

**JUUNOO**

# Code compliance review

JUUNOO DEMOUNTABLE WALL SYSTEM

MAXIME DE SCHEEMAEKER MAXIME@JUUNOO.COM | 6468214864

This document is written by Jelena Ivanisevic, building code consultant for JUUNOO. It will cover the next topics:

- Fire and Flame Spread Features
- Corridors
- Electrical Requirements

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The following code review focuses on the following codes as applicable to the demountable partition walls by JUUNOO:

## New York City

- Building Code 2022 (based on IBC 2015 edition)
- Mechanical Code 2022 (based on IMC 2015 edition)
- Electrical Code 2011

## California

- Building Code 2022 (based on IBC 2021 edition)
- Mechanical code 2022 (based on UMC 2021)
- Electrical Code 2022 (based on NFPA 70 2020)

As the IBC requirements are based on Occupancy Classification and Use of a space, it is assumed that the primary use of the walls and meeting boxes are for office use (Group B) and any other occupancy group/use of the products may result in different Code requirements.

All requirements and recommendations is my professional interpretation and judgement of the Codes and Standards defined within the document. The final approval of products and/or placement and/or the need for additional fire safety equipment is determined by the local Authority Having Jurisdiction (AHJ).

## Fire and Flame Spread Features

Includes the following chapters

- Chapter 6 - Combustible Materials
- Chapter 7 - Fire Partition/Fire Rated Construction
- Chapter 8 - Interior Finishes

### Chapter 6 - Combustible Materials

The building code (both NYC and CA) limits the use of combustible material in Type I and Type II (i.e. non-combustible, typically high-rise) construction. Combustible materials are permitted as:

1. Fire-retardant treated wood (Class A) in interior partitions
2. Thermal and acoustical insulation (Class A)

**603.1 Allowable Materials**

Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

 1. Fire-retardant-treated wood, complying with Section 2303.2, shall be permitted in:

- 1.1. Nonbearing interior partitions where the required fire-resistance rating is 1 hour or less.

**Exception:** Public corridors and exits shall be constructed of noncombustible materials.

- 1.2. Roof construction as permitted in Table 601, Note b.

 2. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of not more than 25.

**Exceptions:**

1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.
2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200.

## Chapter 7 - Fire Partition/Fire Rated Construction

Within an office (Group B) fit out, fire rated walls separating office/space is typically not required and are only required for special uses e.g. separated occupancies/uses, horizontal exits, or interior or public corridors.

The most likely use is considered to be an interior corridor, but the required fire rating for an interior corridor in a sprinklered building is 0.

## Chapter 8 - Interior finishes

### Interior wall and ceiling finishes

The exposed interior surfaces of buildings including, but not limited to: fixed or movable walls and partitions; toilet room privacy partitions; columns; ceilings; and interior wainscoting, panelling or other finish applied structurally or for decoration, acoustical correction, surface insulation, structural fire resistance or similar purposes, but not including trim.

#### *Wall and Ceiling Finishes (803)*

Interior wall and ceiling finishes must be tested to ASTM E84 or UL723 for flame spread and smoke development and are grouped in the following classes:

- Class A = Flame spread index 0-25; smoke developed index 0-450.
- Class B = Flame spread index 26-75; smoke developed index 0-450.
- Class C = Flame spread index 76-200; smoke developed index 0-450.

From table 803.11 (NYC Building Code) and 803.13 (California Building Code):

	Sprinklered	Non-sprinklered
	Rooms and Enclosed Spaces	
NYC	B	B
California	C	C

## Interior Finish vs Combustible Material Partition

The MDF of the partitions can either be considered an interior finish or an internal non-loadbearing partition under the code, in which the following applies:

### Interior Finish (803)

→ Flame spread classification Class B (NYC) or C (CA)

### Non-loadbearing non-fire rated partition (603.1)

→ Fire-retardant treated wood with a flame spread classification Class A

After speaking with a Technical Representative at the ICC (International Code Council), it is their opinion that the MDF would be considered part of the wall, i.e. would need to be fire retardant treated wood if installed in a non-combustible building.

