

Together for a better future

The TROX solutions for your
BREEAM certification

TROX® **TECHNIK**
The art of handling air
for indoor life quality



What is BREEAM?

BREEAM (British Research Establishment Environmental Assessment Method) is the world's leading sustainability assessment method assessing, rating and certifying master planning projects, infrastructure and buildings. It recognises and reflects the value in higher performing assets across the built environment lifecycle, from new construction to in-use and refurbishment.

Assessed via 9 main sustainability categories, each section has different weightings. They include pollution, land use & ecology, waste, materials, transport, management, health & wellbeing, energy, and water. The required rating will depend on how important each section is.

Credits are awarded and weighted for each category in order to generate the final score for the building.



RATINGS



Outstanding (≥ 85)

Excellent (≥ 70)

Very Good (≥ 55)

Good (≥ 45)

Pass (≥ 30)

CATEGORIES

CATEGORY		Max. credits
Management (MAN)	MAN3 - Responsible construction practices	6
	MAN4 - Commissioning & handover	4
	MAN5 - Aftercare	3
Health & Wellbeing (HEA)	HEA2 - Indoor Air Quality	5
	HEA4 - Thermal Comfort	3
	HEA5 - Acoustic Performance	2
Energy (ENE)	ENE1 - Reduction of energy use & carbon	15
	ENE2 - Energy monitoring	2
Materials (MAT)	MAT1 - Life Cycle Impacts	6
	MAT3 - Responsible Sourcing of construction products	4
Waste (WST)	WST4 - Speculative finishes	1
	WST5 - Adaptation of finishes	1
	WST6 - Functional adaptability	1
Pollution (POL)	POL2 - No _x Emissions	2
	POL5 - Reduction of noise pollution	1

What exactly is sustainability? Sustainability has a lot to do with climate change. Finding ways to stop or at least slow down the climate change is in fact the main aspect of sustainability. The climate change has become a decisive competitive factor for the future success of businesses. A sustainably acting business, however, will go further.

TROX, for one, has committed itself to becoming carbon neutral by 2040 at the latest: carbon neutral production, installation, distribution and action.

How? Mainly by developing and enhancing efficient systems and by finding innovative solutions.

Sustainability goes beyond carbon neutral production, though. It means making products that can be repaired when broken, it means reusing raw materials and organising logistics as energy-efficiently as possible, and it means a leadership culture committed to sustainability.

Indoor Life Quality is our top priority. Healthy, efficient and clean air distribution technology ensures:

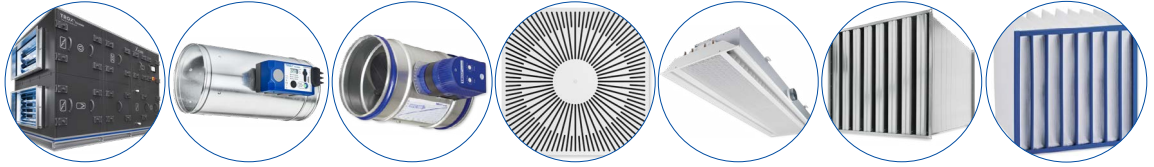
- increased well-being and quality of life
- a lower risk of infection and hence fewer sick days
- higher performance thanks to less contaminated air
- increased energy efficiency thanks to intelligent systems
- and not to forget: Our online customer portal ensures efficient design, ordering and-cooperation on construction sites as well as more efficient procedures overall.

We can meet this challenge only by working together. It is up to us. It is our responsibility to develop solutions to meet this all-encompassing challenge.

