

“How a QM-System may help to increase safety during storage, sorting or processing”

Eda Coskun, September 2017

Introduction Redux

- battery recycling company
- founding in 1997
- since 2016, 100% subcompany of Saubermacher Dienstleistungs AG
- 3 sites
- 80 employees in Germany
- in depth knowledge over 20 years of experiences
- offering customized services and solutions
- unique – and patent recycling facility

Coverage of the entire battery recycling portfolio:

- core business - household batteries:

 sorting

 dismantling

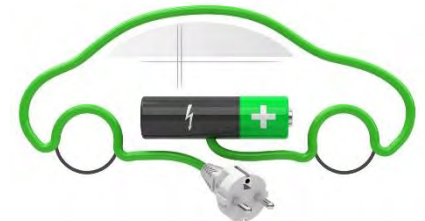
 recycling

- 2nd segment Li-ion batteries - e-mobility, e-bikes and other mobile devices:

 discharging

 dismantling

 recycling



In our locations in Germany Offenbach & Bremerhaven:

- storage and sorting
Mixed Batteries
- recycling of
AlMn-, ZnC-, and NiMh batteries
- storage, discharge and dismantling of
Li-ion batteries



“**How** a QM-system may help to increase safety during storage, sorting or **processing**”

What is a Quality Management System?

- main purpose is to increase customer satisfaction through the deliverance of quality products and services
- another purpose of QMS is to protect all areas of the business, including: facilities, employees, services etc.
- suitable for all sizes and types of organizations
- it is suitable for organizations in all industry sectors
- helps to improve management processes to compete locally and/or globally



What is a Safety Management System?

- ▲ managing business activities and applying principles, framework, processes to prevent accidents, injuries and to minimise other risks
- ▲ systematic approach to managing safety, including organizational structures, accountabilities, policies and procedures
- ▲ can be tailored to the size and complexity of the organizations

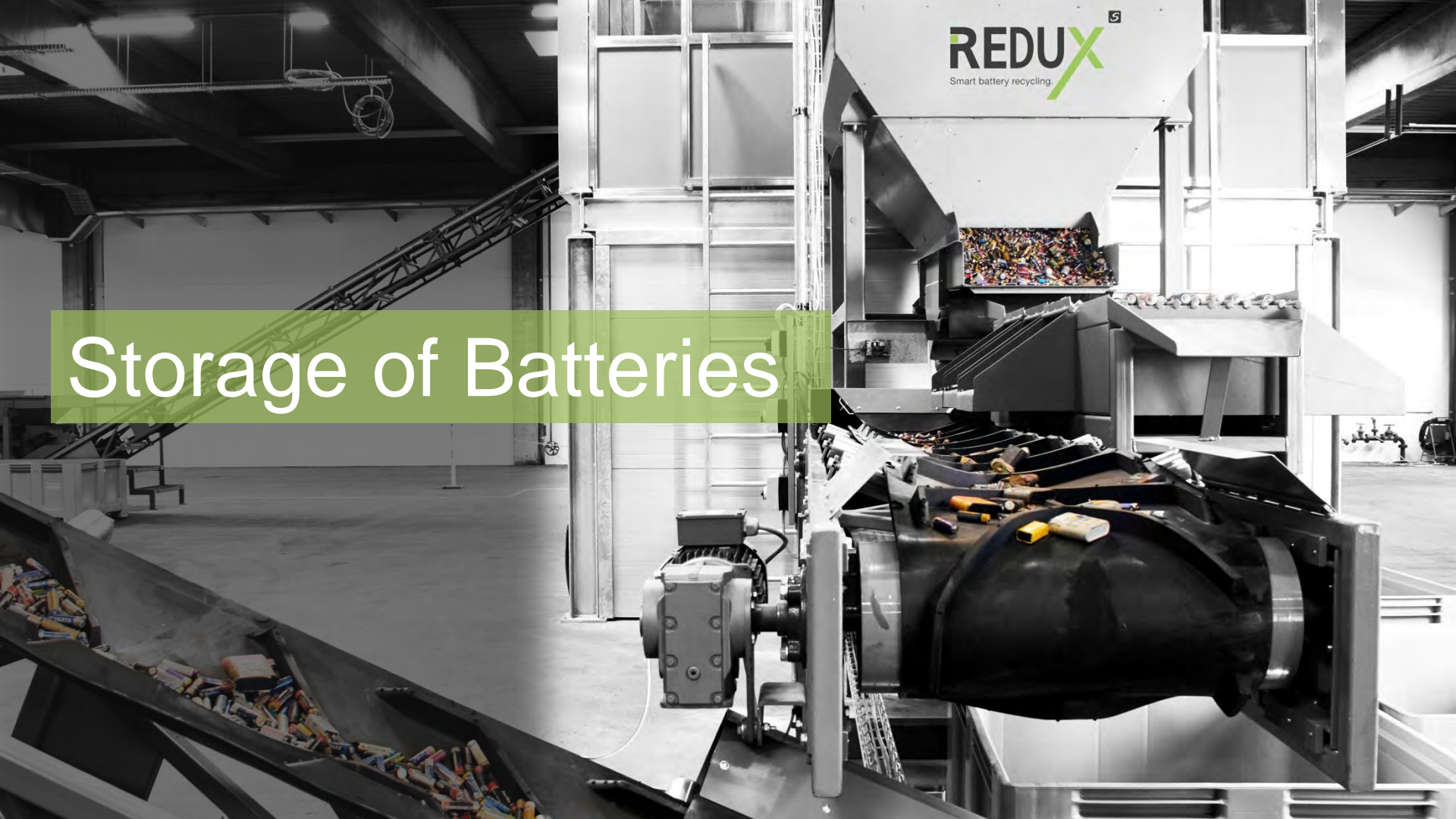
The primary targets of quality and safety:

