



GUARDIAN® MDO SIGN/INDUSTRIAL

Product Description:

Guardian® MDO is a economical, paint grade, medium density overlaid plywood provides a good surface for finishing.

Panel Construction & Moisture Resistance:

Guardian® MDO is constructed of a Medium Density overlay applied to plywood with Douglas Fir/Hemlock construction. It is manufactured with a 1 step layup, has a waterproof glue bond and meets APA PS 1-07 specifications. All Olympic products are made in the USA.



Features and Benefits:

- Economical, standard MDO panel
- Easily painted
- Durable surface
- High strength, light weight
- Waterproof bond for water/high humidity resistance
- High Face/Edge screwholding
- Very low Formaldehyde - meets proposed CARB requirements

Working Faces/Treatment:

Guardian® MDO 4' width is available with 1 or 2 working faces and no backer. Guardian® MDO 5' width is available with 1 working face and no backer only. The working face consists of natural (brown), resin impregnated MDO cellulose overlay

Working Edges/Treatment:

- Edges are factory sawn, without edge treatment.
- Fill, prime & top coat all exposed wood with at least two coats of acrylic, polyurethane or polyurethane-acrylic primers & paints or exterior grade caulking.

Applications:

- Exterior signage & bill boards
- Cabinet, display, fixture, shelving and workbench tops
- Pallets, bins, totes, crates & reels
- Agricultural & industrial wall lining; soffit & fascia, noise barrier
- Truck body & trailer liners & doors and boat seats
- Theatre/ movie set scenery

Limitations:

Guardian® MDO is not a finished product. It requires 2 top & 2 edge coats for exterior applications. For structural applications, consult Olympic Panel for load tables.

Thicknesses & Sizes:

Guardian® MDO is available in 5/16", 3/8", 1/2", 5/8", 3/4", 1-1/8", 1-1/4" & 1-1/2" thicknesses. Standard panel sizes are 4' wide X 8' & 10' long and 5' wide X 8' long only. Non standard thicknesses meeting volume requirements are available.

Product Grade

Standard products are shipped 100% on grade, unless specified otherwise. Special products are shipped allowing up to 10% total Good One Side (G1S) and/or Shop, identified & priced separately. Shipments of G1S and shop only may be available. Check with sales.

- **Economical, standard MDO panel**
- **Durable, easily painted surface**
- **High strength, light weight**

Technical Data Applicable Standards

All panels are manufactured by Olympic Panel Products per Product Standard PS1-07. This standard is available at www.apawood.org.

Physical Properties ¹	3/8" to 1/2"	5/8" to 1-1/8"
Modulus of Rupture ^{2,3}	6,670 psi	6,860 psi
Modulus of Elasticity ^{2,3}	795,050 psi	853,565 psi
Lineal Expansion ^{2,3}	0.056%	0.050%
Thickness Swell	3.8%	3.8%
Water Absorption (24 Hours)	6.0%	6.0%
Internal Bond ²	180 psi	134 psi
Shelf Stiffness EI ASTM D-3043 C	74,770 lb-in ² /ft ⁶	606,720 lb-in ² /ft ⁶
Shelf Bending FbS ASTM D-3043 C	1,615 lb-in/ft ⁶	6,460 lb-in/ft ⁶
Face Screw holding ²	430 lbs	449 lbs
Edge Screw holding ²	Not Applicable	408 lbs
Moisture Content ² ASTM D-1037	6-9%	6-9%
Specific Gravity ² ASTM D-1037	.592	.527
Density ² ASTM D-1037	36.9 lbs/ft ³	32.9 lbs/ft ³
Flame Spread ASTM E-84	76 - 200 ⁵	76 - 200 ⁵
Smoke Developed ASTM E-84	25 - 270 ⁵	25 - 270 ⁵
Flame/Smoke spread rating E-84	Class C	
Formaldehyde level E-1333	< 0.01 parts/million	

Panel Tolerances ²	3/8" to 3/4"	1" & greater
Thickness Tolerance	+/- 1/32" (.031")	+/- 5%
Length & Width Tolerance	+0, -1/16" (.062")	+0, -1/16" (.062")
Squareness	1/16" (.062")	1/16" (.062")
Straightness	1/16" (.062")	1/16" (.062")

¹ Panel Average. Product averages vary for individual thicknesses, consult sales or technical staff for exact properties ²All tolerances and specifications apply at the time of manufacture. ³ANSI 208.1 test result ⁴Calculations based on test averages of along and across grain ⁵Shelving physical properties based on limited 5 panel average. See web site for load table ⁶Flame and Smoke spread properties based on engineering calculations ⁷Shelving stiffness/bending properties are based on a limited 5 panel average

