
CARBON OFFSETTING
THE THORLUX WAY
Thorlux Lighting

## DEVAUDEN, MONMOUTHSHIRE, UK

# Contents

# THE THORLUX COMMITMENT

Thorlux Lighting is committed to minimising the environmental impact of both its manufacturing processes and its products. However, even with the most responsible approach, some carbon dioxide ($CO_2$) and other greenhouse gases (GHG), collectively referred to as $CO_2$ equivalent ($CO_2e$), will be released into the atmosphere as an indirect result of factory and selling activities and customers' use of luminaires. In 2009 Thorlux designed an ambitious carbon-offsetting scheme to help compensate for these emissions.

## Minimising the environmental impact

Thorlux has worked hard to develop and implement a truly effective environmental management system and is proud to have achieved ISO 14001:2015 certification. ISO 14001:2015 confirms that a management system meets the highest of international environmental standards.

In June 2019, parliament passed legislation requiring the government to reduce the UK's net emissions of greenhouse gases by 100%, relative to 1990 levels, by 2050. Doing so would make the UK a 'net zero' emitter. Net zero refers to achieving a balance between the amount of greenhouse gas emissions produced and the amount removed from the atmosphere. $CO_2$ is seen as the largest contributor to climate change.

Thorlux, therefore, aims to minimise energy consumption associated with its products, both directly during manufacturing and selling activities and indirectly via the users of its products (lighting accounts for 20% of the energy consumed globally). By continuing to design and manufacture luminaires that are as optically and energy efficient as possible, fewer luminaires are required on a lighting scheme and power consumption is reduced. Thorlux luminaires use energy efficient control gear and LED circuits. Electronic control systems can further reduce energy consumption by reducing output in response to the presence of natural daylight or by turning lighting off due to a lack of presence. Use of the Thorlux SmartScan wireless lighting management system can show significant energy savings of up to 70% compared to a similar uncontrolled lighting system.

## What is a carbon footprint?

The carbon footprint is a measure of the amount of $CO_2$ and other greenhouse gases ($CO_2e$) emitted by a human activity or accumulated over the full life cycle of a product or service. A manufacturing process or lighting installation will always have a carbon footprint. Thorlux calculated that each luminaire indirectly creates an average of 2.8 kilograms of $CO_2e$ during its production and marketing to the point where it leaves the factory and is delivered on a company vehicle.

No matter how efficient the luminaire is and how effective the control system is, a lighting installation still requires some electricity to operate. A 250 watt luminaire, for example, may create up to 8.95 tonnes of $CO_2e$ due to the electricity used during its 20-year life. That is around 2500 times the amount generated during its production. A 116 watt garage forecourt floodlight operated on a 24-hour cycle will consume 1,120 kWh of electricity and indirectly produce 200kg* of $CO_2e$ per annum. Thorlux, being aware of its environmental responsibilities, has designed an in-house carbon offsetting scheme to enable the company and its customers to offset their carbon footprints.

## What is carbon offsetting?

Carbon offsetting is the compensation of $CO_2e$ emissions by equivalent savings elsewhere. Carbon offsetting projects may include the installation of energy saving devices in developing countries, the investment in renewable energy schemes such as wind farms or "carbon bank" tree planting schemes.

* British conversion factors from May 2023.


PLANT YOUR TREES
THROUGH THE
THORLUX SCHEME

## The Thorlux carbon offsetting project

Thorlux has chosen to plant trees. Why trees? Trees and other plants absorb $CO_2$ during photosynthesis. One tree grown to maturity in open space can absorb approximately 1 tonne of $CO_2$ over its lifetime. A forest covering many acres can effectively lock up $CO_2$, creating a "carbon sink". On 215 acres of land in Cwm Fagor, near Devauden in Monmouthshire, Thorlux (and the FW Thorpe Plc Group) plans to plant enough trees to offset group emissions each year. 179,412 trees have been planted between 2009 and 2023.

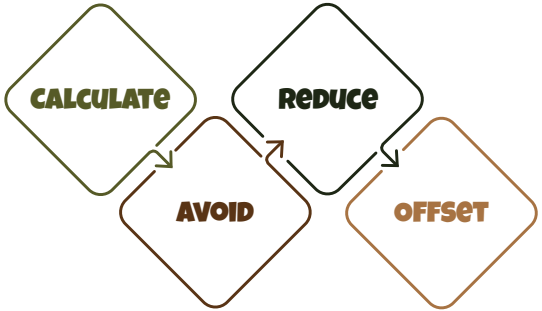
Native broadleaf species maximise the potential of the site, linking up adjoining ancient woodlands and so improving the local environment. Sustainable forest management ensures that the trees thrive and are harvested at appropriate times to be used in wood-related products, ensuring that the carbon is held within the wood well past the lifetime of the tree.