If the MDF was attached to a non-combustible surface such as a layer of gypsum board, it would be considered an interior finish.

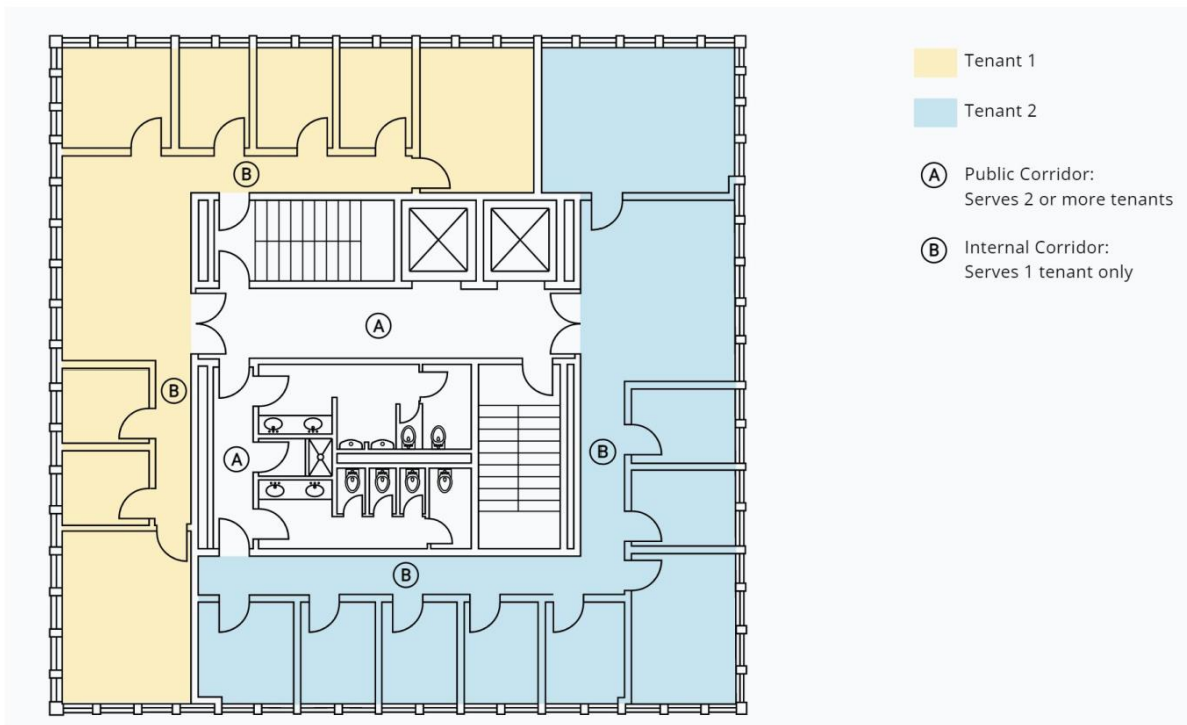
In the JUUNOO demountable wall set-up, the click panel (more details see 'Appendix A') is directly mounted on the metal stud. Therefore following the logic of a non-loadbearing non-fire rated partition.

JUUNOO can, upon request, produce products utilizing the fire treated MDF in 'Appendix B' which have a ASTM E84 classification of 1/A for panels less than 30mm thick (JUUNOO utilizes 10mm panels as the base click panel, both sides are finished with a melamine finish or a paintable finish) thus, satisfying this requirement.

## Corridors (1020)

In NYC Building Code, there's interior corridors and public corridors

- Interior corridor = serves one tenant = constructed as fire partitions
- Public corridor = serves multiple tenants = constructed as fire barriers



In CA Building Code there are only interior corridors, i.e. constructed as fire partitions.

