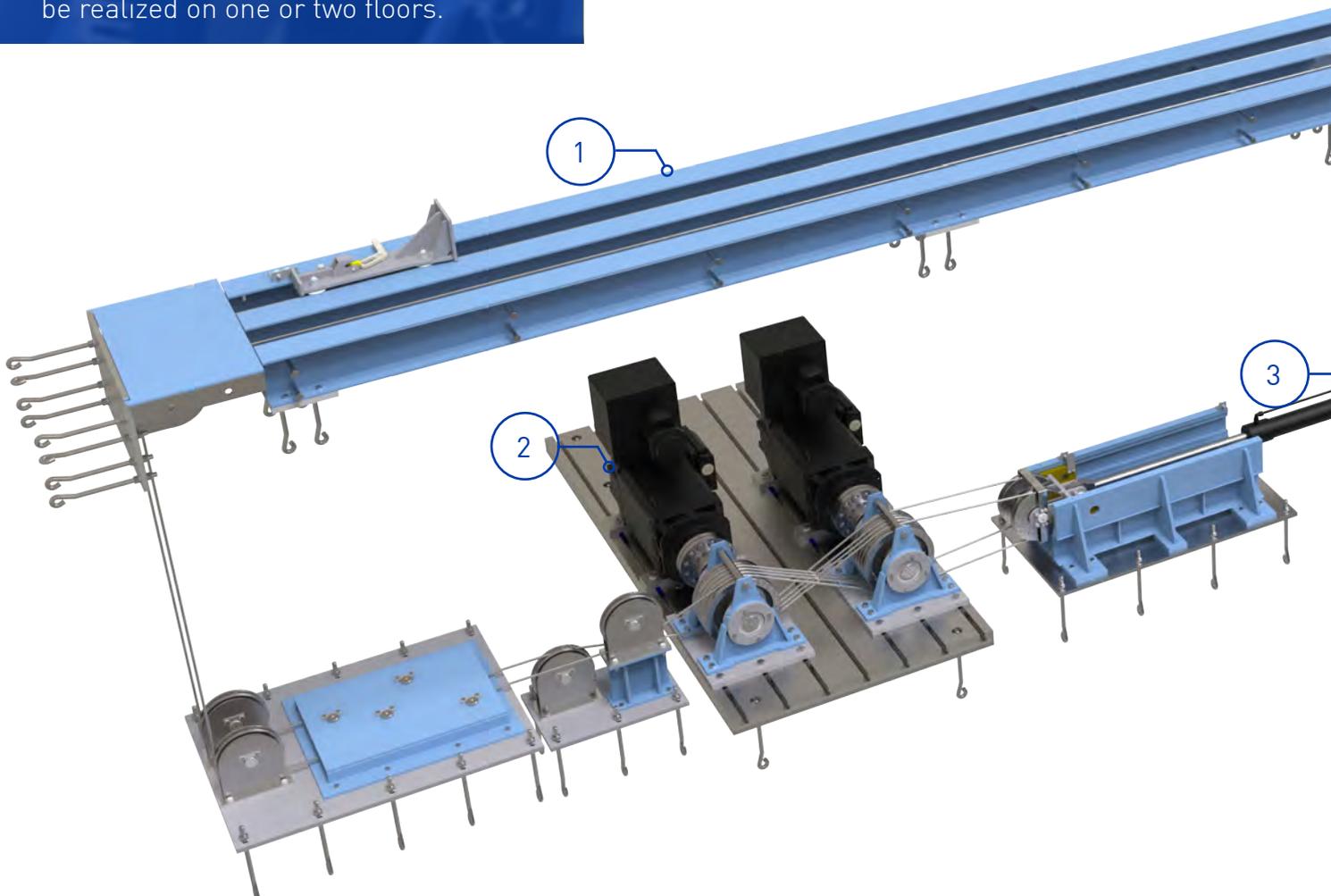
The realization is adapted according to your structural and environmental conditions. At high expenditure of customer civil works we are able to offer the variable arrangement of the system. For this purpose the CCTS can be realized on one or two floors.