TROX Belgium



TROX PRODUCTS ANALYSED



Cat.	Max. Credits	AHU	VAV	CAV	Diffusers	Chilled beams	Sound attenuators	Filter Units & Elements
MAN3	6	1	1	1	1	1	1	1
MAN4	4	2	2	2	2	2	2	2
MAN5	3	1	1	1	1	1	1	1
		4	4	4	4	4	4	4
HEA2	5	2	2	2	2	2		2
HEA4	3	2			1	2		
HEA5	2	1	1	1	1	1	1	
		5	3	3	4	5	1	2
ENE1	15	6			1	3	1	
ENE2	2	1	1	1				
		7	1	1	1	3	1	
MAT1	6	1	1	1	1	1	1	1
MAT3	4	1	1	1	1	1	1	1
		2	2	2	2	2	2	2
WST4	1				1	1		
WST5	1	1			1	1		
WST6	1	1	1	1	1	1	1	1
		2	1	1	3	3	1	1
POL2	2	1				1		
POL5	1	1	1	1	1	1	1	
		2	1	1	1	2	1	
Total	56	22	12	12	15	19	10	9





MANAGEMENT



MAN3

Responsible construction practices

Aim

To recognise and encourage construction sites which are managed in an environmentally and socially considerate, responsible and accountable manner

Parameters

Environmental Management (1 credit)

- The principal contractor operates an environmental management system (EMS), third party certified to ISO 14001/EMAS or an equivalent standard
- Implement best practice pollution prevention policies and procedures on site

All TROX products meet top quality standards. We use conclusive certification procedures, such as certification by the RLT Manufacturer's Association or EUROVENT, to make our products transparently comparable with regard to their energy efficiency. In line with the fundamental concept of our corporate philosophy and to ensure optimised product quality and a long and efficient service life, we do not settle for minimum standards, but go far beyond these certain criteria.

Product Analysis		Credits
Air Handling Units	X-Cube	1
	X-Cube compact	1
VAV Terminal units	TVE	1
CAV Terminal Units	VFC	1
	VFL	1
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
	Pureline	1
Passive & Active Chilled beams	Chilled beams	1
Sound attenuators	Splitter sound attenuators	1
	Splitters	1
	Circular silencers	1
Filter Units & Elements	Filter elements	1



MAN4

Commissioning and handover

Product Analysis		Credits
Air Handling Units	X-Cube	2
	X-Cube compact	2
VAV Terminal units	TVE	2
CAV Terminal Units	VFC	2
	VFL	2
Ceiling Diffusers	Airnamic	2
	Xarto	2
	TID	2
	RFD	2
	FD	2
	VDW	2
	Pureline	2
Passive & Active Chilled beams	Chilled beams	2
Sound attenuators	Splitter sound attenuators	2
	Splitters	2
	Circular silencers	2
Filter Units & Elements	Filter elements	2

Aim

To encourage a properly planned handover and commissioning process that reflects the needs of the building occupants

Parameters

Commissioning building services (1 credit)

- For buildings with complex building services and systems, a specialist commissioning manager is appointed
- For simple building services, this role can be carried out by an appropriate project team member

Handover (1 credit)

- A building or home user guide is developed
- A training schedule is prepared for building occupiers
 - The design intent of the building
 - The available aftercare team
- Introduction to, and demonstration of, installed systems
- Introduction to the building user guide
- Maintenance requirements, including any maintenance contracts and regimes in place





MAN5

Aftercare

Aim

To provide post-handover aftercare to the building owner or occupants during the first year of occupation to ensure the building operates and adapts

Parameters

Seasonal commissioning (1 credit)

- The seasonal commissioning activities will be completed over a minimum 12-month period, once the building becomes substantially occupied

We are there to help our customer. From providing technical advice to ensuring the smooth functioning of our components and systems.

Client-oriented services are an integral part of the successful ventilation and air conditioning solutions at TROX. They decidedly improve the cost-effectiveness of any property during its life.

TROX supports its customers in the engineering, procurement and operation of ventilation and air conditioning systems for the entire lifecycle of the project.

Product Analysis		Credits
Air Handling Units	X-Cube	1
	X-Cube compact	1
VAV Terminal units	TVE	1
CAV Terminal Units	VFC	1
	VFL	1
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
	Pureline	1
Passive & Active Chilled beams	Chilled beams	1
Sound attenuators	Splitter sound attenuators	1
	Splitters	1
	Circular silencers	1
Filter Units & Elements	Filter elements	1



HEALTH & WELLBEING



HEA2

Indoor air quality

Aim

To recognise & encourage healthy internal environment through the specification & installation of appropriate ventilation, equipment and finishes

Parameters

Indoor Air Quality (IAQ) plan (1 credit)

Ventilation (1 credit)

- National best practice standard for ventilation
- Sufficient distance between air intake & exhaust
- CO² or air quality sensors

“The human being is the yardstick, and people’s well-being is our goal”.

