MICROSHADE® IN DGNB–CERTIFIED CONSTRUCTION

MicroShade®

Introduction to
DGNB

DGNB, (**D**eutsche **G**esellschaft für **N**achhaltiges **B**auen), is an internationally recognized certification scheme that evaluates and promotes sustainability in construction and urban planning. The DGNB Certification Scheme is designed to ensure that buildings and urban areas meet high standards of environmental, economic, and social sustainability.

The DGNB Certification considers various aspects of a building or an urban area, including energy efficiency, materials and resource consumption, health, and comfort for users as well as integration into the surrounding environment. The certification is based on a comprehensive assessment, where a number of criteria and parameters are assessed, and points are awarded in relation to how well the building or urban area meets these criteria.

The benefits of achieving a DGNB certification include recognition of sustainable practices, improved market value and viability of buildings, reduced energy consumption and environmental impact, and increased user comfort and well-being.

DGNB Manuals

The DGNB Certification system has been localized and translated into multiple languages to align with the specific requirements of each host country. As a result, awards and criteria may vary when different DGNB manuals are utilized. In this brochure, we refer to the following DGNB manuals:

- DGNB 2020 DK, Languages: DK
- DGNB 2016 DK, Languages: DK

In the following statements, the year will be indicated if the statement is unique to the specific DGNB manual.

DGNB **CERTIFICATE**

To obtain the DGNB classification for its construction, points must be earned within the 36 criteria to meet the minimum requirement. There are four certificate levels, however the Danish version only consider silver and above.

Silver:	50 % Total Performance
	35 % In each Quality
Gold:	65 % Total Performance
	50 % In each Quality
Platin:	80 % Total Performance
	65 % In each Quality

DGNB – **MANUAL**

The manual covers new construction and extensive renovations within the following building types:

- Office and Administration Buildings
- Educational Buildings
- Residential Buildings
- Consumer Market Buildings
- Shopping Centre Buildings
- Department stores
- Logistics Buildings
- Production Buildings
- Hotel Buildings
- Mixed use

DGNB-criteria

The DGNB certification follows a structured framework consisting of criteria and sub-criteria categorized into six main areas. Each main area has specific evaluation points assigned to its criteria, and when applicable, checklist points are provided for sub-criteria. These checklist points contribute to the final evaluation points for each criterion.

The evaluation results are presented as a percentage of the maximum achievable points. Based on the percentage achieved, a building is awarded either a silver, gold, or platinum certification, indicating its level of sustainability and performance.

It's important to acknowledge that the specific criteria, sub-criteria, and evaluation points may vary depending on the version and language of the DGNB certification being used. Therefore, it is essential to refer to the relevant DGNB documentation packages and guidelines provided by MicroShade A/S or the DGNB itself for accurate and up-to-date information.

AWARDS

In addition to the certification levels, the DGNB has introduced various awards across different versions. For example, the DGNB 2016 DK introduced the DGNB Diamond as a secondary architectural quality award. In the DGNB 2020 DK the DGNB Heart was incorporated, which recognizes an extraordinary focus on human health. Where are five main categories within the DGNB heart, air quality, visual comfort, thermal comfort, acoustics, architectural value.

DGNB **DIAMOND**

In 2016, the DGNB Diamond was introduced as an additional award recognizing architectural quality. The DGNB Diamant assessment process involves two phases evaluated by a panel of expert judges. Points are awarded for each phase, contributing to the overall DGNB Diamond recognition.

2020 DK
DGNB **HEART**

DGNB Heart is an award for design with a focus on people's health and well-being. The heart is an independent distinction for health and comfort in the certification of a building and gives an extra focus on the users of the building. The heart is awarded if a combined 75% fulfillment of the DGNB heart indicators is achieved.

2020 DK
DGNB – **BONUSPOINTS**

A new addition to the DGNB 2020 and 2018 manual is the ability to earn extra points in the form of bonus points. These bonus points can be awarded to projects that stand out within the following categories:

International/Danish

- Promoting circular economy.
- Implementation of the additional UN sustainability goals.
- Utilizing innovative solutions and concepts.

Overview of criteria*
DGNB 2020 DK

This brochure provides an overview of the criteria highlighted for the DGNB 2020 DK version. For a detailed and specific list, please refer to the Documentation packages corresponding to your chosen version and country.