Fire rating requirements (hours) for interior and public corridors are as follows:

	Sprinklered	Non-sprinklered	Sprinklered + Smoke proof stairs	No smoke proof stairs or sprinklers
	Interior Corridors		Public Corridors	
NYC	0	1	0	1
California	0	1	N/A	N/A

## Electrical Requirements

- NYC Electrical Code 2011 = NFPA 70 National Electrical Code 2008 Edition
- CA Electrical Code 2022 = NFPA 70 National Electrical Code 2020 Edition

### Article 605 - Office Furnishings

Office Furnishings: Cubicle panels, partitions, study carrels, workstations, desks, shelving systems and storage units that may be mechanically or electrically interconnected to form an office furnishing system.

<b>Applicability Alternative 1 - <i>Fixed-type Office Furnishing (605.7)</i></b>	<b>Applicability Alternative 2 - <i>Free-standing Type Office Furnishing, Cord- and Plug connected (605.9)</i></b>
<p>Office furnishings that are fixed (secured to building surfaces) shall be permanently connected to the building system by one of the methods in Chapter 3</p>	<p>Individual office furnishings of the freestanding type, or groups of individual office furnishings that electrically connected are mechanically contiguous and do not exceed 9m (30ft) when assembled shall be permitted to be connected to the building electrical system by a single flexible cord and plug, provided 605.9 A-D are met</p>
<p>Hardwired to building electrical system</p>	<p>(A) <b>Flexible Power-Supply Cord.</b> The flexible power supply cord shall be extra-hard usage type with 12 AWG or larger conductors, with an insulated equipment grounding conductor, and shall not exceed 600 mm (2 ft) in length.</p> <p>(B) <b>Receptacle Supplying Power.</b> The receptacle(s) supplying power shall be on a separate circuit serving only the office furnishing and no other loads and shall be located not more than 300 mm (12 in.) from the office furnishing that is connected to it.</p> <p>(C) <b>Receptacle, Maximum.</b> An individual office furnishing or groups of interconnected individual office furnishings shall not contain more than 13 15-ampere, 125-volt receptacles. For purposes of this requirement, a receptacle is considered (1) up to two (simplex) receptacles provided within a single enclosure and that are within 0.3 m (1 ft) of each other or (2) one duplex receptacle.</p> <p>(D) <b>Multiwire Circuits, Not Permitted.</b> An individual office furnishing or groups of interconnected office furnishings shall not contain multiwire circuits.</p>

## Appendix A

DECLARATION OF PERFORMANCE	
Reference :	DOPClicwall3
Commercial name :	Clicwall
Product type :	Melamine faced MDF Fibreboard
Reference standard :	Wood Based Panel - EN13986:2004+A1:2015 Annex A Table A.9
CE Class :	MDF
Field of application :	Walls (Internal use as non-structural component in dry conditions - Service Class 1)
AVCP Class :	4
Certification number:	Not Applicable
Produced at:	Breestraat 4, B-8710 Wielsbeke
	Ingelmunstersteenweg 299, B-8780 Oostrozebeke
	Ooigemstraat 3, B-8710 Wielsbeke