This is how Heinz Trox summed up his life’s work. Trox placed great emphasis on providing long-term support for research and the next generation of scientists, particularly in the field of air conditioning technology.

The positive effects of good room air quality are beyond question: high-quality air boosts well-being and improves performance. Infections and allergic reactions caused by airborne bacteria and particles are kept at bay, resulting in fewer days lost to illness. For maximum energy efficiency, building shells are now being sealed with ever-greater care to prevent unwanted heat losses. For this reason, mechanical ventilation is an essential component of any modern building.

Product Analysis		Credits
Air Handling Units	X-Cube	2
	X-Cube compact	2
VAV Terminal units	TVE	2
CAV Terminal Units	VFC	2
	VFL	2
Ceiling Diffusers	Airnamic	2
	Xarto	2
	TID	2
	RFD	2
	FD	2
	VDW	2
	Pureline	2
Passive & Active Chilled beams	Chilled beams	2
Filter Units & Elements	Filter elements	2



HEA4

Thermal comfort

Product Analysis		Credits
Air Handling Units	X-Cube	2
	X-Cube compact	2
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
	Pureline	1
	Passive & Active Chilled beams	Chilled beams

Aim

To ensure that appropriate thermal comfort levels are achieved through design and controls are selected to maintain a thermally comfortable environment for occupants within the building

Parameters

Thermal modelling (1 credit)

- Analysis of thermal comfort level using Predicted Mean Vote (PMV) & Predicted Percentage of Dissatisfied (PPD)
- Thermal comfort levels in accordance with European Standard EN ISO 7730:2005

Thermal zoning & controls (1 credit)

- Zones within the building and how the building services could efficiently and appropriately heat or cool these areas
- Occupant control required for these zones

People spend up to 90% of their time indoors: living, working, Expectations of comfort in indoor spaces are becoming increasingly important. Consequently, buildings should be designed to guarantee the indoor conditions. Furthermore, the climate change and the reduction of energy consumption form additional challenges.

TROX supports you in providing high system availability. Our systems allow for a demand-based, individual room control strategy. You can monitor and control all relevant functions and zones as well as provide balancing of all components.





HEA5

Acoustic performance

Aim

To ensure the building's acoustic performance, including sound insulation meets the appropriate standards for its purpose

