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ROMA quick-assembly insulating panel types P, M & D (core made of polyurethane) types FP, FP+, FV & FV+ (core made of mineral wool)

Environmental product information for DGNB building certification

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ROMA
DÄMM-SYSTEME

This document aims at the identification of linkages between environmental product information covered by EPDs and the requirements of the DGNB SYSTEM Version 2018 building certification. It provides an overview of product related features based on the specifications of the DGNB certification for new construction, including construction for office, education, residential, hotel, supermarket, shopping centre, commercial, logistics and production [DGNB System – Kriterienkatalog Gebäude Neubau, Version 2018, 7th edition]

.product description

Prefabricated double skin steel faced ROMA-sandwich panels with a core made of polyurethane (types P, M & D) or mineral wool (types FP, FP+, FV & FV+) for self-supporting and non-supporting application in roof, wall and ceiling structures. The profiled internal and external steel sheets are made of a core of steel, which is protected against corrosion with zinc and organic coatings. The core is linked to the profiled steel sheets on both sides in order to resist shear forces.

The elements are manufactured in a maximum width of 1150 mm and varying thickness up to 220 mm (polyurethane core) or 240 mm (mineral wool core). Flat and profiled sheets of steel are used as cover layers.

.application

Application as a component in roof, wall and ceiling constructions for mainly static loads.

Sandwich panels in wall and roof applications overtake tasks of the building physics, especially sound, heat and moisture safety. They perform the function of air tightness of the building envelope simultaneously.

. technical data

- Technical specifications for both types of sandwich panels are given in *DIN EN 14509*.
- The technical specifications for the core of **polyurethane (PU)** are given in *DIN EN 13165*.
- The technical specifications for the core of **mineral wool (MW)** are given in *DIN EN 13162*.
- Further general technical approvals for sandwich panels are released by the manufactures.
- The products are being delivered to the market with the appropriate CE mark and Declaration of Performance.

Sandwich element with a core made of	PU	MW	Unit
Density of insulation material (PU)	40	100 – 135	kg/m ³
Thickness of the element referring to the overall height of the element (D) in case of flat outer layers; referring to the consistent core thickness without profile (dc) in case of heavily profiled elements	30 – 220	60 – 240	mm
Thickness of the outer layer	0.6		mm
Thickness of the inner layer	0.5		mm
Calculation value for thermal conductivity of the insulation	0.022 – 0.023	0.042 – 0.046	W/(m.K)
Heat transfer coefficient of the total element including thermal bridges due to overlap and fixing elements	0.745 – 0.101	0.76 – 0.175	W/(m ² .K)

OVERVIEW OF RELEVANT DGNB-CRITERIA

Quality	Criteria group	Criterion	Topic
ENVIRONMENTAL QUALITY	Impacts on global and local environment	ENV1.1	Life cycle assessment of the building
		ENV1.2	Local environmental impact
		ENV1.3	Responsible procurement
ECONOMIC QUALITY	No relevant criteria		
SOCIAL & FUNCTIONAL QUALITY	No relevant criteria		
TECHNICAL QUALITY	Quality of technical design	TEC 1.2	Sound insulation
		TEC 1.3	Quality of building envelope
		TEC 1.5	Cleaning and maintenance
		TEC 1.6	Deconstruction and disassembly / recyclability
PROCESS QUALITY	No relevant criteria		
SITE QUALITY	No relevant criteria		

ENVIRONMENTAL QUALITY

This group of criteria evaluates the environmental performance of the building over its entire life cycle. With their aim to preserve environmental quality, ecological criteria assess both, impacts and emissions to air, water, and soil on a global and local scale as well as resource use and waste treatment.

DGNB CRITERION ENV1.1
LIFE CYCLE IMPACT ASSESSMENT OF THE BUILDING

.environmental product declaration (EPD)

