

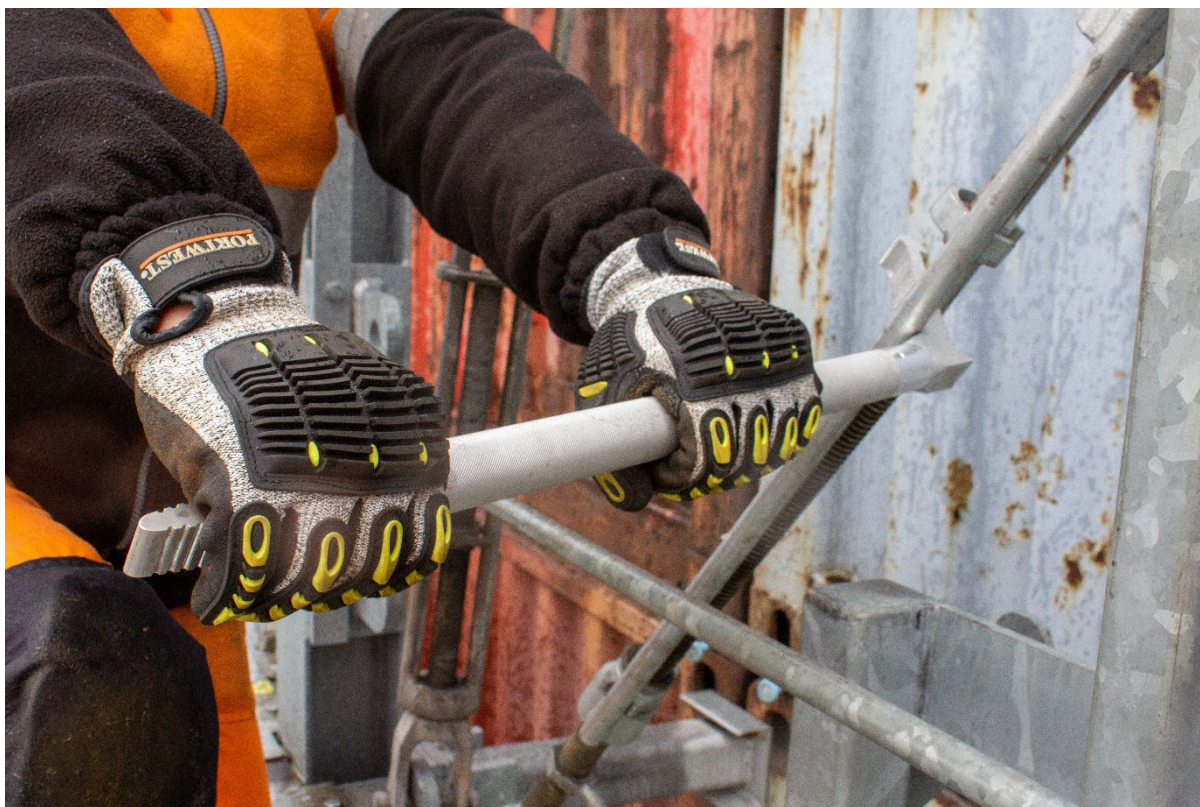
CEPA CV – LASHING TOOL

an ergonomic lashing tool, training package and safety gloves

protecting lashers from injury

the challenge

Container lashing on board is a physically intense and demanding task. Handling the heavy lashing bars and turnbuckles in sometimes suboptimal conditions due to the environment (such as the vessel itself), weather (e.g. frost), can lead to exertional injuries if not performed ergonomically. Data shows that container lashers have the highest frequency of exertional injuries among the Antwerp docker pool, with some experiencing long-lasting effects. Among lashers, we have observed a higher absenteeism, lower retention rates and a higher reskilling rate. Additionally, lashers encounter high safety risks while performing their job, such as hand injuries.