Parameters

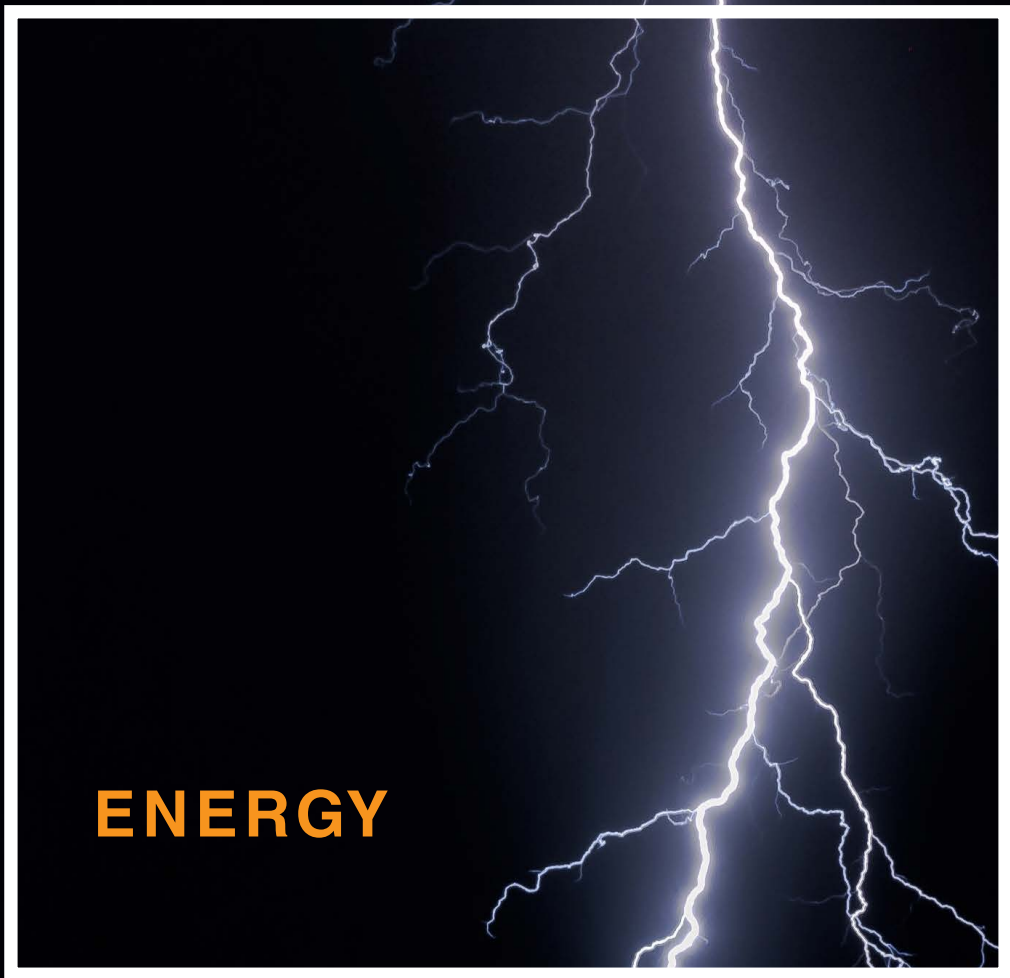
Indoor ambient noise and sound insulation (1 credit)

- All unoccupied spaces comply with the indoor ambient noise level targets
- A SQA carries out ambient noise measurements
- The sound insulation comply with the privacy index

Indoor climate also means: no noise pollution.

In ventilation systems, noise stems from a variety of components such as the fans or the fire dampers. To comply with a specified noise level, sound attenuators are added to suitable locations in the ventilation system. The sound attenuators should have adequate silencing capabilities, low air resistance and be as small as possible.

Product Analysis		Credits
Air Handling Units	X-Cube	1
	X-Cube compact	1
VAV Terminal units	TVE	1
CAV Terminal Units	VFC	1
	VFL	1
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
	Pureline	1
Passive & Active Chilled beams	Chilled beams	1
Sound attenuators	Splitter sound attenuators	1
	Splitters	1
	Circular silencers	1



ENERGY



ENE1

Reduction of energy use and carbon emissions

Aim

To recognise and encourage buildings that minimise their operational energy consumption through good design

Parameters

Option 1: Using approved Building Energy Calculation Software (15 credits)

- Defining the building energy performance using building energy calculation software
 - Assessed building compared to notional equivalent
 - Notional building = local regulations or ASHRAE Standard (if local regulations are less rigorous)
- Energy modelling study & qualified engineer required
 - Modelling software = National Calculation Methodology or BRE approved (country-specific)
 - Approved software: Designbuilder, TRNSYS, EPB-Software 3G

Product Analysis		Credits
Air Handling Units	X-Cube	6
	X-Cube compact	6
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
	Pureline	1
Passive & Active Chilled beams	Chilled beams	3
Sound attenuators	Splitter sound attenuators	1
	Splitters	1

The climate change has become a decisive competitive factor for the future success of businesses. A sustainably acting business, however, will go further. TROX, for one, has committed itself to becoming carbon neutral by 2040 at the latest: carbon neutral production, installation, distribution and action. How? Mainly by developing and enhancing efficient systems and by finding innovative solutions. But also by building factories where sustainability is the guiding principle, to allow for carbon neutral production right from the start.