Owner of the Declaration	Romakowski GmbH & Co. KG
Programme Holder & Publisher	Institut Bauen und Umwelt e.V. (IBU)
ECO-EPD at ECO Platform	yes
Author of the LCA	Daxner & Merl GmbH
Software & Database	GaBi software-system and database for life cycle engineering GaBi 8, database v8.7 [see documentation]
Third-party Verification	Completed; Type III declaration in compliance with <i>ISO 14025</i>
External verifier	Matthias Klingler
Declaration Number	PU: EPD-ROK-20180144-IBC1-EN (Sandwich panels with a core made of polyurethane) MW: EPD-ROK-20180145-IBC1-EN (Sandwich panels with a core made of mineral wool)
Issue date	26.11.2018
Valid to	25.11.2023
Declaration Type	Manufacturer's declaration of an average product according to <i>EN 15804+A1</i>
Declared Unit	1 m ² continuously produced sandwich panels with skins made of steel with a surface weight of 14.52 kg/m ² [core made of polyurethane (PU)] and 21.09 kg/m ² [core made of mineral wool (MW)] manufactured by ROMA Dämmsysteme in Buttenwiesen (Germany).
Conversion Factor to 1 kg	Sandwich panel with a core of polyurethane: 0.06887 Sandwich panel with a core of mineral wool: 0.04742
Variance of Thickness	The thickness of the steel layer is the same for all element types. As a result, the environmental impacts of the panels are dependent on the thickness of the insulation core and referring variations. The subsequent factors shown in table "variance of thickness" represent a simple approximation for the estimation of environmental impacts of sandwich panels with varying thicknesses. Nevertheless, these factors represent rough approximations and need to be used with caution.
Reference period	The reference service life depends on the location, weather conditions and the quality of coating. It thus ranges between 15 and 45 years.
End of life scenario	The end-of-life scenario assumes a recycling rate of 95 % for the steel parts (landfilling of 5 %). It reflects the recycled content of the product with recycling potentials given for referring net material flows for recycling. After dismantling, the thermal insulation core material of polyurethane is used for energy recovery. The given scenario for mineral wool refers to landfilling of the used material.

Life Cycle Assessment in the
planning phase, LCA optimisation

The EPD data are supporting the application of Life Cycle
Assessment as a planning and optimisation tool as suggested
in the DGNB system.

.results of the LCA – environmental impacts

Declared unit: 1 m ² Sandwich panel with a core made of polyurethane (14.52 kg)					
Declared life cycle stage		PRODUCT STAGE	WASTE TREATMENT	DISPOSAL	BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Indicator	Unit	A1-A3	C3	C4	D
GWP	kg CO ₂ -equ	3.49E+01	0.00E+00	9.68E+00	-1.68E+01
ODP	kg CFC11-equ	8.95E-08	0.00E+00	1.75E-13	7.21E-08
AP	kg SO ₂ -equ	9.63E-02	0.00E+00	3.92E-03	-3.16E-02
EP	kg (PO ₄) ³⁻ -equ	1.12E-02	0.00E+00	9.88E-04	-2.58E-03
POCP	kg Ethen-equ	1.57E-02	0.00E+00	2.49E-04	-6.48E-03
ADP elements	kg Sb-equ	1.63E-03	0.00E+00	3.20E-08	-4.07E-05
ADP fossil	MJ	5.66E+02	0.00E+00	2.58E+00	-1.79E+02

Declared unit: 1 m ² Sandwich panel with a core made of mineral wool (21.09 kg)					
Declared life cycle stage		PRODUCT STAGE	WASTE TREATMENT	DISPOSAL	BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Indicator	Unit	A1-A3	C3	C4	D
GWP	kg CO ₂ -equ	4.69E+01	0.00E+00	1.99E-01	-1.29E+01
ODP	kg CFC11-equ	2.43E-10	0.00E+00	4.59E-14	7.21E-08
AP	kg SO ₂ -equ	1.56E-01	0.00E+00	1.09E-03	-2.55E-02
EP	kg (PO ₄) ³⁻ -equ	1.65E-02	0.00E+00	1.49E-04	-1.89E-03
POCP	kg Ethen-equ	1.57E-02	0.00E+00	8.63E-05	-5.97E-03
ADP elements	kg Sb-equ	1.67E-03	0.00E+00	2.66E-08	-3.97E-05
ADP fossil	MJ	5.72E+02	0.00E+00	2.60E+00	-1.25E+02

Caption

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

Variance of thickness:

Impact category	Factors for polyurethane	Factors for mineral wool	
ADPf =	+/- 1.99E+01	+/- 1.15E+01	per 10 mm thickness
ADPnf =	+/- 3.96E-07	+/- 2.73E-07	per 10 mm thickness
AP =	+/- 1.49E-03	+/- 6.32E-03	per 10 mm thickness
EP =	+/- 2.82E-04	+/- 7.05E-04	per 10 mm thickness
GWP =	+/- 5.60E-01	+/- 1.32E+00	per 10 mm thickness
ODP =	+/- 7.52E-09	+/- 1.69E-12	per 10 mm thickness
POCP =	+/- 2.16E-04	+/- 3.13E-04	per 10 mm thickness
PENRT =	+/- 2.00E+01	+/- 1.23E+01	per 10 mm thickness
PERT =	+/- 1.47E+00	+/- 1.90E+00	per 10 mm thickness