QUALITY	CRITERIA GROUP	CRITERIA NAME		
PROCESS QUALITY (**PRO**)	PLANNING (**PRO1**)	**PRO 1.1** Quality in the preparation of the project		
		PRO 1.4 Sustainability in contract tendering		BONUS
		PRO 1.5 Guidance on maintenance and use of the building		
		PRO 1.6 Architectural quality procedure	❤	BONUS
	QUALITY ASSURANCE OF EXECUTION (**PRO2**)	**PRO 2.1** Construction site/Construction process		BONUS
		PRO 2.2 Documentation of quality in execution	❤	
		PRO 2.3 Commissioning		
		PRO 2.4 User communication	❤	
ENVIRONMENTAL QUALITY (**ENV**)	IMPACT OF GLOBAL AND LOCAL ENVIRONMENT (**ENV1**)	**ENV 1.1** Life cycle assessment		BONUS
		ENV 1.2 Environmentally hazardous substances	❤	
		ENV 1.3 Responsible resource extraction		
	RESOURCE CONSUMPTION AND WASTE (**ENV2**)	**ENV 2.2** Drinking water consumption and wastewater discharge		
		ENV 2.3 Efficient land use		BONUS
		ENV 2.4 Biodiversity	❤	
ECONOMIC QUALITY (**ECO**)	TOTAL ECONOMY (**ECO1**)	**ECO 1.1** Total economy		BONUS
	FINANCIAL FUTURE SECURITY (**ECO2**)	**ECO 2.1** Flexibility and Adaptability	❤	BONUS
		ECO 2.2 Robustness	❤	

SOCIAL QUALITY (SOC)	**HEALTH, COMFORT AND USER SATISFACTION (SOC1)**	**SOC 1.1** Thermal comfort	❤	
		SOC 1.2 Indoor air quality	❤	
		SOC 1.3 Acoustic indoor climate	❤	
		SOC 1.4 Visual comfort	❤	
		SOC 1.6 Quality of outdoor areas	❤	
		SOC 2.1 Universal design	❤	
	FUNCTIONALITY (SOC2)	**SOC 3.2** Building-integrated art		
		SOC 3.3 Plan disposition	❤	
TECHNICAL QUALITY (TEC)	**TECHNICAL QUALITY (TEC1)**	**TEC 1.1** Fire Protection and Safety		
		TEC 1.3 The quality of the building envelope	❤	
		TEC 1.4 The adaptability of the technical systems		**BONUS**
		TEC 1.5 Design for ease of maintenance and cleaning	❤	
		TEC 1.6 Dismantling and recycling		**BONUS**
		TEC 1.8 Documentation with environmental product declarations (EPD)		
		TEC 3.1 Mobility infrastructure	❤	**BONUS**
THE QUALITY OF THE AREA (SITE)	**THE QUALITY OF THE AREA (SITE1)**	**SITE 1.1** Local environment	❤	
		SITE 1.2 The image and condition of the area and neighborhood		
		SITE 1.3 Traffic connections		
		SITE 1.4 Access to facilities in the immediate area	❤	**BONUS**

What is **MicroShade?**

MicroShade A/S is a Danish cleantech company founded in 2003 as a spin-off from the Danish Technological Institute. At MicroShade we first developed a solar shading solution where a passive steel membrane was used. The new MicroShade®, however, consists of a microstructure film which, when placed in between a 2- or 3-layer glazing unit, provides optimal solar shading while maintaining the view to the outside and ensuring pleasant daylight conditions. In combination, these parameters raise the quality of the indoor climate significantly compared to any other solar shading solution.

At MicroShade we strive to ensure better work environments, and at the same time reduce operating costs for building owners and their tenants.

MicroShade® – encapsulated between glazing panes
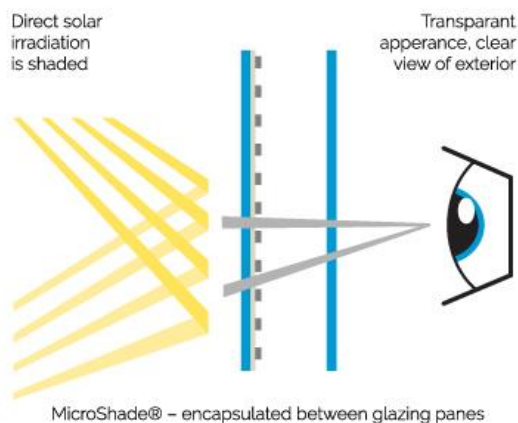
MicroShade® Technical Details

MicroShade® is a passive and highly effective shading solution fully integrated into either a double or triple pane insulating glazing unit. MicroShade® comprises an almost invisible film that combines UV and IR coatings with a structured micro-lamella. The shading effect of can be compared to that of exterior blinds - except the film is almost invisible to the human eye - so the view is maintained.

MicroShade® allows a high level of natural daylight to enter the building and is available in various configurations suitable for both facade and roof applications.

MicroShade contribution to
DGNB-certification

MicroShade® has the potential to contribute to several criteria in DGNB certification and can positively influence the awards and bonuses in the certification process.

Calculation guidelines and transparent file sharing makes it easy to compare MicroShade® in your project.

We have developed a comprehensive library of guidelines and files to ensure the correct and effective use of our products throughout all phases of construction. This extensive resource is freely available for download and utilization in your project. By providing these guidelines and files, MicroShade aims to promote good design practices and facilitate well-balanced decision-making from the beginning to the completion of your project.

MicroShade® - Product Environment Declaration

MicroShade provides an Environmental Product Declaration (EPD) that allows for a comparative analysis of Micro-Shade's product in relation to other similar products, specifically assessing their environmental performance. The EPD serves as a transparent and trust-worthy source of information, as it undergoes independent third-party verification, ensuring its reliability.

