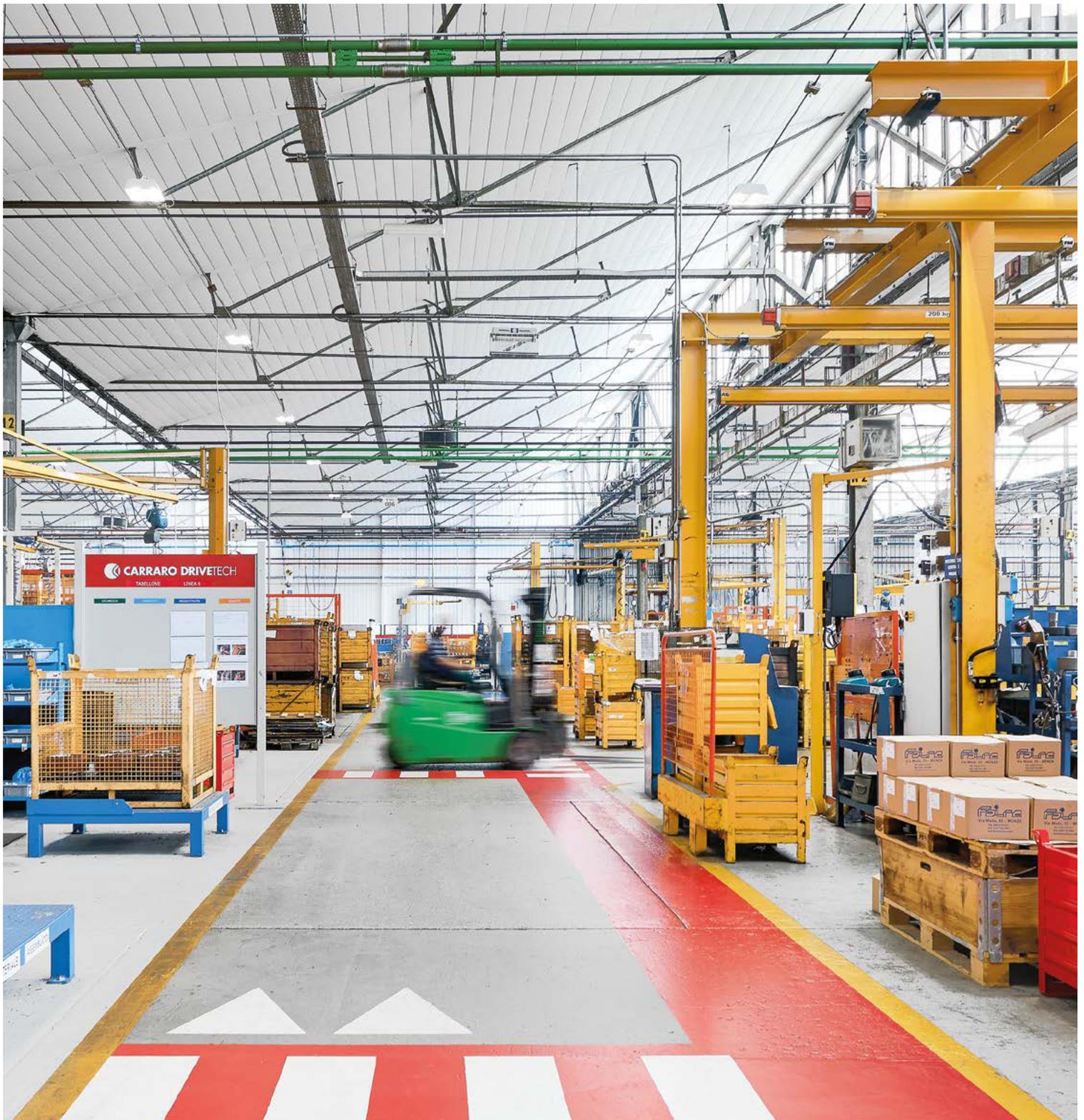