Forestry principles require that 4-5 trees are planted to ensure 1 grows to maturity, offsetting 1 tonne of $CO_2$. Faster growing species will reach maturity faster and will be thinned to allow room for the slower growing species to form the remaining forest.

The project has been designed and is managed by a silviculturalist (an expert in the development and management of forests), with a view to long term accreditation by the Forest Stewardship Council (FSC). It has the backing of the Natural Resources Wales and is the first site in Wales to gain approval with the Woodland Carbon Code (WCC), a voluntary standard for woodland creation projects in the UK to monitor and assess claims about the $CO_2$ sequestered. WCC guidelines refer to sequestered carbon as $CO_2e$.

## How you can help

Most importantly, you should first minimise your carbon footprint. Plan your lighting scheme using the most energy efficient solution that is practical for your application. Use automatic controls that take advantage of daylight ingress and use presence detection. Such controls offer the added benefit of extended luminaire life.




You should also consider the effect on the environment of producing the luminaires. Thorlux luminaires have a negligible effect on the environment during their production as the $CO_2e$ per luminaire is offset by Thorlux and the manufacturing environment is certified ISO 14001.

You can help compensate for your carbon footprint through the Thorlux carbon offsetting scheme. If you, our customer, join the scheme, the impact will be far greater than Thorlux can achieve alone and, by planting your trees through the Thorlux scheme, you can be confident of achieving the maximum benefit - our project is managed by experts to ensure a sustainable forest.

Tree planting is an effective approach to carbon offsetting. A typical school sports hall using 25 x 141W luminaires can be carbon offset by planting only 3 trees which then live to maturity.

It costs £7.50 to offset 1 tonne of $CO_2e$, which includes the planning, tree planting and long-term maintenance. The typical installation above would cost only £22.50 per year to offset at current emission levels (April 2020).

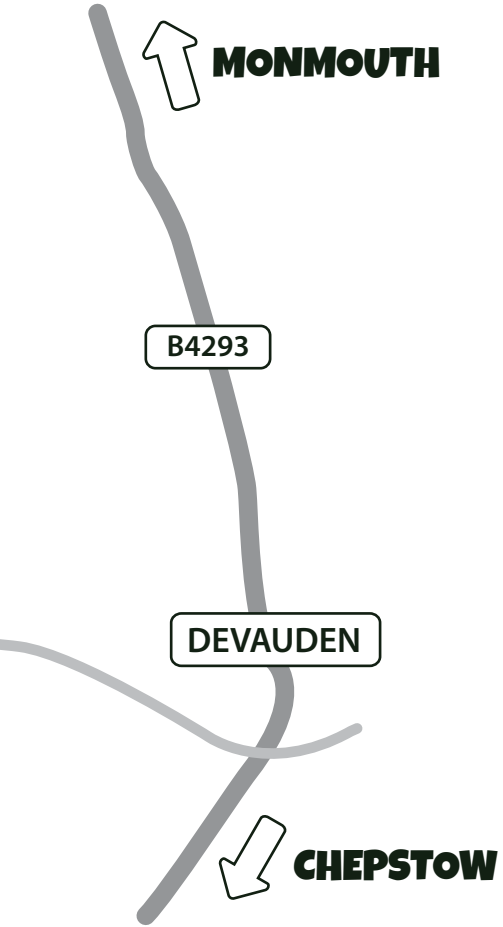
Approximately 1 tonne of $CO_2$ will be sequestered by ensuring 1 tree grows to maturity. To reach maturity more than one tree will be initially planted. 1 tonne of $CO_2$ equates to approximately 5,170kWh of electricity.

To calculate the number of tonnes to offset each year, divide the annual energy consumption of your installation (in kWh) by 5,170. For example, if an installation uses 18,000kWh per annum, you need to offset 3.5 tonnes. Alternatively you can use our online energy calculator to determine your $CO_2e$ emissions from Thorlux luminaires, a report will be generated in PDF format.

We also recommend offsetting packages with our quotations.