- improve core processes, their inputs and outputs, and the identification of environmental aspects
- ensure that legal requirements* are complied
- awareness of ensuring competency of employees
- support processes, such as document control, record control, and internal/external auditing



* *EU Seveso Directive (BImSchG), EU Battery Directive (Battery Law), Industrial Safety Act (ArbSchG), ADR (e.g. transport of dangerous goods), Waste Framework Directive (Law on Life-Cycle), etc.*

Storage of Batteries



- trained employees in use of (used)-batteries and dealing with hazardous materials
- detailed instructions for each step of processes
- delivered batteries are decant immediately in collection containers
- every container is labelled and is recorded with date, input material and number in our system
- we have defined areas where we are allowed to storage batteries
- prompt processing of batteries, controlled by our logistic department
- batteries we do not recycle were sent as soon as possible to end recycler

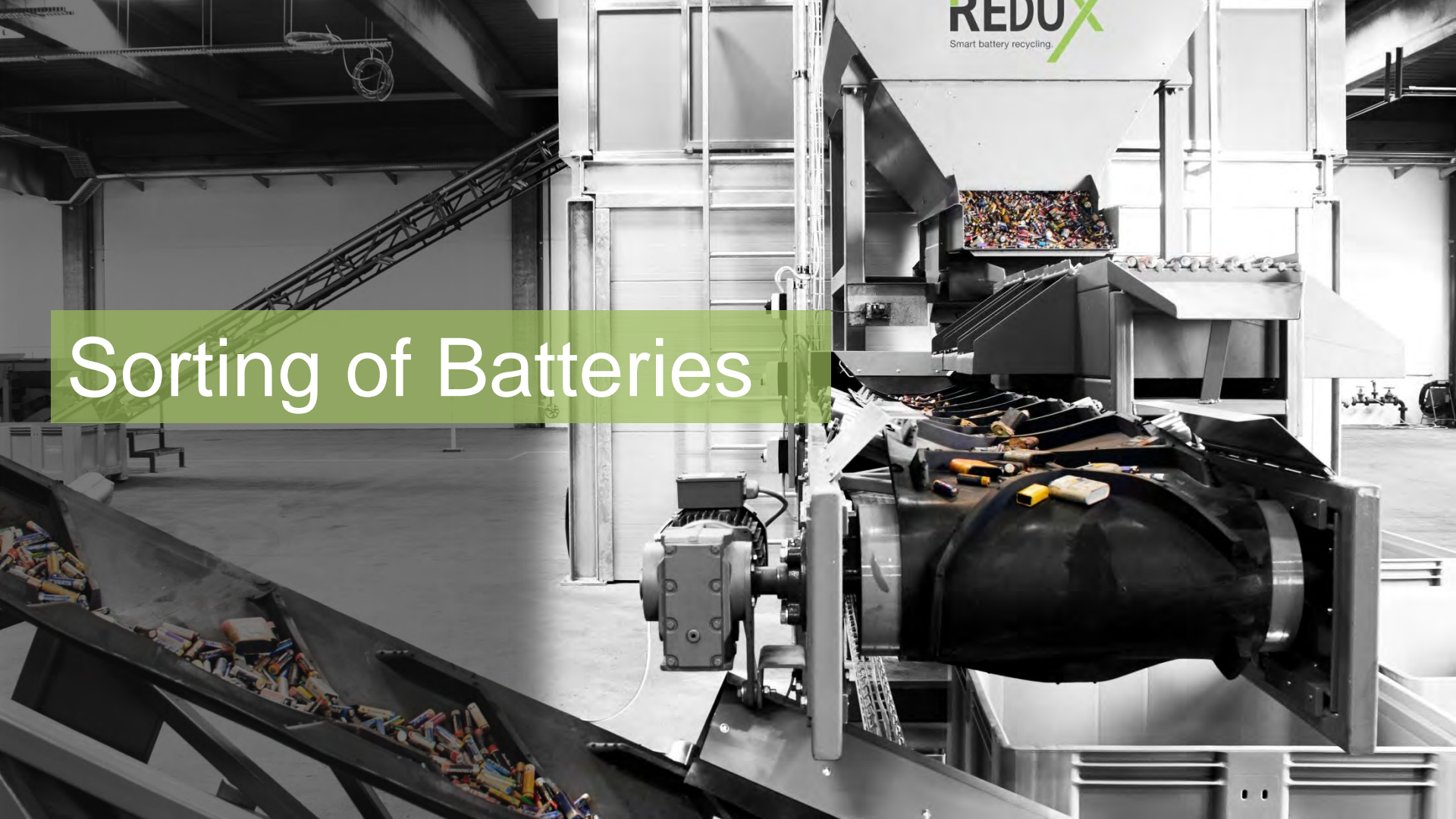




To prevent fire:

- 40 foot container for defect li-batteries
- li-batteries, which are sorted out are placed in drums and filled with sand or vermiculite
- fire walls in storage hall
- fire-extinguisher
- 24 hour guard with a thermal imaging camera

Sorting of Batteries



Sorting

Rough Sorting



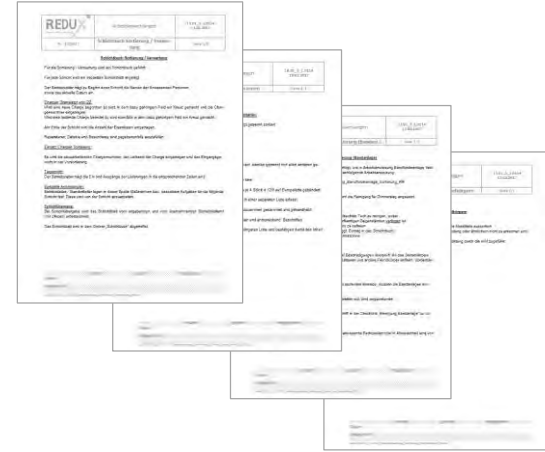
Fine Sorting



Size Sorting/
Screening



- employees are trained (at least half year) before sorting batteries
- trained employees to use the machines
- work instructions are frequently reviewed by internal and external auditors and communicated to our employees
- for better traceability → screening and sorting is followed by date and signature of employees
- frequently (biweekly) controls of sorted batteries to guarantee sorting accuracy



Schichtbuch Redux Recycling, Offenbach

Mitarbeiter: Datum:

Einheit	Charge Nr.	Charge Nr.	Charge Nr.	Charge Nr.