.results of the LCA – resource use

Declared unit: 1 m ² Sandwich panel with a core made of polyurethane (14.52 kg)					
Declared life cycle stage		PRODUCT STAGE	WASTE TREATMENT	DISPOSAL	BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Indicator	Unit	A1-A3	C3	C4	D
PERE	MJ	2.08E+01	0.00E+00	3.32E-01	-4.96E+00
PERM	MJ	4.76E+01	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	6.84E+01	0.00E+00	3.32E-01	-4.96E+00
PENRE	MJ	5.06E+02	0.00E+00	1.14E+02	-1.89E+02
PENRM	MJ	1.36E+02	0.00E+00	-1.11E+02	0.00E+00
PENRT	MJ	6.42E+02	0.00E+00	2.89E+00	-1.89E+02
SM	kg	1.59E+00	0.00E+00	0.00E+00	8.04E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	1.11E+02	0.00E+00
FW	m ³	9.62E-02	0.00E+00	2.24E-02	-7.58E-04

Declared unit: 1 m ² Sandwich panel with a core made of mineral wool (21.09 kg)					
Declared life cycle stage		PRODUCT STAGE	WASTE TREATMENT	DISPOSAL	BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Indicator	Unit	A1-A3	C3	C4	D
PERE	MJ	3.68E+01	0.00E+00	3.16E-01	8.32E+00
PERM	MJ	4.15E+01	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	7.83E+01	0.00E+00	3.16E-01	8.32E+00
PENRE	MJ	6.04E+02	0.00E+00	2.70E+00	-1.21E+02
PENRM	MJ	5.64E+01	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	6.60E+02	0.00E+00	2.70E+00	-1.21E+02
SM	kg	1.59E+00	0.00E+00	0.00E+00	8.04E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	9.70E-02	0.00E+00	4.46E-04	1.73E-02

Caption

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

.results of the LCA – output flows

Declared unit: 1 m ² Sandwich panel with a core made of polyurethane (14.52 kg)					
Declared life cycle stage		PRODUCT STAGE	WASTE TREATMENT	DISPOSAL	BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Indicator	Unit	A1-A3	C3	C4	D
HWD	kg	1.82E-03	0.00E+00	3.22E-09	-8.48E-06
NHWD	kg	6.05E-01	0.00E+00	5.18E-01	1.36E+00
RWD	kg	5.97E-03	0.00E+00	1.24E-04	-5.83E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	1.01E+01	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	1.66E+01	0.00E+00
EET	MJ	0.00E+00	0.00E+00	2.97E+01	0.00E+00

Declared unit: 1 m ² Sandwich panel with a core made of mineral wool (21.09 kg)					
Declared life cycle stage		PRODUCT STAGE	WASTE TREATMENT	DISPOSAL	BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Indicator	Unit	A1-A3	C3	C4	D
HWD	kg	1.71E-03	0.00E+00	4.22E-08	-8.45E-06
NHWD	kg	1.21E+00	0.00E+00	1.15E+01	1.39E+00
RWD	kg	9.92E-03	0.00E+00	3.89E-05	4.16E-06
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	1.01E+01	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Caption

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy, electric energy, EET = Exported energy, thermal energy

DGNB CRITERION ENV1.2
LOCAL ENVIRONMENTAL IMPACT

ROMA quick-assembly insulating panels produced in Bittenwiesen (Germany) comply with the REACH Directive of the European Chemicals Agency (ECHA) as stated in chapter 2.5 of the environmental product declaration. For more information, please visit www.romakowski.com.

The subsequent table illustrates those criteria of the DGNB criteria matrix relevant for double skin steel faced ROMA-sandwich panels with a core made of polyurethane:

No.	Building material relevant for this criterion	Area of application	Relevant aspect	Quality level	Explanation	Scope
19	Non-load-bearing metal components like banisters, metal substructures, doorframes, steel doors, facade elements, heat and cooling transfer surfaces, pipes for cooling (on site and at factory)	Anti-corrosive and effect coatings (e.g. metallic effect lacquers)	VOC	Quality level 4	At factory: Compliance regulated under legal permit of the production facility; treatment of exhaust air in place [EU-regulation 1999/13/EU; 2010/75/EU - Industrial Emissions Directive ¹] Depending on the application the correct coating shall be checked with ROMA.	At factory and construction site
33	Coated metal components - not relevant for ROMA sandwich panels	Primer and final coating	Chrome VI	-	Zinc Z 275, therefore not relevant according to DGNB criteria catalogue (galvanised and organically coated)	
34	Roof covering, gutters, downpipes	Water bearing components: roof and rainwater drainage	Lead, cadmium, zinc	Quality level 4	Potential zinc erosion could only result from cutting edges and lies under the limits of determination. The organic coating is protecting the zinc layer. Depending on the application the correct coating shall be checked with ROMA.	
40	Plastic foam insulation for building and building technical equipment (building services)	PS / XPS / PUR-insulation products, flexible technical equipment insulation (caoutchouc and PE)	Halogenated blowing agents	Quality level 4	Propellant based on pentane, no halogenated propellants	All components relevant to EnEV ² . Avoidance of potent greenhouse gases

