DECLARATION OF PERFORMANCE

NO. MW/PW/421-002/CPR/DOP

1. PRODUCT-TYPE:
Metsä Wood Spruce MouldGuard structural spruce plywood
- Treated against mould growth
- Phenol-formaldehyde adhesive (exterior gluing quality)

2. INTENDED USES:
Structural elements in internal or external applications in construction

EN 636-2 S
- for internal structural use in dry conditions
- for internal or protected external structural use in humid conditions

3. MANUFACTURER:
Metsäliitto Cooperative
Metsä Wood
Revontulenpuisto 2 A
FI-02100 Espoo, Finland
Tel. +358 10 4605
www.metsawood.com

5. SYSTEM OF ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE:
AVCP System 2+

6a. HARMONISED STANDARD:
EN 13986:2004+A1:2015

Notified body:
Eurofins Expert Services Oy, Notified product certification body No. 0809

Certificate of conformity of the factory production control:
0809 – CPR – 1003

7. DECLARED PERFORMANCES

ESSENTIAL CHARACTERISTICS		PERFORMANCE								
		Sanded Metsä Wood spruce plywood								
		Nominal thickness (mm)								
Strength and stiffness for structural use:		9	12	12	15	18	21	24	27	30
		Number of plies								
		3	4	5	5	6	7	8	9	10
Characteristic bending strength (N/mm^2)	II	22,9	20,6	25,6	23,1	21,5	20,7	20,5	19,4	18,9
	⊥	3,0	6,5	8,1	11,1	12,3	12,7	12,4	13,4	13,7
Mean modulus of elasticity in bending (N/mm^2)	II	9178	8237	10235	9237	8615	8277	8205	7752	7558
	⊥	422	1363	1765	2763	3385	3723	3795	4248	4442
Characteristic compression strength (N/mm^2)	II	15,5	11,5	21,1	17,6	19,7	16,8	22,3	16,4	17,8
	⊥	8,5	12,5	8,9	12,4	10,3	13,2	7,7	13,6	12,2
Characteristic tension strength (N/mm^2)	II	9,3	6,9	12,6	10,6	11,8	10,1	13,4	9,8	10,7
	⊥	5,1	7,5	5,4	7,4	6,2	7,9	4,6	8,2	7,3
Mean modulus of elasticity in comp./tension (N/mm^2)	II	6212	4591	8430	7034	7886	6732	8936	6566	7119
	⊥	3388	5009	3570	4966	4114	5268	3064	5434	4881
Characteristic panel shear strength (N/mm^2)	II	3,5								
	⊥	3,5								
Mean modulus of rigidity in panel shear (N/mm^2)	II	350								
	⊥	350								
Characteristic planar shear strength (N/mm^2)	II	1,42	0,94	1,58	1,63	1,76	1,41	2,15	1,46	1,50
	⊥	NPD	NPD	0,81	0,87	0,64	1,18	0,39	1,12	0,72
Mean modulus of rigidity in planar shear (N/mm^2)	II	45,1	35,5	66,1	50,5	71,4	51,8	142,9	52,1	63,2
	⊥	NPD	NPD	20,9	29,1	24,9	37,4	24,6	41,3	35,2

II = along the face veneer grain direction
⊥ = across the face veneer grain direction
The material values in this DoP are to be used for structural calculations with EN 1995 (Eurocode 5).

ESSENTIAL CHARACTERISTICS		PERFORMANCE								
		Unsanded Metsä Wood spruce plywood								
		Nominal thickness (mm)								
Strength and stiffness for structural use:		9	12	12	15	18	21	24	27	30
		Number of plies								
		3	4	5	5	6	7	8	9	10
Characteristic bending strength (N/mm^2)	II	23,1	21,0	26,1	23,8	22,2	21,3	21,1	20,0	19,4
	⊥	2,7	6,0	7,5	10,4	11,7	12,1	11,9	12,9	13,2
Mean modulus of elasticity in bending (N/mm^2)	II	9244	8400	10437	9504	8889	8536	8438	7984	7776
	⊥	356	1200	1563	2496	3111	3464	3563	4016	4224
Characteristic compression strength (N/mm^2)	II	16,0	12,0	21,4	18,0	20,0	17,1	22,5	16,7	18,0
	⊥	8,0	12,0	8,6	12,0	10,0	12,9	7,5	13,3	12,0
Characteristic tension strength (N/mm^2)	II	9,6	7,2	12,9	10,8	12,0	10,3	13,5	10,0	10,8
	⊥	4,8	7,2	5,1	7,2	6,0	7,7	4,5	8,0	7,2
Mean modulus of elasticity in comp./tension (N/mm^2)	II	6400	4800	8571	7200	8000	6857	9000	6667	7200
	⊥	3200	4800	3429	4800	4000	5143	3000	5333	4800
Characteristic panel shear strength (N/mm^2)	II	3,5								
	⊥	3,5								
Mean modulus of rigidity in panel shear (N/mm^2)	II	350								
	⊥	350								
Characteristic planar shear strength (N/mm^2)	II	1,41	0,93	1,56	1,61	1,73	1,42	2,09	1,46	1,50
	⊥	NPD	NPD	0,78	0,85	0,62	1,15	0,38	1,10	0,70
Mean modulus of rigidity in planar shear (N/mm^2)	II	46,9	36,3	67,1	51,0	71,1	52,1	137,8	52,4	63,2
	⊥	NPD	NPD	20,0	28,2	24,2	36,5	24,1	40,5	34,6