Mitarbeiter Band 1 Charge:

Mitarbeiter Verantwortung Charge:

el. Filteranlagen

Defekt/Strafungen

Beobachten

Eingangs

Ausgangs

Spezielle Anweisungen

Übergang Überd. Veranlassung Verwertung

Überschicht Schicht
Überwache Überwache Überwache

- to ensure the concentration of employees, every hour a break between 10-15 minutes
- regular talks with our employees e.g. issues, wishes, ideas etc.
- individual conversations about future plans e.g. training, experiences etc.
- ergonomically sitting position, heated and air conditioned working places
- eye wash bottles with instruction
- injuries (also smaller) are documented in the first-aid book to plan e.g. improvements



Processing of Batteries

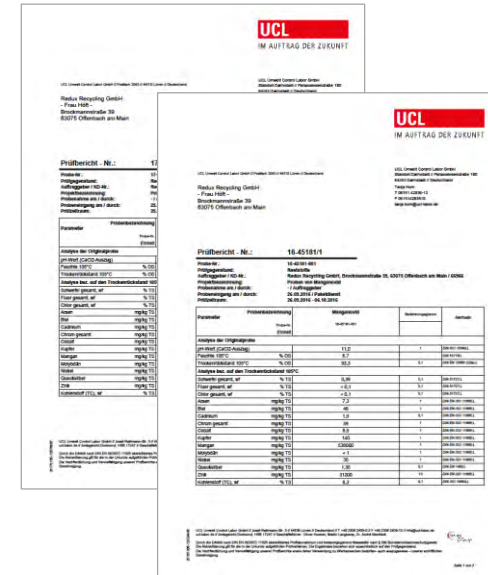


- inputs and outputs are registered in our operating log for complete traceability
- trained employees to use the machines and lift trucks
- li-ion batteries: high-voltage training before discharging and dismantling
- minimum 2 employees while discharging li-ion batteries
- manuals are based of external hazard analysis
- work and safety instructions are frequently reviewed and communicated to our employees



Processing

- dust measurement
- external company doctor
- medical check up at least every 3 months
- exhaust air system is controlled by signing the tally sheets, half hourly in order that toxins can not spread
- analysis of chemical substances before transport
 - every 10th black mass
 - minimum 15 analysis of MnO
 - every ZnO