ENE2

Energy monitoring

Product Analysis		Credits
Air Handling Units	X-Cube	1
	X-Cube compact	1
VAV Terminal units	TVE	1
CAV Terminal Units	VFC	1
	VFL	1

Aim

To recognise and encourage the installation of energy sub-metering that facilitates the monitoring of operational energy consumption

Parameters

Sub-metering of major energy-consuming systems (1 credit)

- Where the total consumption of any single end-use category is estimated to account for more than 10% of the annual energy consumption for a given fuel type, it is necessary for this end-use to be sub-metered

It is possible to integrate several TROX systems such as LABCONTROL, X-CUBE Control, X-AIRCONTROL and TROXNETCOM. The building information model then allows you via remote access to see, analyse and consequently optimise all functions and energy consumption values for each individual room.

The Remote Operations Center and the TROX Cloud allow you to manage many objects and projects at the same time from a central interface. Simple and convenient.



MATERIALS



MAT1

Life cycle impacts

Product Analysis		Credits
Air Handling Units	X-Cube	1
	X-Cube compact	1
VAV Terminal units	TVE	1
CAV Terminal Units	VFC	1
	VFL	1
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
	Pureline	1
	Passive & Active Chilled beams	Chilled beams
Sound attenuators	Splitter sound attenuators	1
	Splitters	1
	Circular silencers	1
Filter Units & Elements	Filter elements	1

Aim

To recognise & encourage the use of robust appropriate life cycle assessment tools & specification of materials with low environmental impact over full building life cycle

Parameters

Measuring the life cycle environmental impact of building elements (5 credits)

- Building fabric, services & landscaping
- Evaluating a range of material options for the building with a Life Cycle Assessment (LCA) tool

In commercial environments, between 10 and 20% of electrical energy is consumed in Europe for the purpose of powering fans in room air conditioning systems. While it was previously only possible to assess filters based on how effectively they removed particles from the air and not in terms of how energy-efficient they are in operation, the energy-related assessment is now receiving much more attention.

TROX has developed a Life Cycle Cost (LCC) tool in order to calculate the economic efficiency of fine dust filters on the basis of the strict Eurovent energy efficiency classification. With the aid of their individual usage data, customers have the option of selecting the filter that offers the highest level of economic efficiency compared to other filters in terms of investment, energy and maintenance costs.

The energy costs calculator for TROX filters lets you find out quickly and easily what energy costs various filters incur over time. The biggest saving potential in terms of the life cycle costs arises from the energy costs where, depending on your choice of filter, you could save over 60%





MAT3

Responsible sourcing of construction products

Aim

To recognise and encourage buildings that minimise their operational energy consumption through good design

Parameters

Using materials with responsible origin (3 credits)

- Environmental Management System (EMS) needed
 - ISO14001
- Output BREEAM MAT3 Calculator required

Our suppliers are also taken into account in our sustainability assessment of the entire value chain of product creation. This is why we pay particular attention to ensuring that our suppliers fulfil the social, ethical and environmental standards that we are committed to. With our Code of Conduct, our suppliers around the world undertake to act in line with the TROX values of integrity and fairness.

Product Analysis		Credits
Air Handling Units	X-Cube	1
	X-Cube compact	1
VAV Terminal units	TVE	1
CAV Terminal Units	VFC	1
	VFL	1
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
	Pureline	1
Passive & Active Chilled beams	Chilled beams	1
Sound attenuators	Splitter sound attenuators	1
	Splitters	1
	Circular silencers	1
Filter Units & Elements	Filter elements	1

WASTE





WST4

Speculative finishes

Aim

To encourage the specification and fitting of finishes selected by the building occupant and therefore avoid unnecessary waste of materials

Parameters

(1 credit)

- For tenanted office areas prior to full fit-out works, carpets, other floor finishes and ceiling finishes have been installed in a show area only
- In an office building developed for a specific occupant, that occupant has selected the specified floor and ceiling finishes
- For multiple dwellings (where the future occupant is not known), floor, kitchen and bathroom finishes have been installed in a show area only
- In a residential building, future occupants have selected at least three of the specified floor, kitchen and bathroom finishes

Product Analysis		Credits
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
	Pureline	1
Passive & Active Chilled beams	Chilled beams	1

To achieve our ambitious quality goals, we closely cooperate with suppliers to jointly develop and configure dedicated equipment that meets the requirements for our products and the requirements of our customers.