Note: Since 22 March 2016, products (substances, mixtures and commodities) containing more than 100 mg/kg HBCD may no longer be manufactured or placed on the market in the EU (Regulation (EC) No 850/2004 on persistent organic pollutants), therefore not relevant.

¹ According to 2010/75/EU (German: Industrieemissionsrichtlinie), the limit value for fugitive VOC emissions in existing installations for coil coatings is set at 10% of the solvents used. Thus, the limit values for quality level 4 are undercut in any case due to the applicable legal regulation.

² Energy Saving Ordinance (German: Energieeinsparverordnung (EnEV)) was replaced by the Building Energy Act (German: Gebäudeenergiegesetz) on November 1st 2020.

The subsequent table illustrates those criteria of the DGNB criteria matrix relevant for double skin steel faced ROMA-sandwich panels with a core made of **mineral wool**:

No.	Building material relevant for this criterion	Area of application	Relevant aspect	Quality level	Explanation	Scope
19	Non-load-bearing metal components like banisters, metal substructures, doorframes, steel doors, facade elements, heat and cooling transfer surfaces, pipes for cooling (on site and at factory)	Anti-corrosive and effect coatings (e.g. metallic effect lacquers)	VOC	Quality level 4	At factory: Compliance regulated under legal permit of the production facility; treatment of exhaust air in place [EU-regulation 1999/13/EU; 2010/75/EU - Industrial Emissions Directive ³] Depending on the application the correct coating shall be checked with ROMA.	At factory and construction site
33	Coated metal components - not relevant for ROMA sandwich panels	Primer and final coating	Chrome VI	-	Zinc Z 275, therefore not relevant according to DGNB criteria catalogue (galvanised and organically coated)	
34	Roof covering, gutters, downpipes	Water bearing components: roof and rainwater drainage	Lead, cadmium, zinc	Quality level 4	Potential zinc erosion could only result from cutting edges and lies under the limits of determination. The organic coating is protecting the zinc layer. Depending on the application the correct coating shall be checked with ROMA.	

³ According to 2010/75/EU (German: Industrieemissionsrichtlinie), the limit value for fugitive VOC emissions in existing installations for coil coatings is set at 10% of the solvents used. Thus, the limit values for quality level 4 are undercut in any case due to the applicable legal regulation.

DGNB CRITERION ENV1.3 RESPONSIBLE PROCUREMENT

The goal of the criterion is to encourage the use of products in the building which are responsibly sourced and comply with environmental and social standards over the whole value chain in a transparent manner.

General information for the calculation of the contribution of ROMA double-skin steel faced sandwich panels to ENV1.3:

Material group	[kg]	Metals (mass)
Significance threshold of consideration (materials below the threshold are not considered in criterion ENV1.3)	[€]	0.5 % proportion of material costs related to total costs of cost group 300 (building construction) and cost group 500 (outdoor facilities and open spaces) acc. to <i>DIN 276</i>
Recycled content PU-element (steel)	11 [m%]	Supplier dependent, value may vary
Recycled content MW-element (steel)	7.5 [m%]	
of which		
pre-consumer recycled content	n.a. %	Supplier dependent
post-consumer recycled content	n.a. %	Supplier dependent

Quality level of ROMA double-skin steel faced sandwich panels with a core made of polyurethane or mineral wool. The project specific evaluation depends on the total amount of sandwich panels used in the building in relation to the total amount of building products used in the building:

Indicator 1: responsible sourcing of raw materials	Document/source of verification
Quality level 1.1: yes	Third-party verified corporate sustainability report (CSR): yes ⁴
For quality level 1.2 or 1.3 “certified sourcing according to DGNB list of standards”: no, but third-party verified standard acc. to BRE: BES 6001 Responsible Sourcing [BRE Global 2020]	BES 6001: Issue 3.1, Framework Standard for Responsible Sourcing. Certificate of Approval, Certificate Number: RS0053, Issue: 02. Expiry Date: 27 th May 2023 Performance rating: Very Good Certification body: BRE Global ⁵ . The standard includes requirements for corporate management, supply chain and sustainability with a special focus on responsible material sourcing for ROMA sandwich panels.
Indicator 2. secondary raw materials	Document/source of verification
Quality level 2.1: yes	According to recycled content (see above)
For quality level 2.2 “certified secondary raw material according to DGNB list of standards”: no	