Technical Data

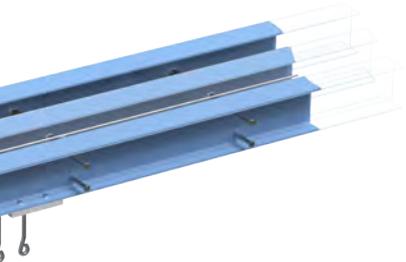
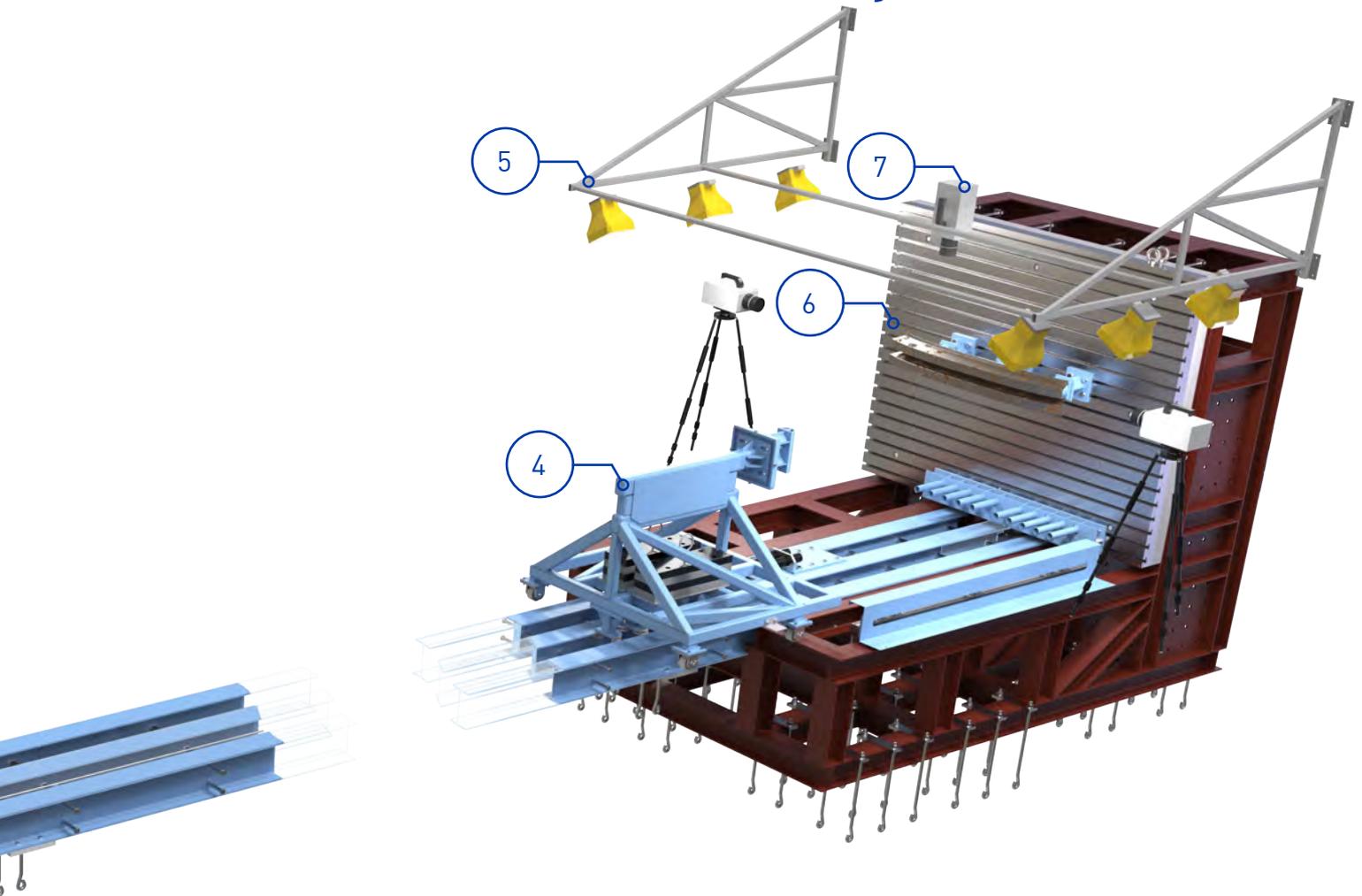
Max. Speed: approx. 65 km/h
Max. Acceleration: approx. 13.58 m/s²