# ENERGY SAVING CALCULATOR AVAILABLE ON THORLUX.CO.UK


WOLVESNEWTON
215 ACRES OF LAND



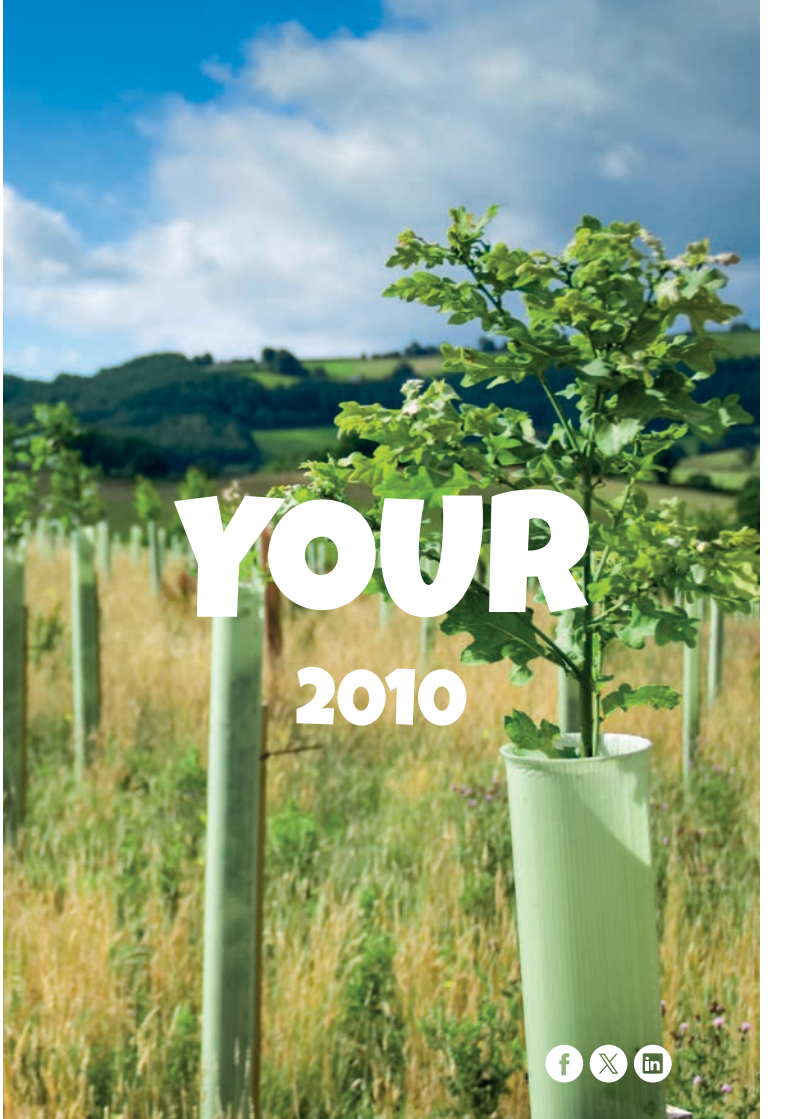

# DEVAUDEN PLAN

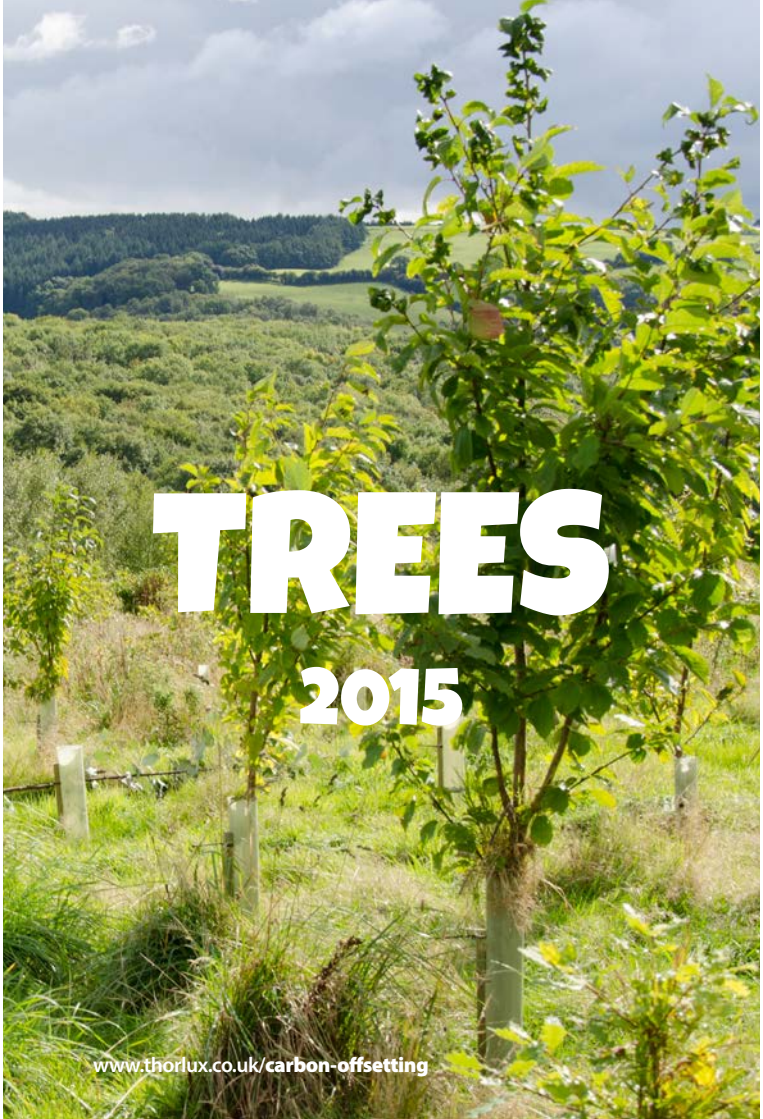
KEY

- Douglas Fir, Norway Spruce, Western Red Cedar
- Douglas Fir
- Alder, Oak, Hazel
- Douglas Fir, Oak, Mixed Broadleaves
- Oak, Mixed Broadleaves
- Oak, Wild Cherry, Mixed Broadleaves
- River
- Road

*No ash trees have been planted since ash dieback (chalara) was found in the UK*


WATCH
2009


YOUR
2010


TREES
2015


GROW
2016


2023
179,412
TREES
PLANTED
SINCE
2009

# SEQUESTERING OVER

# 44,385

## TONNES OF $CO_2e$ OVER A PERIOD OF 100 YEARS

**The site has a net capacity of 36,413 tonnes of $CO_2e$ for offsetting of Thorlux (and FW Thorpe Plc) emissions.**


QUESTIONS
&
ANSWERS

## Why is $CO_2e$ reduction so important?

In the greenhouse effect, the surface of the earth absorbs heat from the sun, re-emitting it as infrared radiation. This infrared radiation is absorbed by $CO_2$, water, ozone, methane and chloro-fluorocarbons (CFCs) and radiated back to earth.

An unnatural increase in greenhouse gases may therefore raise global temperatures and could cause climate change with such resulting phenomena as adverse weather patterns, the melting of polar ice caps and rising sea levels.

$CO_2$ is identified by the Intergovernmental Panel on Climate Change (IPCC) in their 2007 report "Climate Change 2007: Synthesis Report", as the single biggest contributor to climate change.