Our product's entire value chains and measures for improving the ecological footprint form a focus area of our sustainability strategy



WST5

Adaptation to climate change

Product Analysis		Credits
Air Handling Units	X-Cube	1
	X-Cube compact	1
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
	Pureline	1
	Passive & Active Chilled beams	Chilled beams

Aim

To recognise and encourage measures taken to mitigate the impact of extreme weather conditions arising from climate change over the lifespan of the building

Parameters

Adaptation to climate change – structural and fabric resilience (1 credits)

- Conduct a climate change adaptation strategy appraisal for structural and fabric resilience

We think of 'good air' as an essential commodity to which everyone should have access at any time and any place. This is why we are committed to creating intelligent ventilation and air conditioning systems, which not only provide maximum comfort, safety and reliability, but that actively contribute to climate protection, too.

To this end, we are involved in regional and global initiatives and committees, we have defined explicit targets with regard to energy savings and increased efficiency in our TROX X-Fit programme, and have set clear signals with our sustainability strategy.





WST6

Functional adaptability

Aim

To recognise and encourage measures taken to accommodate future changes of use of the building over its lifespan

Parameters

Functional adaptability (1 credit)

- A building-specific functional adaptation strategy study
- Functional adaptation measures have been implemented in the design

The expectations of owners are often the same: ecological and economic sustainability with high comfort and low investment costs. No two buildings are the same: different types of buildings, different uses, new or renovated. They all require an individual approach.

By being present in the early stages of the project, we are able to contribute our experience and knowledge. In this way, together, we achieve a sustainable solution at the highest possible level.

Product Analysis		Credits
Air Handling Units	X-Cube	1
	X-Cube compact	1
VAV Terminal units	TVE	1
CAV Terminal Units	VFC	1
	VFL	1
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
Passive & Active Chilled beams	Pureline	1
	Chilled beams	1
Sound attenuators	Splitter sound attenuators	1
	Splitters	1
	Circular silencers	1
Filter Units & Elements	Filter elements	1



POLLUTION



POL2

NO_x emissions

Aim

To contribute to a reduction in national NO_x emission levels through the use of low emission heat sources in the building

Parameters

Reduction of noise pollution
(1 or 2 credits)

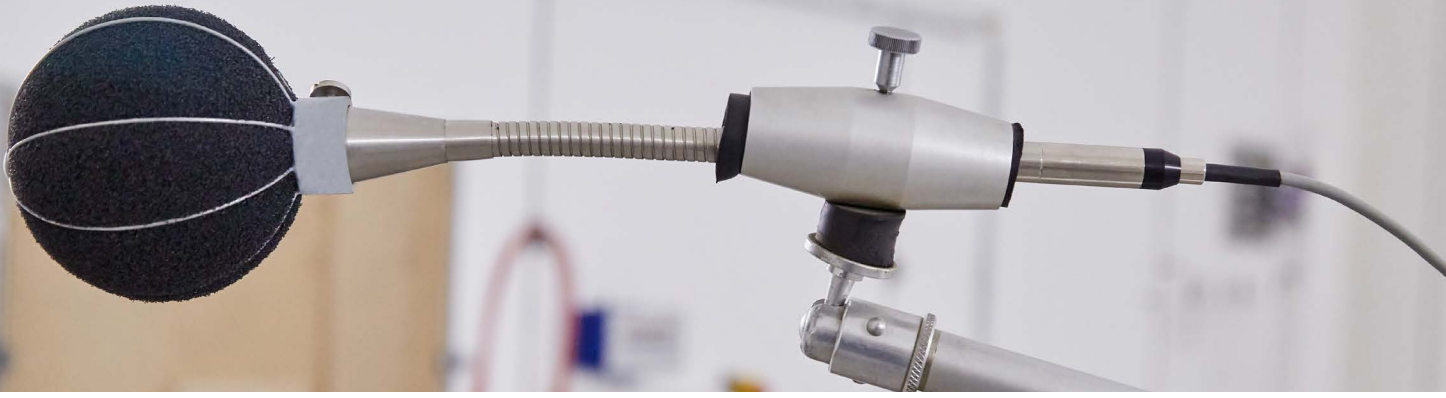
- Where the plant installed to meet the building's delivered heating and hot water demand has, under normal operating conditions, a NO_x emission level as follows:
 - ≤ 56 mg/kWh = 1 credit
 - ≤ 40 mg/kWh = 2 credits
- BREEAM scoring and reporting tool: direct and indirect NO_x emissions energy consumption arising from systems installed to meet the building's space heating, cooling and hot water demands

