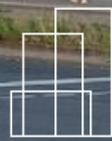


# MICROSHADE® IN DGNB-CERTIFIED CONSTRUCTION



 Micro  
Shade®

# Introduction to DGNB



**DGNB**, (Deutsche Gesellschaft für Nachhaltiges Bauen), 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 2018 DE, Languages: DE
- DGNB 2020 DE, Languages: DE

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.

<b>Bronze:</b>	35 % Total Performance -- % In each Quality
<b>Silver:</b>	50 % Total Performance 35 % In each Quality
<b>Gold:</b>	65 % Total Performance 50 % In each Quality
<b>Platin:</b>	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

The awards are DGNB Diamond and the DGNB Climate Positive Award. The DGNB Diamond is an architectural quality award. The DGNB Climate positive is awarded to buildings that are demonstrably operated in at least a climate-neutral manner based on their real consumption data and thus distinguishes buildings that are already making a positive contribution to the climate and energy transition through their operation.

## 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.

## DGNB – FOCUS POINTS

DGNB offers a series of focus points where an intensified focus is placed to enhance quality in building design. Bonus points are given within circular economy and SDGs if over fulfillment within a criterion. Furthermore, innovation can provide alternative points.

### Categories

- People as a focal point
- Circular Economy
- Design quality
- Sustainable Development Goals (SDGs)
- Climate Protection
- Innovation



# Overview of criteria\*

## DGNB 2020 DE

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

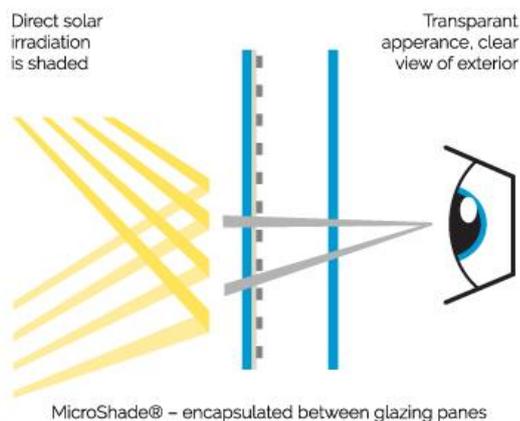
QUALITY	CRITERIA GROUP	CRITERIA NAME	CE/SDGs	
PROCESS QUALITY (PRO)	PLANNING QUALITY (PRO1)	<b>PRO 1.1</b> Comprehensive project brief		
		<b>PRO 1.4</b> Sustainability aspects in tender phase	<b>BONUS</b>	
		<b>PRO 1.5</b> Documentation for sustainable management		
		<b>PRO 1.6</b> Procedure for urban and design planning		
		<b>PRO 2.1</b> Construction site/construction process	<b>BONUS</b>	
	CONSTRUCTION QUALITY ASSURANCE (PRO2)	<b>PRO 2.2</b> Quality assurance of the construction		
		<b>PRO 2.3</b> Systematic commissioning		
		<b>PRO 2.4</b> User communication		
		<b>PRO 2.5</b> FM-compliant planning		
		ENVIRONMENTAL QUALITY (ENV)	EFFECTS ON THE GLOBAL AND LOCAL ENVIRONMENT (ENV1)	<b>ENV 1.1</b> Building life cycle assessment
<b>ENV 1.2</b> Local environmental impact				
<b>ENV 1.3</b> Sustainable resource extraction				
<b>ENV 2.2</b> Potable water demand and wastewater volume				
RESOURCE CONSUMPTION AND WASTE GENERATION (ENV2)	<b>ENV 2.3</b> Land use		<b>BONUS</b>	
	<b>ENV 2.4</b> Biodiversity at the site		<b>BONUS</b>	
	LIFE CYCLE COST (ECO1)		<b>ECO 1.1</b> Life cycle cost	<b>BONUS</b>
			ECONOMIC DEVELOPMENT (ECO2)	<b>ECO 2.1</b> Flexibility and Adaptability
	<b>ECO 2.2</b> Commercial viability	<b>BONUS</b>		
SOCIAL QUALITY (SOC)	HEALTH, COMFORT AND USER SATISFACTION (SOC1)	<b>SOC 1.1</b> Thermal comfort	<b>BONUS</b>	
		<b>SOC 1.2</b> Indoor air quality	<b>BONUS</b>	
		<b>SOC 1.3</b> Acoustic comfort	<b>BONUS</b>	
		<b>SOC 1.4</b> Visual comfort		
		<b>SOC 1.5</b> User Control		