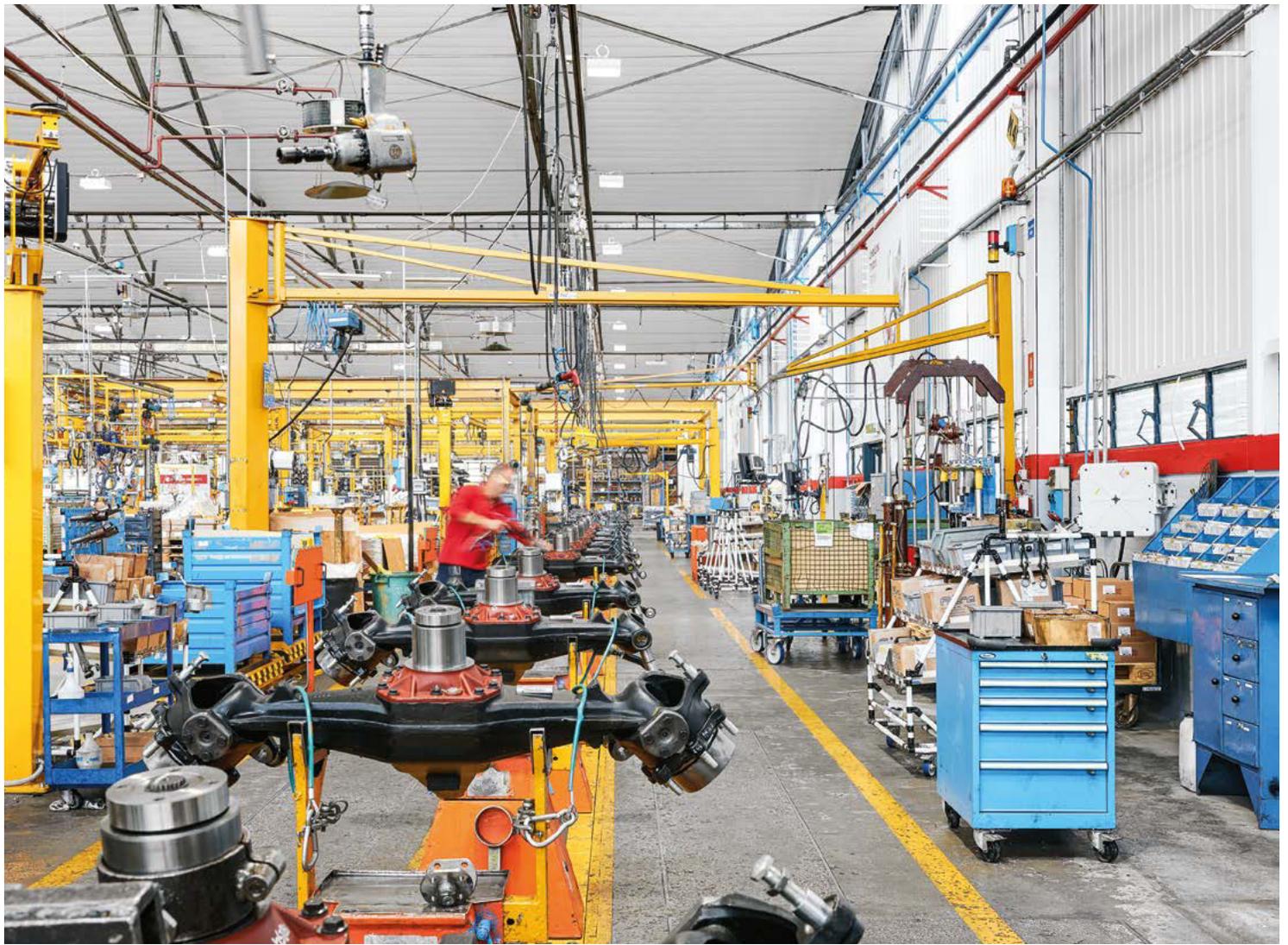