Dimensions

Length of rails: approx. 22,000 mm
Acceleration track: approx. 18,000 mm
Crash Wall: 2,000 x 2,500 mm
Diameter of rope: Ø 14 mm
Length of rope: approx. 71,000 mm



System Overview



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1 RAILS
- 

2 MOTOR DRIVE SYSTEM
- 

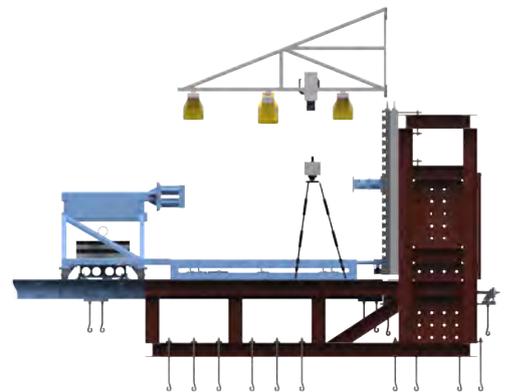
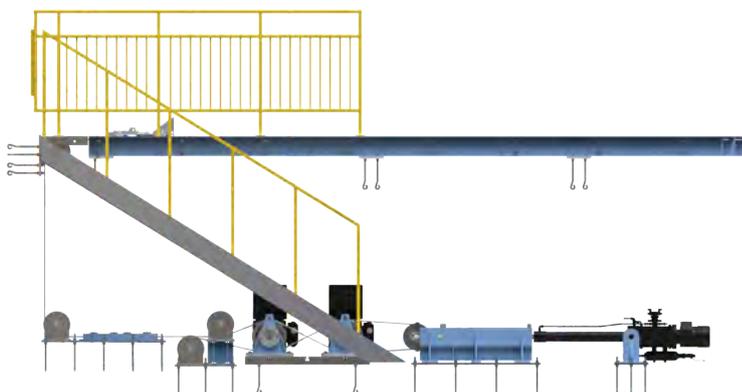
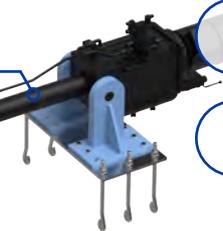
3 ROPE TENSION SYSTEM
- 

4 SLIDE
- 

5 LIGHTING SYSTEM
- 

6 CRASH BLOCK
- 

7 CAMERA SYSTEM



Testing Application

Software

HuDe CCTS - System status www.hude.com

Light system

4 5 6 Boost on test
1 2 3 BOOST DIM
ON OFF

Camera settings

Lock all doors

Charge Amplifiers

Test without light
 Test without measurement

Velocity: **25** km/h
Weight: **900** kg

Apply test values

Manual Trigger

Hydraulics
Pressure: **000.0 bar** e-stop

	Motor 1	Motor 2	
Speed:	0 0	0 0	rpm
Torque:	0 0	0 0	Nm
Current:	0.0 0.0	0.0 0.0	A

LOCAL Converter 1 Converter 2 Supply
System ON

Emergency stop pressed!

Abort test Reset e-stop System ON System OFF Error log

Dashboard



The structure and operation of the system is customized and shown at the user interface.

Results



All test results are collected only with one software and provided for analysis purposes.

Marker Tracker



Displacement and deformation are measured by a video analysis software with automatic Marker tracking.

Logfiles



Any kind of events and messages are stored in appropriate log files for quick solutions.

Customization



For upcoming and unexpected software test regulations the software could be easily customized.

Settings



The operation, control and settings of the light and video system is integrated in the HuDe software.