Essential Characteristic	Unit	Reference	Thickness range (mm)	
			10	12
Bending strength	N/mm <sup>2</sup>	EN 622-5	22	22
Modulus of elasticity in bending	N/mm <sup>2</sup>	EN 622-5	2500	2500
Internal bond	N/mm <sup>2</sup>	EN 622-5	0,60	0,60
Swelling in thickness, 24h	%	EN 622-5	NPD	NPD
Moisture resistance OPTION 1 : Internal bond	N/mm <sup>2</sup>	EN 622-5	NPD	NPD
Moisture resistance OPTION 1 : Swelling in thickness	%	EN 622-5	NPD	NPD
Surface Soundness	N/mm <sup>2</sup>	EN 622-5	NPD	NPD
Formaldehyde class	Class	EN 13986-table B1	E1	E1
Reaction to fire	Class	EN 13501-1	Ds2d0	Ds2d0
Water vapour permeability $\mu$	wet	EN 13986 - table 9	NPD	NPD
	dry		NPD	NPD
Airborne sound insulation	dB	EN 13986-5.10	NPD	NPD
Sound absorption $\alpha$		EN 13986 - table 10	0,10/0,20	0,10/0,20
Thermal conductivity $\lambda$	W/m.K	EN 13986 - table 11	0,13	0,13
Strength - tension $f_t$	N/mm <sup>2</sup>	EN 12369-1	NPD	NPD
Strength - compression $f_c$	N/mm <sup>2</sup>	EN 12369-1	NPD	NPD
Strength - bending $f_m$	N/mm <sup>2</sup>	EN 12369-1	NPD	NPD
Strength - panel shear $f_y$	N/mm <sup>2</sup>	EN 12369-1	NPD	NPD
Strength - planar shear $f_p$	N/mm <sup>2</sup>	EN 12369-1	NPD	NPD
Stiffness - tension $E_t$	N/mm <sup>2</sup>	EN 12369-1	NPD	NPD
Stiffness - compression $E_c$	N/mm <sup>2</sup>	EN 12369-1	NPD	NPD
Stiffness - bending $E_m$	N/mm <sup>2</sup>	EN 12369-1	NPD	NPD
Stiffness - panel shear $G_y$	N/mm <sup>2</sup>	EN 12369-1	NPD	NPD
Impact resistance	Class	EN 12871	NPD	NPD
Punishing shear strength $R_{mean}$	N/mm <sup>2</sup>	EN 1195	NPD	NPD
Punishing shear strength $F_{ser,k}$	N/mm <sup>2</sup>	EN 1195	NPD	NPD
Punishing shear strength $F_{max,k}$	N/mm <sup>2</sup>	EN 1195	NPD	NPD
Linear expansion $\delta_{10,85}$	mm/m	EN 318	NPD	NPD
Mechanical durability (kmod; kdef)		Shall be taken from :	NPD	NPD
Biological durability	Service Class	EN 335	1	1
Content of PCP	ppm	EN 13986-5.18	<5	<5

(\*) <9mm : E; 9mm : Ds2,d0

Informative Characteristic	Unit	Reference	Thickness range (mm)	
			10	12
Formaldehyde content	mg/100g	EN 120	< 8 mg/100g DS	



## Appendix B

DECLARATION OF PERFORMANCE	
Reference :	DOPFibraluxFRv2
Commercial name :	Fibralux FR
Product type :	MDF Fibreboard
Reference standard :	Wood Based Panel - EN13986:2004+A1:2015 Annex A Table A.9
CE Class :	MDF.LA FR
Field of application :	Internal use as structural component in dry conditions
AVCP Class :	1
Certification number:	1161-CPR-1221 [6-12mm] ; 1161-CPR-0190 [12-30mm]
Produced at:	Rue de la Forêt 2, B-6690 Vielsalm

