



Resolux Group

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Udvikling af LED belysning til EX områder.

Final report

Oktober 2018



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1 Project Details

Project title	Development of LED lighting for EX areas
Project identification (program abbrev. and file)	EUDP Journal nr. 64014-0574
Name of the programme which has funded the project	EUDP
Project managing company/institution (name and address)	Resolux ApS Tjørnevej 6 5853 Ørbæk
Project partners	Resolux ApS
CVR (central business register)	DK-27180663
Date for submission	Oktober 2018

2 Project objective and results

2.1 In English

Goal: Developing new LED light solutions and spare parts that that can replace existing light solutions with minimum energy savings of 50%.

2.1.1 Purpose

The purpose of the project is to develop LED lighting solution for EX areas that comply with the requirements for the EX standards concerning protection against explosive gas atmospheres, combustible dust etc. This product development project will contribute to support the global energy savings initiatives. LED solutions for EX areas can be used in many different industrial segments, but Resolux will only focus on offshore oil segment.

However, international and political flows in the offshore oil segment has change and the business case, which Resolux has displayed with project start is no more applicable. In December 2016 change in project scope has been requested and approved with the new scope / purpose:

Developing of LED lighting solution, related to the maritime environment.

2.1.2 Results

The project has to a certain point been a success despite that the desired goal was not fulfilled. Prototypes for LED floodlight has been developed with different design.

2.2 In Danish

Mål: Udvikling af nye LED-lysløsninger og reservedele, der kan erstatte eksisterende lysløsninger med mindst energibesparelser på 50%.

2.2.1 Formål

Formålet med projektet er at udvikle LED-belysningsløsning til EX-områder, der opfylder kravene til EX-standarderne vedrørende beskyttelse mod eksplosive gasatmosfærer, brændbart støv mv. Dette produktudviklingsprojekt vil bidrage til at understøtte de globale energibesparelsesinitiativer. LED-løsninger til EX-områder kan anvendes i mange forskellige industrisegmenter, men Resolux vil kun fokusere på offshore oliesegment.

Imidlertid har internationale og politiske strømninger i offshore oliesegmentet ændret sig, og den forretningsmæssige business case som Resolux har udarbejdet ved projektets begyndelse, er ikke mere anvendelig.

I december 2016 blev der anmodet om og godkendt en ændring af projektomfanget med nyt formål:

Udvikling af LED-belysningsløsning relateret til det maritime miljø.

I forbindelse med produktudviklingsarbejdet til marineindustrien kunne projektledelsen efter nogle måneder vurdere, at det vil blive meget svært for Resolux at udvikle et produkt som prismæssigt vil blive konkurrencedygtigt med konkurrerende produkter. På den baggrund valgte ledelsen definitivt at afslutte projektet.

2.2.2 Resultater

Projektet har på mange punkter været en succes for Resolux. Prototyper er blevet udviklet ved LED spotbelysning i varierende designs.

3 Executive summery

In the project, a functioning prototypes of LED floodlight has been developed. The functionality has been shown on a full-scale mockup where heat transport and light output calculations could be measured and calculated in order to maximize and control the light output and at the same time minimize the energy consumption.

Compared to existent methods and technologies - fluorescent light technology – LED lights with LED lens has significant advantages. This has been demonstrated in the project

4 Project objectives

The key objective of the project was to develop a LED lighting fixture.

The activities were divided into 7 Work Packages. Below follows a description of whether the objectives of each work package were achieved, whether development happened as foreseen, and whether the agreed upon milestones were achieved.

Work Package No.	WP1
Work Package name	Define requirements specification
Objective	Defining zones, the product should cover regarding requirements for materials properties, ambient temperature, product dimensions, strength and life time, light performance, protection against water and dust and easy installation and service.
How does the work package evolve	The objective of WP1 was achieved according to schedule.
Milestones	MS 1:

Work Package No.	WP2
Work Package name	Product design
Objective	Creations of drawings, light simulations, light calculations, heat transport simulations and product cost optimization.
How does the work package evolve	The objective of WP2 was achieved according to schedule.
Milestones	None in WP2:

Work Package No.	WP3
Work Package name	Development of prototype
Objective	3D print prototype, manufacturing of prototype, redesign.
How does the work package evolve	The objective of WP3 was achieved according to schedule.
Milestones	MS 2:

WP4, WP5, WP6 and WP7 has not been initiated.



5 Project results and dissemination of results

The main activities in the project was to develop LED lighting solution, related to the maritime environment.

Offshore product

Low light Med. Light High Light

Ex product

Low light Med. Light High Light

Light output	7.500lm	15.000lm	22.500lm	7.500lm	15.000lm	22.500lm
Effect	55	110	165	55	110	165

28 Lens options



Technical results for the developed prototypes “floodlight” has not been fully completed. This should have taken place in WP4.

6 Utilization of project results

Utilization of the project results specified to the LED lighting solution, related to the maritime environment, does not exist. Review and test of the prototypes is not fully completed. However, skills in light simulations and heat transfer / thermodynamic disciplines can be used in another future task Resolux will focus on.

7 Project conclusions and perspective

During the work with the project it become quite clear that a development department is needed with the right skills and competence. It has come to the conclusion that Resolux has its own development department today.

Competition in the market is very conservative, and only few major companies are supplying light solutions to the industrial market or end-user. In time we became aware of that a similar product compared to ours was going to be implemented in the market by one of the major suppliers. Thus, it did not make sense to continue the developing.

However, the project has in many terms been a success, because Resolux now have its own R&D department with a reasonable setup. An R&D department, which among other can conduct light simulations and heat transfer calculations that can be used in a wide range of other markets. Further, a new stage gate- and agile project developing model has been implemented in the quality management system, which together with other projects can be used.



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8 Annex