

Educating young people about working safely with chemicals

Database information

Country: Germany

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The **sectors covered** in this case study are the education sector and the chemicals industry, more precisely manufacturing of basic chemicals, fertilizers and nitrogen compounds, plastics and synthetic rubber in primary forms and education.

Task covered: handling chemicals in laboratories

Worker groups covered (vulnerable groups): young workers

The **purpose of the good practice example** is awareness raising of chemical risks at work among pupils and to ensure they are trained in safe working practices.

The **target groups** are pupils, young workers, trainees.

1 Initiator/organisations involved

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2 Description of the case

2.1 Introduction/background

Lehmann&Voss&Co. is a chemical company founded in 1894 in Hamburg, Germany. It has developed from a trading company to a diversified organisation combining three business models in Europe, Asia and the United States: trading, distribution and production. In 2016, the international Lehmann&Voss&Co. group had 569 employees in total, 364 of them in Hamburg. Lehmann&Voss&Co. focuses on the production of customer-specific product modifications for the plastics and rubber industries.

The company follows the global guidelines of the Initiative for Responsible Care (RC) ⁽¹⁾, and has incorporated them as a key component of its safety and environmental policy for many years. Internal RC guidelines must be followed by all workers. Furthermore, Lehmann&Voss&Co.'s safety at work management system was evaluated as exemplary by the competent authority, the Hamburg Office for Occupational Safety ⁽²⁾, in September 2013.

Providing workers with knowledge, skills and training in all aspects of safety and health at work is important to the company to ensure their protection: well-trained workers are safe workers. The education of young people in the safe production of plastics and the safe handling of chemicals is an area of concern at Lehmann&Voss&Co. Young workers in the plastics manufacturing industry may be exposed to various dangerous substances, including allergens and irritants. Therefore, it is important to

⁽¹⁾ <http://www.cefic.org/Responsible-Care/>

⁽²⁾ <http://www.hamburg.de/ausgezeichnete-betriebe/>

integrate occupational safety and health (OSH) issues into their training and education as early as possible. Negative outcomes resulting from a poor working environment are known to be more frequent among young workers, and work involving risk affects them more. According to some studies, workers under 25 years of age are also known to be exposed to carcinogenic substances more than any other workers (EU-OSHA, 2007).

In 2009, Lehmann&Voss&Co. started to cooperate with a school (first Stadtteilschule Poppenbüttel, then Stadtteilschule Eidelstedt) to train young people in the safe handling of chemicals and to introduce them to working life.

Wolfgang Reithmeier, a chemistry teacher at the district school in Eidelstedt, Hamburg (and formerly a chemistry teacher at the district school in Poppenbüttel), had been looking for an opportunity for cooperation with the chemicals industry. OSH experiences from the industry are also relevant for chemistry lessons and training school pupils.

His starting point was the following three key questions:

- How can pupils get an insight into scientific and technical professions?
- What is important for employers other than school marks?
- Why is OSH such an important issue in the chemicals industry?

2.2 Aims

The aims of Lehmann&Voss&Co. were:

- to achieve sustainably healthy workplaces for young workers;
- to improve the safety and health culture in the company;
- to present Lehmann&Voss&Co. as an attractive, competent and safe company;
- to promote the issue of OSH among young people;
- to attract future candidates (for training, internships, theses, employment) and to get closer to target groups.

The aims of the school were:

- to introduce young people to the world of work;
- to raise awareness about OSH;
- to increase the OSH competence of young pupils;
- to ensure safe and healthy work in the laboratory at school.

2.3 What was done and how?

2.3.1 Cooperation with the school

The teacher contacted the company in the context of his teaching module 'Nothing works without plastics' ('Ohne Kunststoffe geht es nicht').

Mr Reithmeier and Dr Heiko Thoms from Lehmann&Voss&Co. developed a concept for OSH training at the school and at the company for pupils aged 14 to 17. The training was to start in the school year in which most pupils turn 14.

First, a PowerPoint presentation provides pupils with information about the manufacture of chemicals and Lehmann&Voss&Co. (Figure 1), and then a questionnaire about OSH issues has to be filled in by the pupils.

Figure 1: Slide from the presentation: code of behaviour in school laboratories.

Verhaltensregeln im Schul-Labor

Wie verhalte ich mich richtig beim Umgang mit Gefahrstoffen:

- Immer aufmerksam sein!
- Bewusst handeln und gehen! **Warum?**
- Gebote und Verbote beachten und Vorgegebene Schutzausrüstung tragen:
 - Kittel **Nennt Sicherheitseinrichtungen im Chemie-Fachraum!**
 - Schutzbrille
 - Schutzhandschuhe
- Nicht rauchen / essen / trinken **Warum?**
- Sicherheitsinformationen zu Stoffen/Gemischen anschauen und beachten! **Wo zu finden?**
- Auf Beschilderung achten, z.B.

