Certification Document

Manufacturer:	Romakowski GmbH & Co. KG Herdweg 31 86647 Buttenwiesen Germany
Production plant:	Romakowski GmbH & Co. KG Herdweg 31 86647 Buttenwiesen Germany
Panel Types:	P-St, M-St and D-St with steel faces and polyurethane core material
Date of issue:	14-10-2019
Date of expiry:	14-10-2025
Certification Number:	09-01-01-01-0053

The Quality Label EPAQ shall be used only in combination with this certification number.

This Certification Document consists of 9 pages.

This Certification Document is only valid in combination with the valid accompanying Quality Certificate. The Quality Certificate is awarded only after the first External Quality Control (EQC), if the requirements of this Certification Document are fulfilled.

Europark Fichtenhain A 13 a • 47807 Krefeld • Telephone: +49 2151 93630-0 • Fax: +49 2151 93630-29 • E-mail: info@epaq.eu

1 GENERAL

This Certification Document (CD) specifies all characteristics of panel types P-St, M-St and D-St, which must be declared according to EN 14509. Additionally to the requirements of EN 14509, ZA2 for the mechanical resistance and thermal performance, the EPAQ system A applies. All reports of the initial inspection and continuous surveillance have to be sent also to the association.

2 SANDWICH PANEL TYPES AND DEFINITION OF USED MATERIALS

2.1 Panel types

The sandwich panel types P-St, M-St and D-St consist of polyurethane (PUR) core material in between steel faces, with a panel width of 1000 mm for panel types M-St and D-St and 1150 mm for panel type P-St. The panel thicknesses are stated in Table 3. The geometry of the panels is displayed in figures 1 to 3. The dimensions of the panels shall be within the tolerances given in EN 14509, annex D, in the Quality Regulations for Panels and Profiles of PPA-Europe, table 2.3 and in the figures 1 to 3 of this CD. The outer and inner faces are made of steel sheets with nominal thicknesses as indicated in Table 1.

The sandwich panels are intended to be used as self-supporting panels in external walls. The sandwich panels type D-St are also intended to be used as self-supporting panels in roofs.

2.2 Characteristics and composition

2.2.1 Faces

For the faces, organic coated galvanised steel S 320 GD according to EN 10346 has to be used. The protective coating systems shall be selected according to their durability in the application environment. The agreed characteristics in EN 10169 for the organic coating and in EN 10346 for the metallic coating shall be fulfilled. The faces shall have backside coating according to EN 14509. The thickness of the steel sheets for the faces has to be within the special tolerances given in EN 10143.

2.2.2 Core material

The polyurethane core type ROMA 5 has to fulfil the requirements of EN 13165 and to correspond to the values in the product data sheet. The blowing agent is pentane. The values given in this CD are only valid for the foam formulation on which the Type Testing was performed. The declared value of the thermal conductivity is $\lambda_{declared}$ = 0,022 W/(mK) for core type ROMA 5.

The core shall fulfil the reaction to fire requirements of class A to E (not F) according EN 13501-1.

2.2.3 Sandwich panels

The sandwich panels consist of a core according to chapter 2.2.2 and faces according to chapter 2.2.1. The core material has to fulfil the requirements of the production control according to table 4. The sandwich panels have to be produced on a continuous line.

The mass of the panels can be calculated by using the nominal density of the core according to table 4 and of the steel faces by using a weight of 80 kN/m³.

The thermal transmittance $U_{d,s}$-values shown in table 3 are based on the design value of the thermal conductivity $\lambda_{design} = 1,0 * \lambda_{declared}$.

3 MATERIAL SAFETY FACTORS AND WRINKLING STRESSES

For design procedure of EN 14509, annex E, the material safety factors for the ultimate limit state and for the serviceability limit state shall be used according to table 5 and the wrinkling stresses according to tables 7 and 8, unless national requirements are given. The long term shear values are given in table 6.

4 BENDING MOMENT CAPACITY

The bending moment capacity shall be calculated by the help of EN 14509, annex E, tables E.10.1 and E.10.2.

For bending moment capacities, no values are given, because these values are not needed in any case for the design according to the normative Annex E of EN 14509. Bending moment capacities on the basis of full scale tests are dependent on the span and the static systems without any effects due to temperature and creeping. A design with these values is therefore not possible on the stage of the valid EN 14509.