To address the issues above, this question was raised: how can exertional injuries be reduced under current working conditions, and how can safety be improved? Although providing a safe and healthy workplace is a joint effort of the terminal operator and the carrier. Significant transformation within the vessel construction industry is needed before all challenges can be addressed. Furthermore, employers (i.e., terminal operators) have limited influence over physical working conditions aboard vessels. In this context, we have assumed that container

lashers will continue manipulating the existing lashing gear in the current work environment. Therefore, our goal was to provide direct support to the lashers.



the innovation

The Port Work Innovation Hub is an initiative of Cewa to enable innovative solutions for a safe and healthy working environment in the port of Antwerp. Within this framework, Cewa, the unions and the University of Antwerp initiated a study on exertional injuries among lashers caused by container lashing.

The project began by mapping the lashers' working conditions. A test station replicating the onboard lashing platform was constructed at training centre OCHA, in order to simulate the working conditions as realistically as possible. The University of Antwerp departments of physiotherapy and ergonomics studied the lashers' body postures, movements, and the strength needed during container lashing. Video data were used to create a digital model, to measure the strength needed and the physical strain on the body, to identify risk areas.

Multiple lashers participated, providing representative data and essential input on working conditions on board.

In collaboration with University of Antwerp ergonomists and physiotherapists; and a test group of lashers, an ergonomic approach of (un)lashing was developed and translated into a training program and learning modules in a digital learning platform.

Simultaneously, a team of University of Antwerp product developers designed a lashing tool that supports the ergonomic working method. Guided by the digital model's findings and feedback from dockworkers by examining different existing tools, such as simple steel bars, they mapped the different types of lashing systems and incorporated in their design the usability across various turnbuckles. In their research, they included the need to reduce the risk of slipping, losing control of the tool, etc. Several prototypes were tested at the OCHA test station and in the field.

A group of lashers was then trained in ergonomic work methods, including warm-up before and cooldown after work. They tested the most promising prototype of the tool and provided feedback for final development. This testing had a specific scope: the ergonomic impact of the tool on the testers, the durability of the tool in the field and the cultural acceptance among the target audience. The lashers were asked for regular feedback and input. This output was combined in a final design.

In a complementary project, the use and design of specialized work safety gloves were investigated, as the risk of finger pinching during lashing remains above average. In collaboration with different manufacturers of safety gloves, innovations were implemented and after repeated testing, a range of impact-reducing gloves was developed. Different types of gloves were introduced to suit varying weather and work conditions, and comfort needs.

Overall, the innovation resulted in:

- an ergonomic lashing tool
- an ergonomic based training package
- new safety gloves, with an added requirement for mandatory use



how it was implemented

Three spectrums were defined: ergonomics (warm up, working and cool down), lashing tool, and hand & finger injuries caused by impact.

Impact-reducing gloves have been introduced into the work gear assortment and made mandatory for all lashing activities. Awareness campaigns supported this initiative.

The lashing tool was distributed to all container lashers in the port of Antwerp, as an individual tool. Each lasher received a box containing the tool, a manual, a link to an instructional video on Dockwise (Cepa's e-learning platform) and an exercise tool to strengthen their upper body, grip, and wrists. The tool was also added to the work gear assortment.

All lashers will follow a specific training (one full day) on how to lash and unlash ergonomically and how to use the tool. To promote ergonomic behaviour, such as stretching and warming up, an awareness video featuring two famous Belgian actors was created.

result

The ergonomic working method, combined with the lashing tool, reduces exertional stress on the body. The tool stimulates ergonomic movements. The effect on exertional injuries can only be measured on the long term, but preliminary results from a six-month questionnaire among the test group already show a significant positive impact. Since the introduction of the impact-reducing gloves and their mandatory use for lashers, there has been an almost 50% reduction in hand & finger injuries.

conclusion

A scientifically supported study and the involvement of executing employers, unions, and workers has shown significant results and provided a well-supported solution. The insight that there is not a "single" solution to the problem. Instead, the combination of technical (tool), organizational/training (ergonomic work method) and PPE innovations offers a multi-angle successful approach and product.

Users guide and instruction video on: <https://nextlevelcontainerlashing.com/>

LINK: <https://www.cepa.be/>