## What species of tree will Thorlux plant?

We will plant native broadleaf species - oak, hornbeam, birch, willow and wild cherry. The faster growing trees will be harvested (to FSC guidelines) to allow room for the slower growing species to mature.

## Why native broadleaf trees?

Some non-native species can absorb greater levels of $CO_2$ however they will have a negative effect on local wildlife. Native species will improve the natural environment and provide a habitat for indigenous natural wildlife.

## Isn't there enough woodland in the UK?

The UK was approximately 98% forest before man settled. At the start of the 1900's, most of the forest had gone; only 5% of the UK was covered. Now, at the beginning of the 21st century, this figure is back up to 12%, but only 2% is with native species, the remainder being fast-growing conifers for the timber trade. Much of the UK's indigenous wildlife cannot survive in these conifer forests, hence the importance of increasing the coverage of native trees.

## May I visit the site and see my trees?

Yes, you are welcome to visit. You will receive an e-mail detailing what you have purchased and the location of the site. The site will be open with free access all year round.

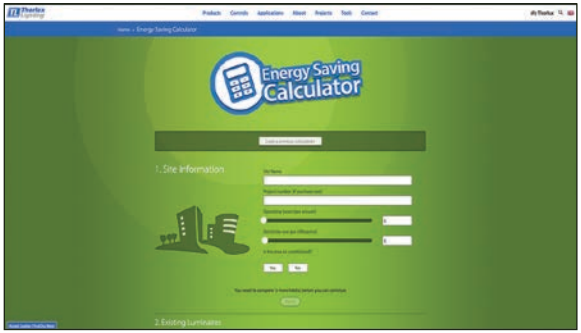
## How did Thorlux calculate its carbon footprint?