**Carraro SpA
energy transfer
systems**

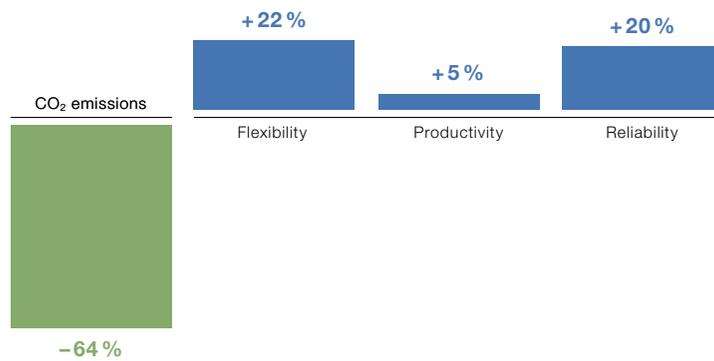




Light in line with the innovative spirit of the company.

The Carraro Group is world market leader in highly efficient, eco-friendly energy transfer systems. A key business area is the production of vehicles and engines for agricultural and construction applications. One of the six production sites, together with the company headquarters, is located near the city of Padua in Northern Italy. High energy and maintenance costs prompted the publicly listed company to refurbish the lighting system in the 18,000 square metre production hall. In line with the corporate ethos of the company, the decision was made to install the smallest, most powerful and most efficient high-bay LED luminaire currently available on the market. Within just one year, the refurbished lighting system will have paid for itself through reduced energy, relamping and cleaning costs. Dimmable CRAFT luminaires combined with a DIMLITE lighting control system help cut CO₂ emissions by 64 %, whilst at the same time increasing flexibility, productivity and reliability.

zumtobel.com/industrialighting



Carraro Headquarters, Campodarsego (Padua) | IT

Electrical consultants and installers: EnergEtica, Carraro SpA, Campodarsego (Padova) | IT
Lighting solution: CRAFT 140W wide beam LED high-bays with a DIMLITE 4ch daylight-based lighting control system

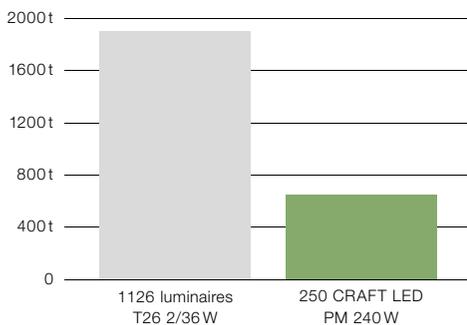
1. CO₂ efficiency and cost efficiency

-64% CO₂

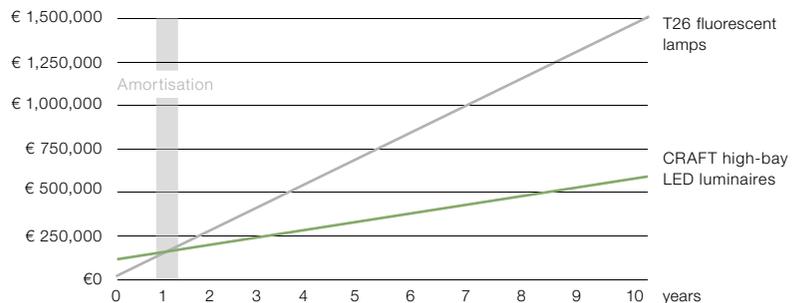
High-bay LED luminaire cuts energy consumption by two thirds

Before the refurbishment of the lighting system, the 264 metre production area was illuminated by 1 126 conventional luminaires. Like many similar industry applications, these luminaires were fitted with 36 W T26 fluorescent lamps. The complete lighting solution was replaced by 250 CRAFT 140 W high-bay LED luminaires. The combination of 12,600 lumens per high-bay and a square uniform light distribution meant that it was possible to reduce the number of luminaires without compromising lighting quality. The average energy consumption per year is now just 16.12 kWh/m², as opposed to 44.81 kWh/m² with the previous lighting solution. Maintenance costs are also considerably lower, which means that the refurbishment project will have paid for itself after approximately one year.