Essential Characteristic	Unit	Reference	Thickness range (mm)					
			6	>6 - 9	> 9 - 12	>=12-19	>19-30	>30-45
Bending strength	N/mm <sup>2</sup>	EN 622-5	29	29	27	25	23	NPD
Modulus of elasticity in bending	N/mm <sup>2</sup>	EN 622-5	3000	3000	2800	2500	2300	NPD
Internal bond	N/mm <sup>2</sup>	EN 622-5	0.70	0.70	0.65	0.60	0.60	NPD
Swelling in thickness, 24h	%	EN 622-5	30	17	15	12	10	NPD
Moisture resistance OPTION 1 : Internal bond	N/mm <sup>2</sup>	EN 622-5	NPD	NPD	NPD	NPD	NPD	NPD
Moisture resistance OPTION 1 : Swelling in thickness	%	EN 622-5	NPD	NPD	NPD	NPD	NPD	NPD
Surface Soundness	N/mm <sup>2</sup>	EN 622-5	NPD	NPD	NPD	NPD	NPD	NPD
Formaldehyde class	Class	EN 13986-table B1	E1	E1	E1	E1	E1	NPD
Reaction to fire	Class	EN 13501-1	B-s2d0	B-s2d0	B-s2d0	B-s1d0	B-s1d0	NPD
Water vapour permeability $\mu$	wet	EN 13986 - table 9	20	20	20	20	20	NPD
	dry		12	12	12	12	12	NPD
Airborne sound insulation	dB	EN 13986-5.10	NPD	NPD	NPD	NPD	NPD	NPD
Sound absorption $\alpha$		EN 13986 - table 10	0,10/0,20	0,10/0,20	0,10/0,20	0,10/0,20	0,10/0,20	NPD
Thermal conductivity $\lambda$	W/m.K	EN 13986 - table 11	0.1	0.1	0.1	0.1	0.1	NPD
Strength - tension $f_t$	N/mm <sup>2</sup>	EN 12369-1	13	13	13	12.5	12	NPD
Strength - compression $f_c$	N/mm <sup>2</sup>	EN 12369-1	13	13	13	12.5	12	NPD
Strength - bending $f_m$	N/mm <sup>2</sup>	EN 12369-1	21	21	21	21	21	NPD
Strength - panel shear $f_v$	N/mm <sup>2</sup>	EN 12369-1	6.5	6.5	6.5	6.5	6.5	NPD
Strength - planar shear $f_r$	N/mm <sup>2</sup>	EN 12369-1	NPD	NPD	NPD	NPD	NPD	NPD
Stiffness - tension $E_t$	N/mm <sup>2</sup>	EN 12369-1	2900	2900	2900	2700	2000	NPD
Stiffness - compression $E_c$	N/mm <sup>2</sup>	EN 12369-1	2900	2900	2900	2700	2000	NPD
Stiffness - bending $E_m$	N/mm <sup>2</sup>	EN 12369-1	3700	3700	3700	3000	2900	NPD
Stiffness - panel shear $G_v$	N/mm <sup>2</sup>	EN 12369-1	800	800	800	800	800	NPD
Impact resistance	Class	EN 12871	NPD	NPD	NPD	NPD	NPD	NPD
Punishing shear strength $R_{mean}$	N/mm <sup>2</sup>	EN 1195	NPD	NPD	NPD	NPD	NPD	NPD
Punishing shear strength $F_{ser,k}$	N/mm <sup>2</sup>	EN 1195	NPD	NPD	NPD	NPD	NPD	NPD
Punishing shear strength $F_{max,k}$	N/mm <sup>2</sup>	EN 1195	NPD	NPD	NPD	NPD	NPD	NPD
Linear expansion $\delta_{l,30,85}$	mm/m	EN 318	NPD	NPD	NPD	NPD	NPD	NPD
Mechanical durability (kmod; kdef)		Shall be taken from :	NPD	NPD	NPD	NPD	NPD	NPD
Biological durability	Service Class	EN 335	1	1	1	1	1	NPD
Content of PCP	ppm	EN 13986-5.18	<5	<5	<5	<5	<5	NPD

Informative Characteristic	Unit	Reference	Thickness range (mm)					
			6	>6 - 9	> 9 - 12	>=12-19	>19-30	>30-45
Formaldehyde class	Class	ASTM E1333	CARB 2 < 0.11 ppm [6 -> 30mm]					
Formaldehyde class	Class	ASTM E1333	TSCA Title VI (EPA) < 0.11 ppm [6 -> 30mm]					
Reaction to fire	Class	ASTM E84	Class 1/A [6 -> 30mm]					
Reaction to fire	Class	CAN/ULC-S102	Flame Spread Rating & Smoke Developed Classification Compliant					