To quantify Thorlux's carbon footprint, we measured all electricity, gas and fuel used (including by company owned vehicles but excluding sub-contractors' activities) in our UK factory and selling activities. We multiplied these quantities by factors provided by the Department for Business, Energy and Industrial Strategy in its "Greenhouse Gas Reporting: conversion factors 2019" to estimate the total $CO_2e$ produced.

By dividing the total $CO_2e$ produced by the number of luminaires that Thorlux produces each year, we calculated that each luminaire creates an average of 2.8kg $CO_2e$ in its production and delivery.

## How do I calculate my carbon footprint?

Use our online energy calculator to determine your $CO_2e$ emissions from Thorlux luminaires, a report will be generated in PDF format.




## How do trees offset $CO_2$?

Trees absorb $CO_2$ during photosynthesis. (Trees and other plants use $CO_2$ and water in the presence of light to produce energy-containing carbohydrates.)

The $CO_2$ remains in the tree until it dies and decomposes. Through sustainable management, trees can be harvested and used in wood products, therefore trapping the $CO_2$ and not releasing it back into the atmosphere.

## How do I calculate how many trees will I need to plant?

It may be necessary to plant as many as 5 trees to achieve one tonne of sequestration due to forestry management requirements. Conditions will be monitored and adjusted as required by the silviculturalist and the Woodland Carbon Code. Each tree that grows to maturity will absorb approximately 1 tonne (1000kg) of $CO_2e$ over 100 years. 1 tonne of $CO_2e$ equates to approximately 5,170 kWh of electricity (0.1934kg per kWh, 2022 figure).

Divide your total carbon footprint (kg $CO_2e$) for a year by 1000 to provide the total number of trees required that year. Alternatively, divide your energy use in kWh by 5,170.

## What is ISO 14001?

ISO 14001 is an internationally accepted standard that sets out a framework of essential elements for putting an effective environmental management system in place.

An environmental management system allows an organisation to consistently control its impact on the environment, reduce the risk of pollution incidents, ensure compliance with environmental legislation, and continually improve business operations.

ISO 14001 addresses the delicate balance between maintaining profitability and reducing environmental impact.

## Will offsetting reverse climate change?

Carbon offsetting alone is not a cure for climate change. The most effective action you can take is to reduce your emissions. However, carbon offsetting can help reduce the impact of our energy consumption, and it makes us think more carefully about our effect on the environment.

## How can Thorlux controls save up to 70% electricity?

The Thorlux SmartScan System uses presence detection and daylight linking to control light levels. Lights turn off when an area is vacant. When the lights are switched on, the light levels adjust automatically to combine with available natural light. Measurements have proven significant energy savings, depending on natural light ingress and presence frequency.

## What is the FSC (Forest Stewardship Council)?

The FSC is an international organisation to promote responsible management of the world's woodlands. For further information, see www.fsc.org.

## What is the Natural Resources Wales?

Natural Resources Wales is a government department established for looking after the environment, with a division dedicated to forest management. For further information, see naturalresources.wales.

## What is the Woodland Carbon Code?

The Thorlux Woodland project is the first site in Wales to gain approval with the Woodland Carbon Code, a voluntary standard for woodland creation projects in the UK to monitor and assess claims about the $CO_2e$ sequestered. See woodlandcarboncode.org.uk.

# EVENTS


2008
PAST CHAIRMAN OF FW THORPE ANDREW THORPE PLANTS THE FIRST TREE


2011
MINISTER JOHN GRIFFITHS VISITS DEVAUDEN


2021
10 YEARS ON AND THE TREE CONTINUES TO MATURE

**2012**
**LUX FILMING AT DEVAUDEN**

## CASE STUDY

# REDDITCH TRAIN STATION

## THE CHALLENGE

The primary objectives of the new lighting scheme were to increase the light levels, reduce energy usage and to provide a safe and comfortable environment thus increasing security and passenger confidence. Further to this West Midlands Railway was keen to reduce its routine maintenance and emergency testing costs.