SWECO HQ, Copenhagen, DGNB GOLD

DGNB - Documentation packages

At [MicroShade](#), you will find our DGNB documentation packages, which contain relevant information for your DGNB project.

The Documentation packages can contain:

- EPD
- Technical User Manual
- Weighted View out Calculation
- Content of declaration
- Passive Design Concept   (DK)
- LCAbyg – Files   (DK)

The documentation also provides calculation guidelines to support calculating thermal comfort and daylighting. The guidelines can be found on our website under the tab "[FOR PROFESSIONALS](#)".

MicroShade also provides the simulation tool, SimShade, which can advise industry professsionals in glazing system compositions and shading solutions, ensuring informed decisions in the early design phase.

PACKAGES – **DOCUMENTATION**

On our website, you can find DGNB documentation packages for multiple versions of the DGNB in various languages. These documentation packages are available for download on our website: www.microshade.com

And Here:

- DGNB DK 2020 ([DK](#)/[UK](#))

- DGNB DK 2016 ([DK](#)/[UK](#))

ENV1.2 – **DOCUMENTATION**

There are no materials that are prohibited in the DGNB, but there are products where documentation of ingredients is required if the product is to be part of a DGNB-certified building - in the case of MicroShade® is no substance needed to be declared.

You can find more information in our Content of declaration in the documentation packages at [MicroShade](#).

MicroShade's contribution to
DGNB 2020 DK - certification of buildings

This list provides an overview of the criteria and the associated knowledge and product details offered by MicroShade in DGNB 2020 DK. It is important to note that the specific criteria in the DGNB may vary between countries and versions. Specific criteria that are influenced by the MicroShade in your DGNB certification can be found in the DGNB documentation packages found on our website.

CRITERIUM		What can MicroShade® do, and what do we provide?
PRO 2.4 User communication	♥	MicroShade provides a sustainability and technical user manual. More Information is in our technical user manual in the documentation packages.
ENV 1.1 Life cycle assessment	BONUS	An EPD on the MicroShade® is available which offers an analysis of the environmental performance of our product. More Information is in our technical user manual in the documentation packages.
ENV 1.2 Environmentally hazardous substances	♥	The MicroShade® has no material to declare. More Information is in our Declaration of content in the documentation packages.
ECO 1.1 Total economy	BONUS	The MicroShade® offers a life span equal to a window system, eliminating the need to replace the shading device. Furthermore, can an early price estimate to an LCC be taken directly from MicroShade online simulation tool (SimShade).
ECO 2.2.1 The climate screen's robustness	♥	The MicroShade® does not affect the robustness of the window system.
ECO 2.2.3 Passive design	♥	The MicroShade® is an element of a passive design concept designed to reduce the primary energy demand. Furthermore, is it in alignment with DGNB's focus on innovation. More Information is found in documentation packages.
SOC 1.1 Thermal comfort	♥	MicroShade provides thermal comfort guidelines for a large variety of building simulation tools. The guidelines provide instructions to calculate a building's thermal comfort, promoting health and well-being at work and home. **Guidelines:** IES-VE, BE18, IDA ICE, Ladybug Tools. The guidelines are on our website MicroShade.

SOC 1.4.1 Daylight calculations	❤	MicroShade provides daylight calculation guidelines for a large variety of building simulation tools. The guidelines provide instructions to calculate a building's daylight, promoting health and well-being at work and home. **Guidelines:** Climate Studio, Light Stanza, Velux Daylight Visualizer, IES-VE, DIVA, Ladybug Tools. The guidelines are on our website MicroShade.
SOC 1.4.2 Color Reproduction of Daylight	❤	MicroShade online simulation tool (SimShade® SimShade). can provide a color rendering of daylight.
SOC 1.4.3 Glare	❤	MicroShade provides BSDF files for a large variety of glazing and shading systems. **Guidelines:** Daylight Guideline The guidelines are on our website MicroShade.
TEC 1.1 Fire Protection and Safety		The MicroShade® can contribute to fire protection and safety as the product does not contain PVC. More Information is found in our Declaration of content in documentation packages.
TEC 1.3 Quality of the building envelope	❤	The MicroShade® can contribute to the quality of the climate screen as the product does not change the U-Value of the window system.
TEC 1.5 Design for ease of maintenance and cleaning	❤	The MicroShade® is placed in the window construction and does not require special cleaning or maintenance.
TEC 1.6 Dismantling and recycling	**BONUS**	The MicroShade® do not complicate the dismantling and recycling process as MicroShade® is burned off in the recycling of the glass.
TEC 1.8 Documentation with environmental product declarations (EPD)		MicroShade provides an environmental product declaration. The EPD can be found in the documentation packages.

Contact information

If you want to know more about MicroShade:

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Address

MicroShade A/S, Ejby Industrivej 70, 2600 Glostrup, Denmark