⁴ https://www.romakowski.com/files/userdata/roma-daemssysteme_DE/downloads/zertifikate-umwelt/Nachhaltigkeitsbericht.pdf

⁵ <http://www.greenbooklive.com/pdfdocs/respsourcing/RS0053.pdf>

TECHNICAL QUALITY

This group of criteria evaluates the technical performance of the building. Relevant criteria for ROMA double-skin steel faced sandwich panels with a core made of polyurethane or mineral wool analyse potential reductions when it comes to cleaning and maintenance as well as recycling potentials of used materials to minimise resource consumption.

DGNB CRITERION TEC1.2 SOUND INSULATION

The values referring to sound insulation are available for ROMA sandwich panels. Depending on the used panel type, airborne sound reduction R_w (C, Ctr) according to *EN ISO 140-3* lies between 26 dB for panels with a core mad of polyurethane and 34 dB for panels with a core made of mineral wool. For project specific information, please contact ROMA directly (www.romakowski.com).

DGNB CRITERION TEC1.3 QUALITY OF BUILDING ENVELOPE

Heat transfer coefficient (opaque exterior component) is depending on the thickness of the insulation layer. The following table presents the constructional data for a core of polyurethane or mineral wool:

Sandwich element with a core of	PU	MW	Unit
Density of insulation material	40	100 – 135	kg/m ³
Thickness of the element: When the outer layers are flat, this is the overall height of the element (D); on heavily profiled elements this is the consistent core thickness without profile (dc)	30 – 220	60 – 240	mm
Thickness of the outer layer		0.6	mm
Thickness of the inner layer		0.5	mm
Calculation value for thermal conductivity of the insulation	0.022 – 0.023	0.042 – 0.046	W/(m.K)

For project specific information, please contact ROMA directly (www.romakowski.com).

DGNB CRITERION TEC1.5 CLEANING AND MAINTENANCE

ROMA sandwich panels do not require any special treatment throughout their service life. The usual maintenance practices for outer shells made of metal products apply.

ROMA provides technical data sheets (product data sheets). This information can be obtained on the Internet at www.romakowski.com.

DGNB CRITERION TEC1.6 DECONSTRUCTION AND DISASSEMBLY / RECYCLABILITY

ROMA double-skin steel faced sandwich panels with a core made of polyurethane or mineral wool represent building components of various cost groups according to *DIN 276* and thus are part of the DGNB criterion deconstruction and disassembly.

Recyclability

ROMA quick-assembly insulating panels represent a component which can be reused as a comparable product or as a valuable secondary material. Prerequisite is proper handling as stated in chapters 2.8, 2.9 and 2.14 of the Environmental Product Declaration, which can minimise construction waste. The undamaged sandwich panels can be re-used (after dismantlement) particularly on buildings or applications with less demanding applications, where aesthetics is not vitally important. The separability of the steel layer and the insulating layer (polyurethane or mineral wool) is very easy and can be executed manually. The cover sheets of the sandwich panels can be detached from the core and collected, reused or recycled as secondary material in the steel industry after dismantling. The core of polyurethane is used for energy recovery. The recycling of the mineral wool core is potentially possible. If appropriate recycling facilities do not exist, the mineral wool is landfilled. Careful planning limits off-cuts on the construction site to a minimum. Cuttings shall be treated as described in EPD chapter 2.14. ROMA takes back panels from building sites (cuttings, residuals) when the customer pays the resulting disposal costs.

Thus, ROMA sandwich panels may potentially contribute to the circular economy bonus.

Building construction for ability of deconstruction

Ease of disassembly of ROMA quick-assembly insulating panels strongly depends on its application and the building's construction. In general, non-destructive dismantling of the sandwich panels is possible. It is possible to re-use components or to separate the steel layer from the insulating layer (polyurethane or mineral wool) for further recycling in the steel industry or for energy recovery.

The information provided in chapter 2.14 of the EPD can be used in early design phases as well as in detailed design to increase the resource efficiency.

Disclaimer: The content of, and results shown in this fact sheet are based on data and information submitted by the client. Therefore, Daxner & Merl GmbH makes no representation or warranty in regard of the correctness or completeness of the content of this document, or the results shown.

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