Features

Drive System

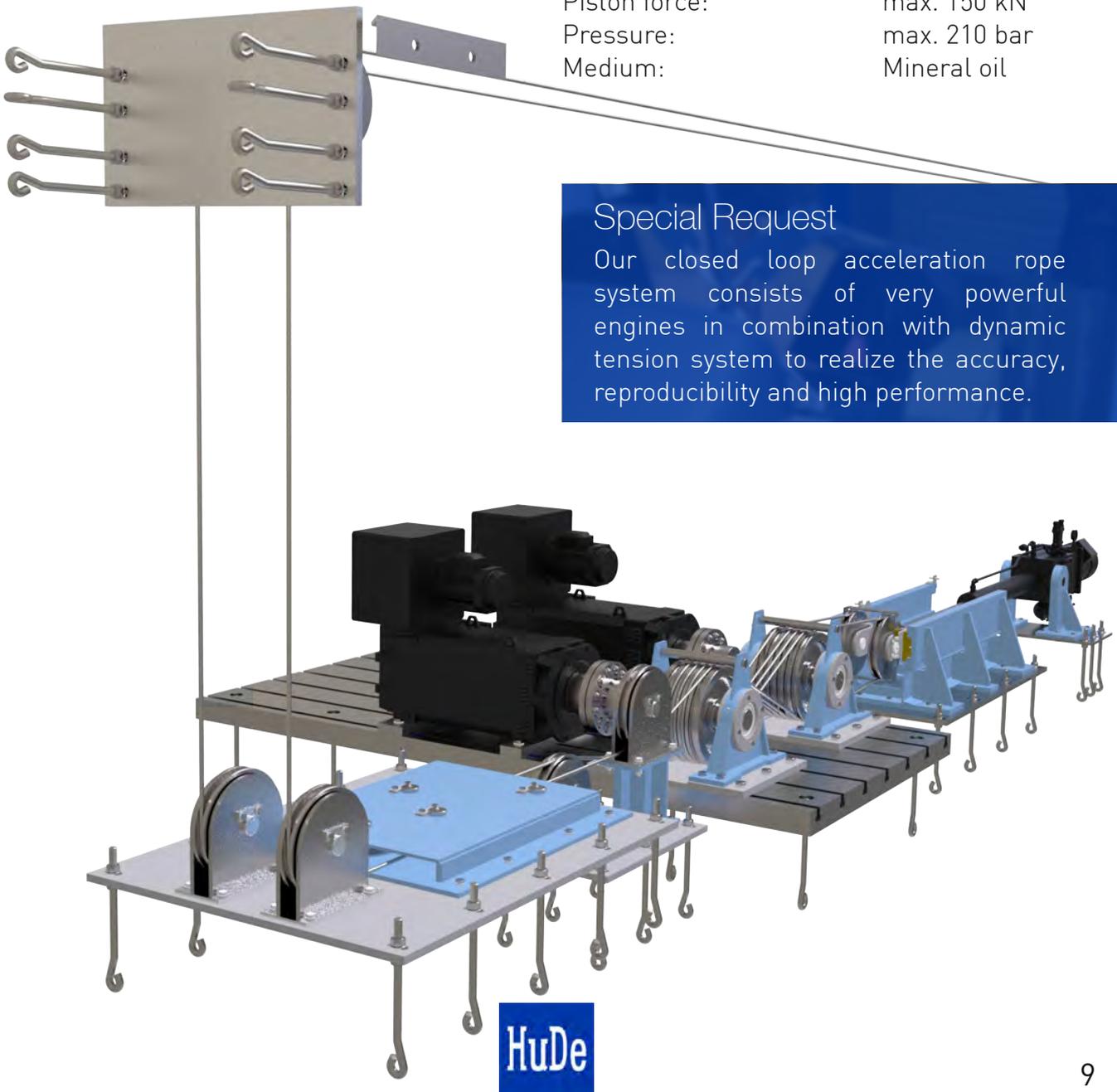
The two High dynamic performance asynchron motors accelerate the slide to the necessary impact speed of up to 65 km/h. The tension in the wire rope is ensured by an automatic and additionally manual hydraulic tension system. The wire rope is strongly loaded by the special interlacing. This increases the lifetime of the entire test system.

Technical specifications for each engine

Engine voltage:	400 V / 50 Hz
Engine Power:	137 kW, 248 A
Engine rotation:	1,000 min-1
Nominal torque:	1,307 Nm
Protection class:	IP 23

Technical specifications for tension system

Engine voltage:	400 V / 50 Hz
Piston force:	max. 150 kN
Pressure:	max. 210 bar
Medium:	Mineral oil



Special Request

Our closed loop acceleration rope system consists of very powerful engines in combination with dynamic tension system to realize the accuracy, reproducibility and high performance.

Testing Equipment



Control Cabins

From the operator's room, the entire system and the test procedure can be seen, so that any dynamic movement can be monitored by the operator.