II = along the face veneer grain direction

⊥ = across the face veneer grain direction

The material values in this DoP are to be used for structural calculations with EN 1995 (Eurocode 5).

ESSENTIAL CHARACTERISTICS		PERFORMANCE			
Bonding quality		Class 3 (exterior)			
Release of formaldehyde		E1			
Reaction to fire		**End use condition [1]**	**Minimum thickness (mm)**	**Class (excluding floorings)**	**Class (floorings)**
		- without an air gap behind the panel - mounted directly against class A1 or A2-s1, d0 products with minimum density 10 kg/m^3 or at least class D-s2,d2 products with minimum density 400 kg/m^3 - a substrate of cellulose insulation material of at least class E may be included if mounted directly against the panel, but not for floorings	9	D-s2, d0	D_{fl}-s1
		- with a closed or an open air gap not more than 22mm behind the panel - the reverse face of the cavity shall be at least class A2-s1,d0 products with minimum density 10 kg/m^3	9	D-s2, d2	-
		- with a closed air gap behind the panel - the reverse face of the cavity shall be at least class D2-s2,d2 products with minimum density 400 kg/m^3	15	D-s2, d1	D_{fl}-s1
		- with an open air gap behind the panel - the reverse face of the cavity shall be at least class D2-s2,d2 products with minimum density 400 kg/m^3	18	D-s2, d0	D_{fl}-s1
		- any	3	E	E_{fl}
Water vapour permeability		**Mean density**	**Wet cup**	**Dry cup**	
		460 kg/m^3	45 µ	500 µ	
Airborne sound insulation		NPD			
Sound absorption		0,10 (250 Hz – 500 Hz) 0,30 (1000 Hz – 2000 Hz)			
Thermal conductivity		0,12 W/(m K)			
Impact resistance		See annex 2			
Strength and stiffness under point load		See annex 1			
Mechanical durability	k_{mod}	According to EN 1995-1-1			
	k_{def}	According to EN 1995-1-1			

[1] A vapour barrier with a thickness up to 0,4 mm and a mass up to 200 g/m^2 can be mounted in between the panel and a substrate if there are no air gaps in between.

The material values in this DoP are to be used for structural calculations with EN 1995 (Eurocode 5).

ESSENTIAL CHARACTERISTICS	PERFORMANCE
Biological durability (EN 335)	Use class 2
Treatment against biological attack	Teknol Aqua
Content of pentachlorophenol (PCP)	< 5 ppm
Characteristic embedment strength	Calculated according to EN 1995-1-1: - characteristic density (ρ_k) 400 kg/m^3
Racking resistance	Calculated according to EN 1995-1-1: - panel thickness 9-30 mm - characteristic embedment strength, see above
Air permeability	NPD

The material values in this DoP are to be used for structural calculations with EN 1995 (Eurocode 5).

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

At Espoo on 2.12.2019

Henrik Söderström
SVP, Supply Chain Management
Metsä Wood

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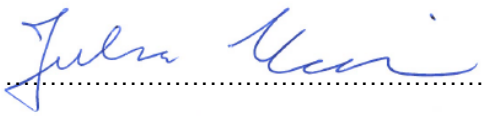
Juha Kasslin
VP, Product Management
Metsä Wood