Europark Fichtenhain A 13 a • 47807 Krefeld • Telephone: +49 2151 93630-0 • Fax: +49 2151 93630-29 • E-mail: info@epaq.eu

5 REACTION TO FIRE AND EXTERNAL FIRE PERFORMANCE

Table 1: Reaction to fire and B_{Roof} classification of the sandwich panels with core material ROMA 5

Product	Panel thickness D [mm]	Sheet thickness [mm]		Classification		Remarks
		inner face	outer face	inside	outside	
"P-St"	≥ 60	0,50 – 1,00	0,50 – 1,00	B-s2, d0	B-s2, d0	-
"M-St"	≥ 60	0,50 – 1,00	0,60 – 1,0	B-s2, d0	B-s2, d0	-
"D-St"	≥ 72	0,50 – 1,00	0,60 – 1,0	B-s2, d0	B_{Roof}(t1)	$d_c \geq 30$mm

Table 2: Valid field of application for the classification given in table 1

Parameter	Valid field of application
Metal facings	
Grade of metal	All grades of steel
Profile geometry of inside facing, flat or light profiling up to 5 mm	Valid for flat or light profiling
Surface coating – tested face –PCS	Valid for all coatings with PCS-value in the range 0 to 4 MJ/m²
Colour of coating	Valid for all colours
Joint design	
Joint Types I to VIII	Valid for: joint types IV, V and VI and similar with the metal overlapping tongue on the internal face ≥15mm
Seals and gaskets (integral with panel)	Not valid
PUR insulating core	
Chemical composition	Foam system ROMA 5
Density [kg/m³]	40 – 46 kg/m³
Application	
Orientation of panels, vertical or horizontal application of sandwich panels	Valid for vertically and horizontally installed panels and ceiling application
Metal corner flashings	External and/or internal flashing of steel, minimum dimensions 50x50x0,50mm with coatings with PCS-value in the range 0 to 4 MJ/m²
Plastic corner flashings	Not valid for plastic corner flashings
Fixings for metal flashings	Valid for fixing spacing of 400 mm or less
Seals which are applied in end use but not part of the manufactured panel	Not valid for seals which are applied in end use but not part of the manufactured panel

Europark Fichtenhain A 13 a • 47807 Krefeld • Telephone: +49 2151 93630-0 • Fax: +49 2151 93630-29 • E-mail: info@epaq.eu

6 FIRE RESISTANCE

NPD

7 WATER PERMEABILITY

NPD

8 AIR PERMEABILITY

NPD

9 WATER VAPOUR PERMEABILITY

The sandwich panel types P-St, M-St and D-St are considered to be impermeable to water vapour.

10 AIRBORNE SOUND PERMEABILITY

NPD

11 SOUND ABSORPTION

NPD

12 WALKABILITY

NPD

13 THERMAL INSULATION PERFORMANCE

Table 3: Thermal transmittance $U_{d,S}$ (W/m²K)

Panel type	Overall thickness D [mm]	Core thickness d_C [mm]	$U_{d,S}$ including f_{joint} [W/m²K]
P-St	60	60	0,388
	80	80	0,285
	100	100	0,226
	120	120	0,187
	140	140	0,160
	170	170	0,131
	200	200	0,111
	220	220	0,101
M-St	60	60	0,448
	80	80	0,300
	100	100	0,234
	120	120	0,192
	140	140	0,163
	170	170	0,133
D-St	72	30	0,717
	82	40	0,542
	102	60	0,363
	122	80	0,273
	142	100	0,219
	162	120	0,183
	182	140	0,157