The control takes place in the protected area.



Camera System

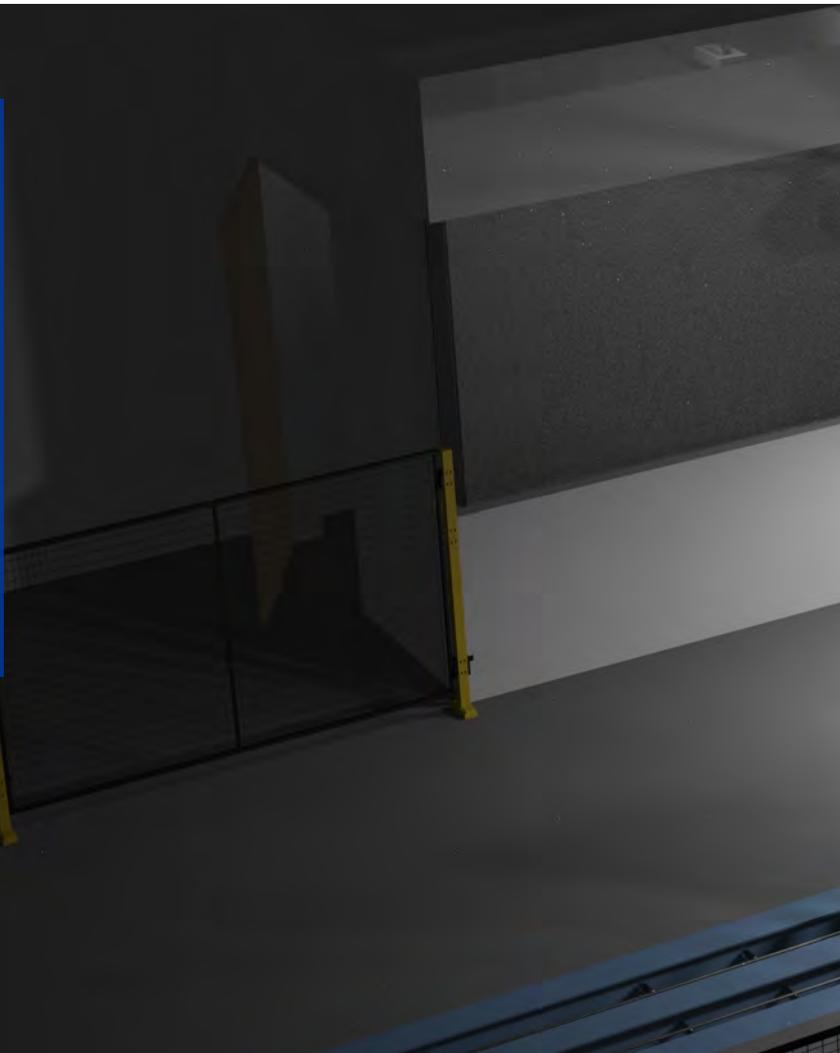
The impact is recorded with special high-speed cameras in combination with manual zoom lenses.

By arranging the high-speed cameras at different positions, the scenario can be viewed from different angles. The resulting images are used for video production and evaluation by Marker Tracker tool.

Extraordinary Service

In order to achieve worldwide service coverage, we work together with many different well known suppliers.

Despite the customer oriented system planning, standard components are mainly used to secure the procurement - even in different countries - without high construction costs. For a competent and quick reaction, our representatives are well trained and equipped.



Testing Equipment



Light System

In order to achieve the best image quality of the high-speed cameras, a lighting system is absolutely necessary.