		<b>SOC 1.6</b> Quality of outdoor spaces	
		<b>SOC 1.7</b> Safety and security	
	FUNCTIONALITY ( <b>SOC2</b> )	<b>SOC 2.1</b> Design for all	
		<b>TEC 1.1</b> Fire Safety	
		<b>TEC 1.2</b> Sound Insulation	
		<b>TEC 1.3</b> Quality of the building envelope	
TECHNICAL QUALITY ( <b>TEC</b> )	TECHNICAL QUALITY ( <b>TEC1</b> )	<b>TEC 1.4</b> Use and integration of building technology	<b>BONUS</b>
		<b>TEC 1.5</b> Ease of cleaning building components	
		<b>TEC 1.6</b> Ease of recovery and recycling	<b>BONUS</b>
		<b>TEC 1.7</b> Emissions control	
		<b>TEC 3.1</b> Mobility infrastructure	<b>BONUS</b>
		<b>SITE 1.1</b> Local environment	
		<b>SITE 1.2</b> Influence on the district	
THE QUALITY OF THE AREA ( <b>SITE</b> )	THE QUALITY OF THE AREA ( <b>SITE1</b> )	<b>SITE 1.3</b> Transport access	
		<b>SITE 1.4</b> Access to amenities	<b>BONUS</b>

# 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® 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 MicroShade's product in relation to other similar products, specifically assessing their environmental performance. The EPD serves as a transparent and trustworthy source of information, as it undergoes independent third-party verification, ensuring its reliability.

# 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

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 professionals 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.

[www.microshade.com](http://www.microshade.com)

- DGNB DE 2020 (DE/UK)
- DGNB DE 2018 (DE/[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 DE - certification of buildings

This list provides an overview of the criteria and the associated knowledge and product details offered by MicroShade in DGNB 2020 DE. It is important to note that the specific criteria in the DGNB may vary between versions.

CRITERIUM	What can MicroShade® do, and what do we provide?
<b>PRO 2.4</b> User communication	MicroShade provides a sustainability and technical user manual. More Information is in our technical user manual in the documentation packages.
<b>ENV 1.1</b> Building life cycle assessment	An EPD on the MicroShade® is available which offers an analysis of the environmental performance of our product. More Information is in our documentation packages.
<b>ENV 1.2</b> – Local environmental impact	The MicroShade® has no material to declare. More Information is in our Declaration of content in the documentation packages.
<b>ECO 1.1</b> Life cycle cost	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 ( <a href="#">SimShade</a> ).
<b>SOC 1.1</b> 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. <b>Guidelines:</b> <a href="#">IES-VE</a> , <a href="#">BE18</a> , <a href="#">IDA ICE</a> , <a href="#">Ladybug Tools</a> . The guidelines are on our website <a href="#">MicroShade</a> .
<b>SOC 1.4</b> Visual Comfort	<b>SOC 1.4.1 / 1.4.2</b> Availability of daylight for the entire building / permanent workstations  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. <b>Guidelines:</b> <a href="#">Climate Studio</a> , <a href="#">Light Stanza</a> , <a href="#">Velux Daylight Visualizer</a> , <a href="#">IES-VE</a> , <a href="#">DIVA</a> , <a href="#">Ladybug Tools</a> . The guidelines are on our website <a href="#">MicroShade</a> .

### **SOC 1.4.3** Visual contact with the outside

MicroShade® provides a superior view to the outside as the shading is passive and always allows visual contact to the outside.

### **SOC 1.4.4** Absence of glare in daylight

## **SOC 1.4** Visual Comfort

MicroShade® is not directly a glare protection shading device, however studies have proven that MicroShade® has a positive effect. Furthermore, can MicroShade A/S provide BSDF files for a large variety of glazing and shading systems to use in glare simulation.

**Guidelines:** [Daylight Guideline](#)

### **SOC 1.4.6** Daylight color rendering

MicroShade® provides excellent color rendering with RA>90. MicroShade provide an online simulation tool (SimShade® [SimShade](#)) where the color rendering of different window build up can be calculated.

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## **TEC 1.1** Fire 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.

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## **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.

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## **TEC 1.4** Use and integration of building technology

### **SOC 1.4.1** Passive systems

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.

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## **TEC 1.5** Ease of cleaning building components

The MicroShade® is placed in the window construction and does not require special cleaning or maintenance.

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## **TEC 1.6** Ease of recovery and recycling

The MicroShade® do not complicate the dismantling and recycling process as MicroShade® is burned off in the recycling of the glass.

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# Contact information MicroShade®

If you want to know more about MicroShade:

Visit [microshade.com](https://microshade.com)

Follow us on [LinkedIn](#).

Sign up for our newsletter on [MicroShade](#).

Try SimShade on [SimShade](#).

## **Address**

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