Processing

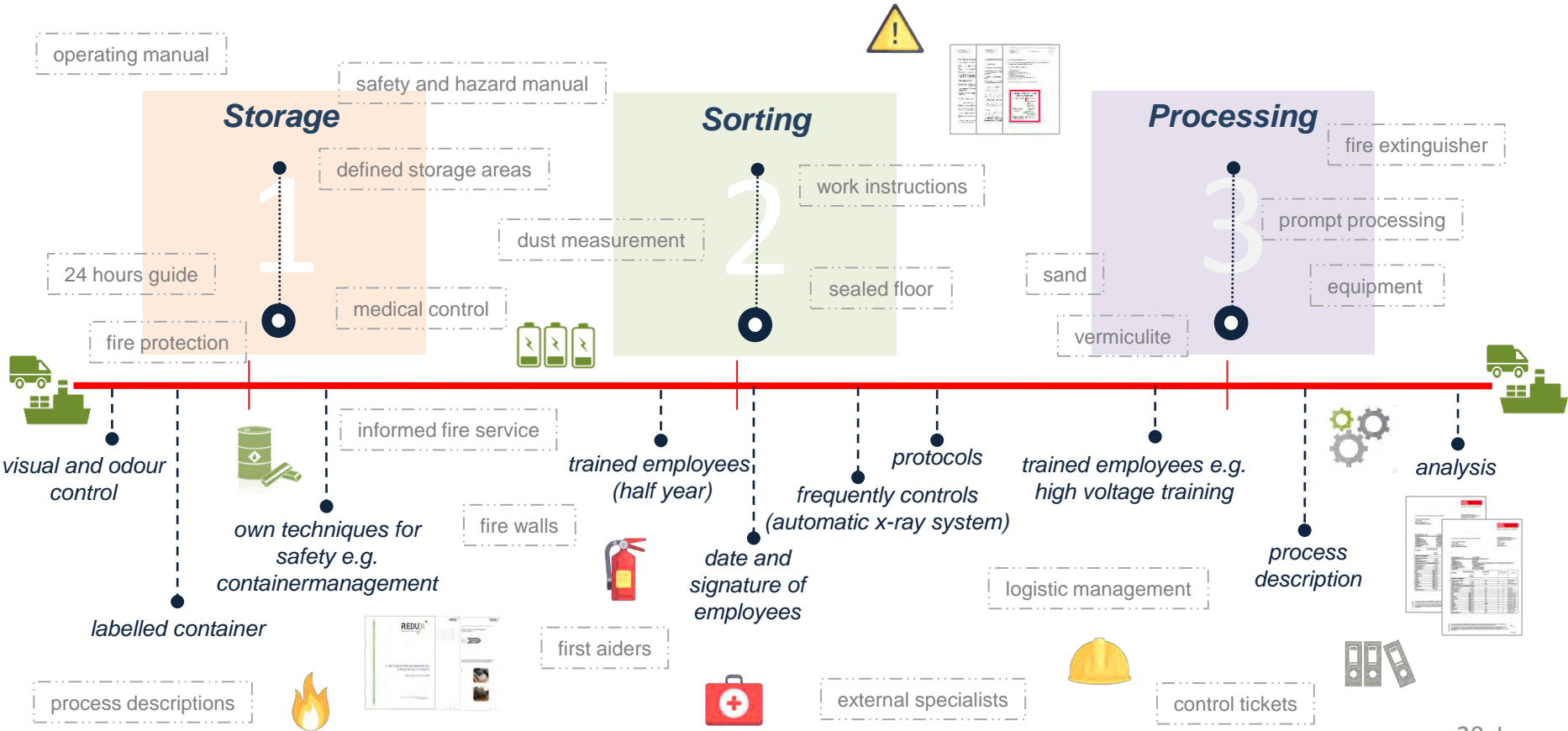
- sealed floor
- external specialist for safety, waste protection, etc.
- fire protection concept created by fire service
- employees are continuously being trained as fire protection assistants
- escape and rescue routes are labelled
- sand, vermiculite and fire-extinguisher
- periodic maintenance by internal employees

Prüf-/Messmittel Überwachungsplan OF

Anlage / Monat	1	2	3	4	5	6	7	8	9	10	11	12
Prüfmittel												
1. Prüfmittel												
2. Prüfmittel												
3. Prüfmittel												
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11. Prüfmittel												
12. Prüfmittel												

1 = geplante Vorführung 0 = durchgeführte Vorführung
 1 = Vorführung, Ex-Erchein, Prüfung, Konformität, UN/ADR, TÜV-TÜT

Importance of QMS for Safety



- operating, safety & hazard manuals, process descriptions, control tickets and checklists to ensure quality and safety
- every step from the storage till processing is defined
- documents are frequently reviewed and communicated to our employees
- security systems and practices are in place to prevent fire
- emergency plan frequently communicate to our employees
- first aiders in every shift and first aid-kit with a documentation sheet
- equipment for various workplaces
- trained 24 hour guard with a thermal imaging camera
- fire service is informed how to handle with battery fire

- requirements for a QMS closely match the requirements for a SMS
- same tools and processes you use to manage quality also apply to safety management systems
- documentation and document control, maintaining records, managing training, etc.
- risks and changes on the workplaces are always assessed by internal and external auditors
- obviously is a QMS a good base for safety but not sufficient



THANK YOU!