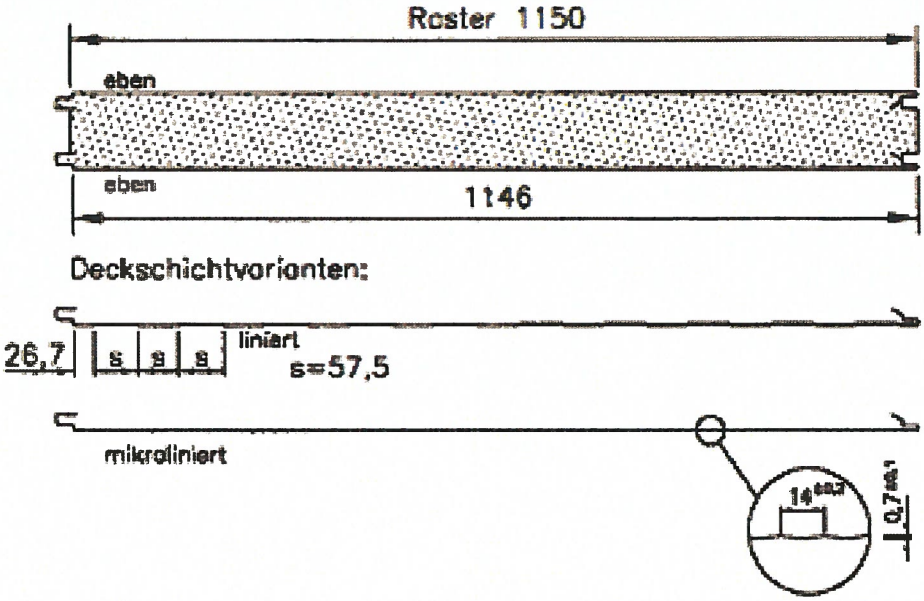

Figure 1: Cross-section of panel type P-St

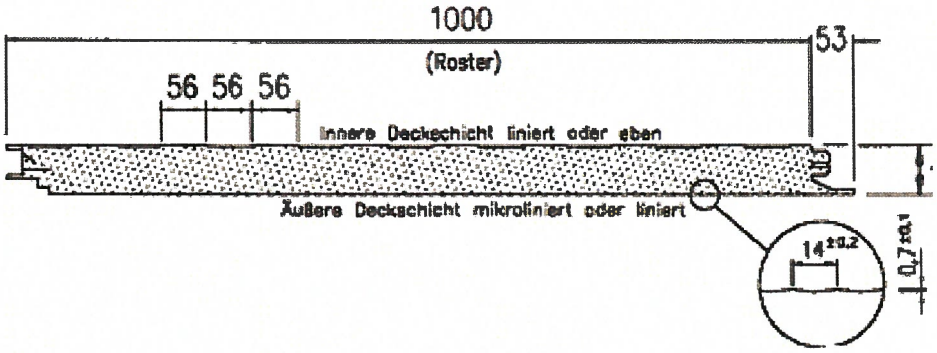

Figure 2: Cross-section of panel type M-St

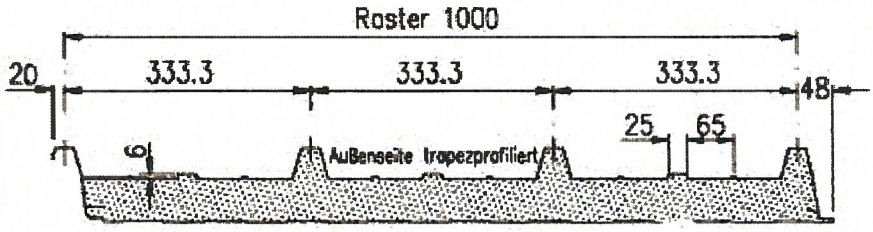

Figure 3: Cross-section of panel type D-St

Table 4: Requirements for the production control of the core material ROMA 5 with faces (mechanical values)[1]

Characteristic	Unit	Requirements for panels with core thickness [mm]:					
		30	40	80	140	200	220
Density of the PU core	kg/m^3	45^{+1}_{-5}					
Shear modulus G_C mean value 5%-fractile value	 MPa MPa	 3,2 2,7	 3,9 3,4	 3,6 3,2	 3,3 2,8	 2,7 2,2	 2,5 2,2
Shear strength f_C	MPa	0,13	0,13	0,11	0,08	0,06	0,06
E-modulus E_C[2] mean value 5%-fractile value	 MPa MPa	 1,9 1,4	 3,1 2,5	 3,7 3,2	 3,3 2,4	 3,2 2,3	 3,2 2,3
Compressive strength f_{Cc}	MPa	0,09	0,10	0,10	0,10	0,10	0,10
Cross panel tensile strength f_{Ct}	MPa	0,08	0,08	0,08	0,08	0,08	0,08

1 Values for intermediate thicknesses can be interpolated.

2 The stated values are mean values of the mean compressive and cross panel tensile moduli:

$$E_C = \frac{E_{Cc} + E_{Ct}}{2}$$

Table 5: Material safety factors γ_M for sandwich panels with core material ROMA 5

Property to which γ_M applies	Limit state	
	Ultimate limit state	Serviceability state
Yielding of a face	1,10	1,00
Wrinkling of a face in the span and at an intermediate support	1,12	1,02
Shear of the core	1,30	1,08
Shear failure of a profiled face	1,10	1,00
Crushing of the core	1,30	1,08
Support reaction capacity of a profiled face	1,10	1,00