CO₂ emissions over service life (10 years)



Payback period: approx. 1 year (total cost)



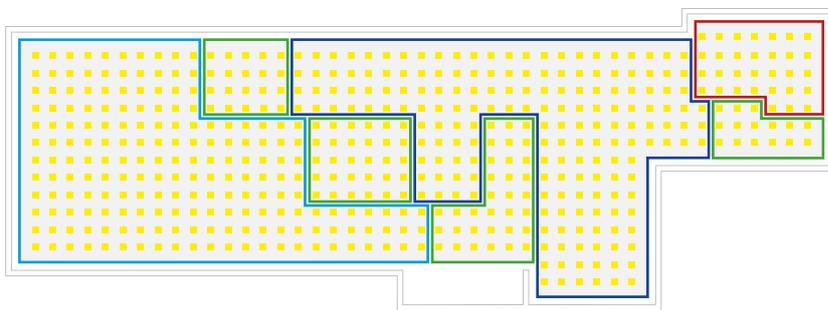
2. Flexibility

+22 %

Dimmable high-bay LED luminaires offer added flexibility

With the CRAFT luminaires arranged in a regular 6 by 6 metre grid, the entire hall is perfectly illuminated – uniformly and efficiently. In stark contrast to high-bays with a conventional round distribution, the square light distribution delivered by the CRAFT wide beam optic enables optimal illumination without any overlapping. The lighting level can be tailored to meet the specific needs of different visual tasks in the production areas using a simple DIMLITE controller with integrated daylight sensors. If the layout or function of a production area changes in the future, the lighting levels can be quickly and easily adjusted.

Production area in operation 264 x 72 x 6 m (length x width x height)



Current zones, which can now be redefined as required:

Production: 350 lx

Storage facility: 250 lx

Assembly: 400 lx

Painting: 350 lx

eco+



design award
winner

The CRAFT high-bay LED luminaire bears the eco+ label for especially resource-friendly products. For more information on eco+, please go to zumtobel.com/eco

3. Productivity

+5 %

Better performance through better lighting

High-quality lighting is known to increase employee productivity, as appropriate illuminance levels and uniform lighting distribution ease tiredness and thereby help reduce error rates. Good use of daylight can enhance wellbeing. The average illuminance level of 200 lx for all production areas provided by the previous lighting solution with T26 fluorescent lamps was not sufficient. The new CRAFT high-bay LED luminaires provide average illuminance levels of 300 lx and can also be adjusted to meet the requirements of various activities, depending on the amount of daylight present. Whilst no more than 250 lx is required in the storage facility, the optimum illuminance level for the assembly area is 400 lx.

The lighting system before and after refurbishment



Before: In all production areas, the average illuminance level of 200 lx was below the recommended value for the different various tasks.



After: High uniformity, an intermediate light colour of 4000K and higher average illuminance levels of 300 lx support employee productivity.

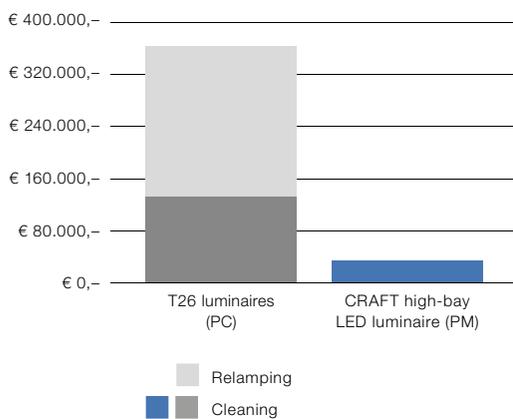
4. Reliability

+ 20 %

High safety levels despite fewer luminaires

With a diffuser made of clear polymethyl methacrylate (PMMA) and an additional toughened safety glass cover, the CRAFT high-bay LED luminaire is ready to meet the many challenges of demanding industrial applications. Compared to the old luminaires with a polycarbonate housing, CRAFT is considerably more resistant to substances containing oil. Thanks to the IP 65 rating, CRAFT is also protected from moisture and dust. Air flows through the luminaire to limit dust accumulation and ensure excellent thermal management to support the long service life. By replacing T26 lamps with LEDs, relamping at regular intervals is now a thing of the past as well.

Maintenance costs over service life (10 years)



CRAFT for highly demanding industrial applications



High resistance against substances containing oil and increased protection against moisture and dust ensure low maintenance requirements and a long service life.



IP 65



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Top quality – with a five-year guarantee.

As a globally leading luminaire manufacturer, Zumtobel provides a five year manufacturer's guarantee on all Zumtobel branded products subject to registration within 90 days from the invoice date and in accordance with the terms of guarantee at zumtobel.com/guarantee.

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