- Gefahrstoffe richtig entsorgen!

Lehmann&Voss&Co.

Figure 2: Pupils learning basic rules for using a Bunsen burner.



Figure 3: Pupils giving presentations as part of the project.



A lot of time is dedicated to OSH during chemistry lessons. Pupils learn basic rules of safety and health in laboratories and get a licence to use a Bunsen burner (Figure 2). Following that, they learn about the properties of substances as well as the Globally Harmonised System (GHS) hazard labels and pictograms. This is done by showing the relevant Napo video and by Dr Thoms, who passes on knowledge about relevant OSH issues in the working environment, especially in the chemicals industry.

2.3.2 Training at the company

In addition, the pupils gain practical experience at Lehmann&Voss&Co. through practical training at the company in the 8th grade and the 10th grade, when they are around 14 and 16. OSH is a key issue addressed in the practical training.

The training starts with information about the different types of plastics, their properties and the versatility of materials, not only theoretically but also practically. Subsequently, the pupils give presentations they have prepared at school beforehand (e.g. about the process chain in plastics production, the role of flame retardants in plastics or safety aspects when processing plastics) (Figure 3).

Figure 4: Discussion in small groups.



Figure 5: Laboratory work in small groups.



The pupils discuss OSH issues in small groups and receive special training in chemicals management and machinery (Figure 4). To enhance their safety awareness, the pupils must deal with safety instructions and prevention measures and integrate them into their protocols. 'One could say that OSH is becoming a ritual in the experimental lessons,' says Mr Reithmeier.

After the training, the pupils visit the company's production facilities in small groups (of three to six) and, since 2017, they have had the opportunity to manufacture plastic materials (such as foils) in a pilot plant (Figure 5). The pupils learn, through practical experience, details about the production and handling of chemicals and safety considerations when handling chemicals.

All pupils must wear personal protective equipment, and they are supervised and instructed on technical and organisational prevention measures throughout the visit.

2.4 What was achieved?

From the point of view of the school, the project has been a great success: 'The cooperation with Lehmann&Voss&Co. is an absolute win for us,' says Mr Reithmeier. 'It is a unique opportunity for the pupils to learn about the chemistry of plastics not only theoretically, but also practically. They get to know a real workplace and learn at site the importance of OSH. It's always a lot of fun for everyone and it's career oriented.'

It is obvious that the project has raised pupils' awareness of OSH, but it has also raised teachers' awareness, and they teach now this topic with greater enthusiasm. The pupils take their safety and health a lot more seriously. Pupils who care about the safety and health of their classmates feel important and proud.

For Lehmann&Voss&Co., it has also been a great success. The practical training increases pupils' interest in the chemicals industry. Pupils gain an impression of real work and are well informed about OSH when they apply for jobs. Starting OSH training early improved the OSH culture of the company.

An award-winning approach

The project was entered into several competitions and won several awards:

- runner-up in the Hamburg Industry School Award (Schulpreis der Hamburger Wirtschaft) in 2010;
- participation in the Hamburg Industry School Award in 2012;
- participation in the Responsible Care Award 2014, awarded by the VCI (the German Chemical Industry Association);
- nomination for the German Occupational Safety and Health Award (Deutscher Arbeitsschutzpreis) 2013 (Figure 6).

Figure 6: Certificate for the German Occupational Safety and Health Award 2013.



2.5 Problems faced

At the beginning, the organisation and planning of the school project was very time consuming for the company and the school. Both were unsure if the effort would result in a successful cooperation and project. After the first round of the project in 2010, however, it was clear that it was a great success both for the cooperation partners and, especially, for the pupils. Since then, the topics and content covered by the project have been further developed by both sides.

2.6 Success factors and challenges

Cooperation between industry and an educational establishment

The close cooperation between the company and the schools and the commitment of the experts on both sides has clearly been a factor in the success of the project.

Combining training with workplace experience

The combination of theoretical and practical information and addressing OSH issues in real workplaces led to a better and more sustainable understanding of OSH.

Involvement of all actors

Workers' representatives, managers, heads of division and work councils were involved in the implementation phase of the training programme. Feedback from all users was obtained through questionnaires and in group discussions during rollout.

2.7 Transferability

The project is transferable to other schools, industries and countries.

2.8 Further information

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3 References and resources

EU-OSHA (European Agency for Safety and Health), 2007, *Young workers — Facts and figures*, ed. E. Schneider. Available at: <https://osha.europa.eu/en/publications/reports/7606507>

Wikipedia, 2017, 'Adaptive learning', page edited on 24 May 2017. Available at: https://en.wikipedia.org/wiki/Adaptive_learning