Europark Fichtenhain A 13 a • 47807 Krefeld • Telephone: +49 2151 93630-0 • Fax: +49 2151 93630-29 • E-mail: info@epaq.eu

Table 6: Long term shear values for core material ROMA 5

Core thickness [mm]	Long term shear strength: f_C [MPa]	Creep coefficient φ_t t = 2000 h	Creep coefficient φ_t t = 100000 h
30 to 40	0,06	1,8	7,0
80	0,05	1,8	7,0
140	0,03	1,8	7,0
200 to 220	0,03	1,8	7,0

Table 7: Wrinkling stresses for external faces, $t_N \leq 0{,}60$ mm[1], for core material ROMA 5

Geometry of the face	Panel thickness D [mm]	Wrinkling stress [MPa]			
		in span	in span, elevated temperature	at central support	at central support, elevated temperature
Flat	60	70	66	56	53
	80	71	67	57	54
	100	69	65	55	52
	120	67	63	54	51
	140	66	62	53	50
	170	64	60	51	48
	200	61	57	49	46
	220	59	55	48	45
Lightly profiled	60	153	144	122	115
	80	155	146	124	117
	100	152	143	121	114
	120	148	139	119	112
	140	145	136	116	109
	170	140	132	112	105
	200	134	126	107	101
	220	130	122	104	98
Micro-profiled	60	142	133	114	107
	80	142	133	114	107
	100	142	133	114	107
	120	144	135	115	108
	140	146	137	117	110
	170	148	139	118	111
	200	151	142	121	114
	220	146	138	117	111
Profiled	72 to 162	320	320	320	320
	182	274	274	274	274

[1] Reduction factors for the wrinkling stresses for face thicknesses $t_N > 0{,}60$ mm:

Geometry of the face	0,75 mm	0,88 mm	1,0 mm
Flat	1	1	1
Lightly profiled and micro-profiled	0,87	0,79	0,74

Europark Fichtenhain A 13 a • 47807 Krefeld • Telephone: +49 2151 93630-0 • Fax: +49 2151 93630-29 • E-mail: info@epaq.eu

Table 8: Wrinkling stresses for internal faces, $t_N \leq 0{,}60$ mm[1], for core material ROMA 5

Geometry of the face	Panel thickness D [mm]	Wrinkling stress [MPa]	
		in span	at central support
Flat	60	70	63
	80	71	64
	100	69	62
	120	67	61
	140	66	59
	170	64	57
	200	61	55
	220	59	53
Lightly profiled (panel type P-St and M-St)	60	153	138
	80	155	140
	100	152	137
	120	148	134
	140	145	130
	170	140	126
	200	134	121
	220	130	117
Lightly profiled (panel type D-St)	72	155	140
	82	151	136
	102	154	138
	122	154	138
	142	150	135
	162	148	134
	182	145	130

[1] Reduction factors for the wrinkling stresses for face thicknesses **$t_N > 0{,}60$ mm**:

Geometry of the face	0,75 mm	0,88 mm	1,0 mm
Flat	1	1	1
Lightly profiled	0,87	0,79	0,74

Liability

The "European Association for Panels and Profiles" (PPA-Europe) located in Krefeld/Germany certifies and monitors at the wish of the manufacturers the sandwich panels and profiled sheets produced by them and awards the "EPAQ Quality Label" after successful certification.

In doing this, PPA-Europe and its representatives take the statutory regulations and the trust of end users in the certified products very seriously and make use of external experts for the substantive and technical examination of the construction products whose test results are checked once more by PPA-Europe. The same applies for the subsequent monitoring by PPA-Europe.

Nevertheless, it is possible that individual products unintentionally do not fully comply with the high level of quality and may lead to damage to the construction. If, in such a case, a claim is made on the manufacturer due to faulty quality or faulty delivery of the construction products, claims of recourse for this reason on PPA-Europe or its representatives may only be invoked in cases of intentional or grossly negligent behaviour during the certification or monitoring.

The certification and subsequent monitoring executed by PPA-Europe and its representatives does not affect the obligation of the manufacturer for a proper and constant level of quality and standard of the products.

With the exemption of intentional or grossly negligent action on the part of PPA-Europe and its representatives, we are only liable for the direct damage to the construction caused by the faulty product; all further subsequent damages are excluded.

.....

Chairman of the Quality Committee for Panels