# SUMMARY

The existing lighting at Redditch Station consisted of both fluorescent and discharge luminaires. Thorlux proposed the use of high efficiency LED luminaires combined with SmartScan energy saving controls to maximise on all possible savings whilst providing full flexibility of lighting control. The factory fitted addition of a SmartScan transceiver, to a Thorlux Smart luminaire, introduces the latest in wireless mesh network technology and replaces the wired Motionline communication signals between luminaires with sophisticated, trouble free wireless communication.

Each transceiver can be individually programmed with a hand held SmartScan Programmer during commissioning, and assigned to work exclusively within a particular area, or group created within an area. Energy performance data and operational status can be retrieved using the SmartScan Programmer.

SmartScan uses 868MHz secure radio communication chosen for its excellent transmission distance and object penetration, especially useful within stations and depots. Each luminaire acts as a wireless node, repeating each command received onto the next luminaire, providing a robust system that will always find a communication path.

A further benefit of the SmartScan system is the ability to record and reports faults, to test and remotely monitor all emergency lighting and collect precise energy performance data. This information can then be uploaded using a Smartscan Gateway via GSM, without a need for a LAN connection, to a secure web based server that can be accessed remotely by authorized users by either a computer, smartphone or tablet.

High performance LED luminaires were selected for both the internal and external applications. The combination of highly efficient LEDs with superb optical control from the luminaire; putting the light where it is needed most.

The luminaires design lifetime of 100,000 hours has been improved further by under running luminaires through dimming capability and reduced switch cycles via the integral Smart sensors, providing light only when required, resulting in a further improvement to the luminaire lifetime in all areas across the station.

# INSTALLED LUMINAIRES


# SYSTEMS AND SERVICES

# SAVINGS VS PREVIOUS LIGHTING

## COST SAVINGS

1 Year
**£1,777**

5 Year Cumulative
**£9,818**

10 Year Cumulative
**£22,349**

*(assuming 5% energy inflation per annum)*

## CARBON SAVINGS

1 Year
**4.5 TONNES**

5 Year Cumulative
**22.5 TONNES**

10 Year Cumulative
**45 TONNES**

*(assuming 5% energy inflation per annum)*

# NUMBER OF TREES REQUIRED TO OFFSET EMISSIONS

| | 1 year | 5 years | 10 years |
|---|---|---|---|
| New Installation | 7 Trees | 35 Trees | 70 Trees |
| Old Installation | 28 Trees | 140 Trees | 280 Trees |

(Figures based on the 2019 emission factor 0.2773kg of $CO_2e$ per kWh)

# AWARDS

Since 2018 the FW Thorpe carbon offsetting scheme has been recognised at the prestigious woodland awards held at The Royal Welsh Show. Twenty two estates were judged throughout South Wales with the FW Thorpe woodland (Cwm Fagor) winning five awards:


**2018:**

The Milford Silver Medal for Best Broadleaf entry in Stand classes A,B and C

Best Managed Woodland 51-200 hectares – Silver

Broadleaf planting or restocking under 10 years old – Gold

**2019:**

Broadleaf planting or restocking under 10 years old – Gold

**2022:**

Best broadleaf woodland of between 11 and 40 years growth – Gold

Acknowledging the hard work of the silviculturalist, the judges praised the quality and health of the woodland and commented on the overall conservation impact including the abundance of wild flowers, butterflies and birds.

**Designers, manufacturers and suppliers of professional lighting systems**

INDUSTRIAL LUMINAIRES
COMMERCIAL LUMINAIRES
FLOODLIGHTING LUMINAIRES
ARCHITECTURAL LUMINAIRES
HEALTHCARE LUMINAIRES
HAZARDOUS AREA LUMINAIRES
RETAIL AND DISPLAY LUMINAIRES
CONTROLS AND SYSTEMS

A DIVISION OF FW THORPE PLC

**Thorlux Carbon Offsetting Project:**
**www.thorlux.com/trees**

The information given in this catalogue is typical and must not be interpreted as a guarantee of individual product performance and/or characteristics. We reserve the right to alter specifications and designs without prior notice.

bsi ISO 9001 Quality Management Systems CERTIFIED | ISO 14001 Environmental Management CERTIFIED | ISO 45001 Occupational Health and Safety Management CERTIFIED

FM 10913 EMS 532104 OHS 704131

Woodland Carbon $CO_2$de

SUSTAINING MEMBER Society of Light and Lighting

LIGHTING INDUSTRY ASSOCIATION

MADE IN THE UK

Lighting Council AUSTRALIA MEMBER

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