Product Analysis		Credits
Air Handling Units	X-Cube	1
	X-Cube compact	1
Passive & Active Chilled beams	Chilled beams	1

Each project is a challenge to provide comfort in a building in an energy-efficient way, with minimal impact on the environment. This means that technology must become increasingly sophisticated to meet the changing requirements.

For example, the Ecodesign Directive prescribes that air handling units must offer a heat recovery efficiency of more than 73%, and RAC systems more than 68%. A run around coil system from TROX with a TROX hydraulic unit including special RAC control guarantees highly efficient heat recovery of up to 80 %.

In order to meet these more demanding requirements, TROX has also created an AHU configurator. This web-based tool lets you configure your air handling unit in a simple manner based on your parameters. You specify the type of installation and heat recovery and enter the key sizing points (volume flow rate, external pressure demand, local air temperatures & humidity), the desired air filtration and the required heating or cooling capacity. In just a few seconds, the system will determine the best possible unit design and project the lifecycle costs for the specific location.



POL5

Reduction of noise pollution

Product Analysis		Credits
Air Handling Units	X-Cube	1
	X-Cube compact	1
VAV Terminal units	TVE	1
CAV Terminal Units	VFC	1
	VFL	1
Ceiling Diffusers	Airnamic	1
	Xarto	1
	TID	1
	RFD	1
	FD	1
	VDW	1
	Pureline	1
Passive & Active Chilled beams	Chilled beams	1
Sound attenuators	Splitter sound attenuators	1
	Splitters	1
	Circular silencers	1

Aim

To reduce the likelihood of noise, arising from fixed installations on the new development, affecting nearby noise-sensitive buildings

Parameters

Reduction of noise pollution (1 credit)

- Sufficiently low external noise levels
- Remedial works if necessary
- Noise impact study by qualified acoustician required

According to the World Health Organisation (WHO), exposure to noise presents one of the largest health risks to the population of Western Europe. Efficient ventilation that integrates sound attenuation will continue to grow in importance. By utilising the right products, while engaging in appropriate dialogue with acoustic consultants, contractors and developers can ensure noise pollution is kept to a minimum, balanced with compliant levels of ventilation.

How can TROX help with your BREEAM score?

TROX is the leader in the development, manufacture, and sale of components, applications, and systems for indoor climate and ventilation. Dedicated research has made TROX an innovative leader in all these fields.

In close cooperation with customers, TROX develops specific systems that take into account the relevant criteria for each building and meet the requirements of the users. This close cooperation leads to sustainable solutions that improve comfort and protect the environment.

You can achieve up to **22 BREEAM credits** when using the **TROX products** included in this brochure. The feasibility of obtaining these credits has been analysed through project-based verification by an independent and qualified engineering consultancy, ENCON, specialised in sustainability solutions.

REFERENCES WITH RATING "EXCELLENT" IN BELGIUM

- AGC Glass HQ
- Copernicus Building
- Cross Point
- Docks Bruxsel
- Food Experience Center Vandemoortele
- PWC HQ
- La Toison D'Or
- Montagne Du Parc - Warandeberg



Docks Bruxsel



TROX[®] TECHNİK

The art of handling air

for indoor life quality

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