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ESSENTIAL CHARACTERISTICS		PERFORMANCE						
Strength and stiffness under point load (50 x 50 mm²) for floor and roof panels (EN 12871):		Metsä Wood spruce plywood long edges of the panel tongue and grooved, and short edges supported						
		Nominal thickness (mm)						
		12	15	18	21	24	27	30
		Number of plies						
		4	5	6	7	8	9	10
Span 300 mm	Ultimate limit state capacity (N)	2230	3170	4370	4700	6150	7810	9070
	Serviceability limit state capacity (N)	1300	2580	2980	4700	4900	6730	6880
	Stiffness R_{mean} (N/mm)	456	646	994	1270	1580	2370	3170
Span 400 mm	Ultimate limit state capacity (N)	2230	3170	4370	4700	6150	7810	9070
	Serviceability limit state capacity (N)	1300	2580	2980	4700	4900	6730	6880
	Stiffness R_{mean} (N/mm)	296	420	646	830	1026	1540	2060
Span 600 mm	Ultimate limit state capacity (N)	2230	3170	4370	4700	6150	7810	9070
	Serviceability limit state capacity (N)	1300	2480	2980	4700	4900	6730	6880
	Stiffness R_{mean} (N/mm)	161	228	352	452	559	839	1120
Span 800 mm	Ultimate limit state capacity (N)	1530	3170	3760	4590	6150	6900	9070
	Serviceability limit state capacity (N)	1190	2370	2340	4160	4900	5890	6880
	Stiffness R_{mean} (N/mm)	105	148	228	293	363	545	729
Span 1200 mm	Ultimate limit state capacity (N)	1180	1700	3450	4540	4980	6820	9070
	Serviceability limit state capacity (N)	1130	1510	2010	3900	3160	3650	6880
	Stiffness R_{mean} (N/mm)	57	81	124	169	198	297	397

The material values in this DoP are to be used for structural calculations with EN 1995 (Eurocode 5).

ESSENTIAL CHARACTERISTICS		PERFORMANCE						
Strength and stiffness under point load (50 x 50 mm²) for floor and roof panels (EN 12871):		Metsä Wood spruce plywood all four edges of the panel supported						
		Nominal thickness (mm)						
		12	15	18	21	24	27	30
		Number of plies						
		4	5	6	7	8	9	10
Span 300 mm	Ultimate limit state capacity (N)	4590	5380	7030	8390	7720	12500	13200
	Serviceability limit state capacity (N)	3910	4550	4540	7620	4660	6970	8960
	Stiffness R_{mean} (N/mm)	968	1190	1320	1810	2720	3850	4790
Span 400 mm	Ultimate limit state capacity (N)	4460	5380	7030	8300	7720	12500	13200
	Serviceability limit state capacity (N)	3910	4550	4540	7620	4660	6970	8960
	Stiffness R_{mean} (N/mm)	629	772	858	1180	1760	2500	3110
Span 600 mm	Ultimate limit state capacity (N)	4190	5200	7030	8120	7720	12500	13200
	Serviceability limit state capacity (N)	3910	3820	4540	7620	4660	6970	8960
	Stiffness R_{mean} (N/mm)	342	420	467	642	962	1360	1690
Span 800 mm	Ultimate limit state capacity (N)	3660	4840	6350	7940	7720	12500	13200
	Serviceability limit state capacity (N)	2400	3090	4540	5240	4660	6970	8960
	Stiffness R_{mean} (N/mm)	222	273	303	417	625	885	1100
Span 1200 mm	Ultimate limit state capacity (N)	3390	4110	6010	7580	7720	12500	13200
	Serviceability limit state capacity (N)	1640	2260	4540	4050	4660	6970	8960
	Stiffness R_{mean} (N/mm)	121	149	165	313	340	482	599

The material values in this DoP are to be used for structural calculations with EN 1995 (Eurocode 5).

ESSENTIAL CHARACTERISTICS	PERFORMANCE						
Impact resistance for floor and roof panels (EN 12871):	**Metsä Wood spruce plywood** **Long edges of the panel tongue and grooved, and short edges supported** **or** **all four edges of the panel supported**						
	Nominal thickness (mm)						
	12	**15**	**18**	**21**	**24**	**27**	**30**
	Number of plies						
	4	**5**	**6**	**7**	**8**	**9**	**10**
Span ≤ 400 mm	Class II	Class I Class II	Class I Class II	Class I Class II	Class I Class II	Class I Class II	Class I Class II
Span ≤ 600 mm	Class II	Class II	Class I Class II	Class I Class II	Class I Class II	Class I Class II	Class I Class II
Span ≤ 800 mm	-	Class II	Class II	Class II	Class I Class II	Class I Class II	Class I Class II
Span ≤ 1200 mm	-	-	Class II	Class II	Class II	Class II	Class II

The material values in this DoP are to be used for structural calculations with EN 1995 (Eurocode 5).