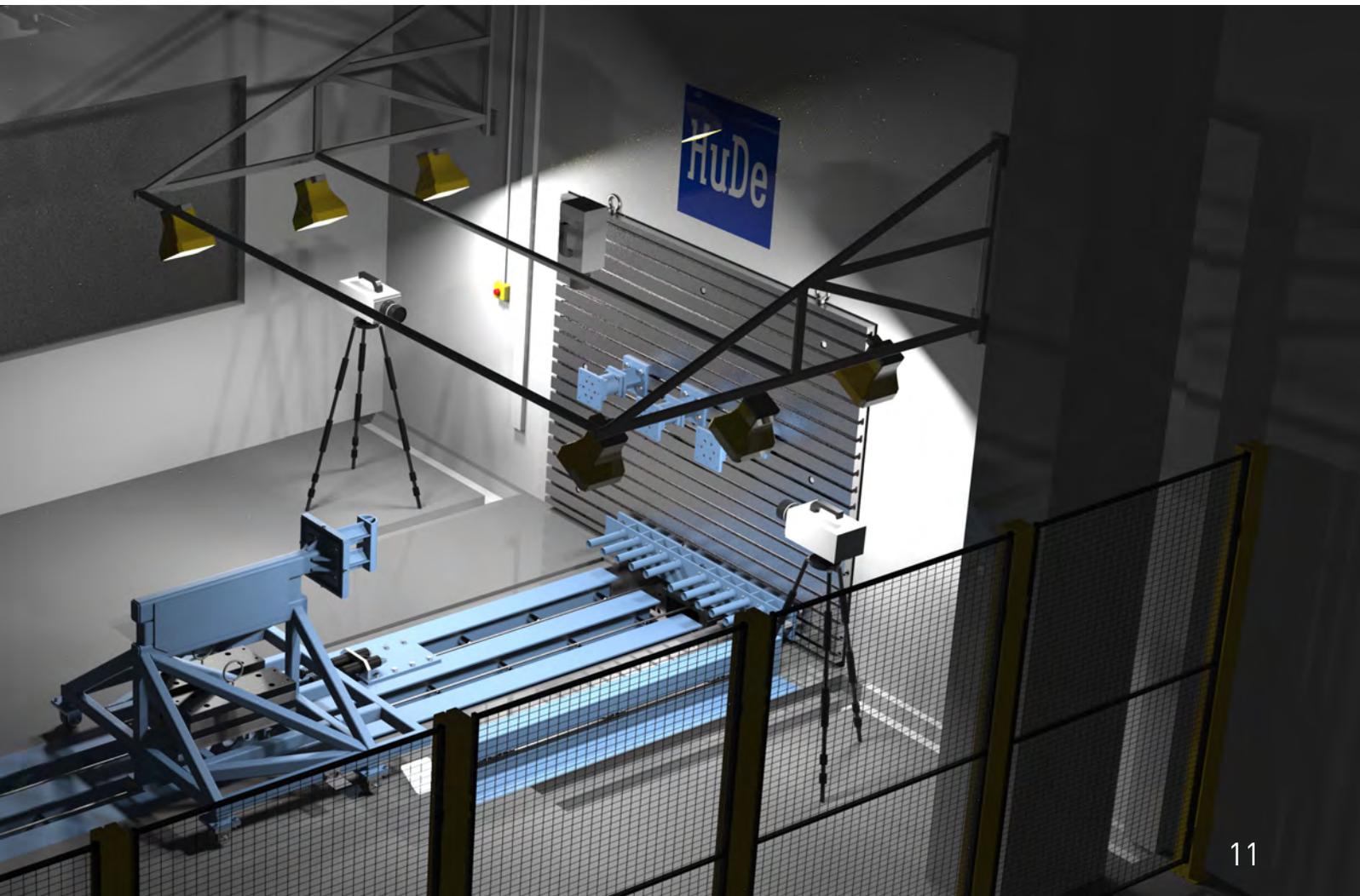
The integration of different lighting technologies (LED, HMI, Halogen) ensures sufficient illumination of the impact area. The ceiling mounted lighting system is arranged that no shadows can be seen in pictures.

With the turn-key HuDe complete solution via a Compact Crash Test System, various test methods can be carried out and developed. The simplified concept concludes a simple one man operation of the CCTS. Maintenance, service and preparation time is manageable with low effort, so that the handling of the entire system is extremely economical.

The test components are designed with a safety factor, that contributes to an extended life and a cost-effective test environment.

All coordinated mechanics, electrics and hydraulics ensure a high level of accuracy through the use of the software.

The test execution is automated, which leads the ensurance of a high level reproducibility.



HuDe

HuDe Mission Statement

We have realized projects in more than 25 countries and are represented around the world in all major regions of automotive development and manufacturing. Contact us today and convince yourself of our service and extensive project experience. Customer satisfaction and product quality are always our top priority.



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