Weatherability

EMMAQUA* Outdoor Accelerated Weathering Test Simulates 3.4 years in Florida and 2.9 years in Arizona					
Test	CHALK UNWSH	COLOR CHNGE UNWSH	CRACK UNWSH	BLIST UNWSH	CHECK UNWSH
ASTM #	D 4214-97	D1729-96 (2003)	D661-93 (2000)	D 714-02	D660-93 (2000)
Chromatic	Barely Traceable	Moderate Bleaching	None	None	None
Oil Alkyd	Moderate	Moderate Bleaching	Moderately Severe Long Line	None	None
Acrylic Latex	Trace	None	Barely Traceable Irregular	None	None

*Equatorial Mount with Mirrors for Acceleration with Water
CHALK UNWSH = Chalking, Unwashed Area: ASTM D 4214-97 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films (Method A/Cloth Method)
COLOR CHNGE UNWSH = Visual Color, Unwashed Area: ASTM D1729-96 (2003) - Practice for Visual Appraisal of Color and Color Difference of Diffusely-Illuminated Opaque Materials
CRACK UNWSH = Cracking, Unwashed Area: ASTM D661-93 (2000) - Method for Evaluating Degree of Cracking of Exterior Paints
BLIST UNWSH = Blistering, Unwashed Area: ASTM D 714-02 - Method for Evaluating Degree of Blistering of Paints
CHECK UNWSH = Check, Unwashed Area: ASTM D660-93 (2000) - Method for Evaluating Degree of Checking of Exterior Paints

Standard Packaging:

Thickness	Guardian® MDO 1 Face, No Back Average* Weight lbs./SF	Guardian® MDO 2 Face Average* Weight lbs./SF	Pieces per Unit
5/16"	.950	.970	105
3/8"	1.080	1.100	88
1/2"	1.500	1.600	66
5/8"	1.750	1.850	50
3/4"	2.100	2.347	44
1-1/8"	3.350	3.400	30
1-1/4"	3.620	3.700	26
1-1/2"	4.350	4.400	22

Average product weights may vary +/- 10%

Guardian® MDO Shelving Load Span Table

Span ¹	1/2"		5/8"		3/4"	
	ℓ/240	ℓ/180	ℓ/240	ℓ/180	ℓ/240	ℓ/180
4"	1,899	1,899	2,340	2,340	2,870	2,870
8"	730	730	900	900	1,104	1,104
12"	452	452	557	557	683	683
16"	301	323	404	404	495	495
19.2"	176	225	331	331	405	405
24"	90	121	175	230	227	303
30"	46	61	91	121	120	160
32"	38	50	75	100	99	133
36"	26	35	53	70	70	94
40"		26	38	51	52	69
48"			25	34	34	46
60"					24	32

Span ¹	1/2"		5/8"		3/4"	
	ℓ/240	ℓ/180	ℓ/240	ℓ/180	ℓ/240	ℓ/180
4"	1,457	1,457	1,811	1,811	2,208	2,208
8"	560	560	696	696	849	849
12"	347	347	431	431	526	526
16"	229	251	280	280	381	381
19.2"	130	173	195	195	312	312
24"	65	86	125	125	230	230
30"	32	43	76	80	145	147
32"	27	35	63	70	119	129
36"		25	44	55	83	102
40"			32	42	61	81
48"			21	28	40	53

Span ²	1/2"		5/8"		3/4"	
	ℓ/240	ℓ/180	ℓ/240	ℓ/180	ℓ/240	ℓ/180
4"	2,374	2,374	2,926	2,926	3,588	3,588
8"	913	913	1,125	1,125	1,380	1,380
12"	349	465	652	697	814	854
16"	142	189	275	367	357	476
19.2"	80	107	158	211	208	278
24"	40	53	80	106	106	142
30"	20	26	40	53	54	72
32"		22	33	44	44	59
36"			23	30	31	41
40"				22	22	30
48"						20

Span ²	1/2"		5/8"		3/4"	
	ℓ/240	ℓ/180	ℓ/240	ℓ/180	ℓ/240	ℓ/180
4"	1,822	1,822	2,263	2,263	2,760	2,760
8"	701	701	870	870	1,062	1,062
12"	259	345	498	498	657	657
16"	102	136	237	280	446	476
19.2"	57	75	133	177	253	337
24"	28	37	66	88	126	168
30"			33	44	63	84
32"			27	36	51	69
36"				25	36	48
40"					26	34

Maximum allowable loads are psf. Uniform loading is assumed. Loads are for dry conditions. For wet conditions, reduce loads approximately 25%. Inquire for precise data. Basic allowable stresses (bending F b and shear F s) increase 15% for shelving use per the APA experience factor. Pallet design normally is based on higher allowable loads than given. NOTES: ¹Spans are center-to-center of supports. ²Span is out-to-out of supports. Allow for 1-1/2" supports on each end.

Guardian® MDO Finishing Instructions

General: Do not use interior grade paints, water base vinyl-acrylic, solvent based alkyd flat or alkyd solid color stains.

- Coating system:** Use a high quality exterior industrial enamel:
 - Water Based: All-Acrylic semi-gloss or gloss enamel system or
 - Solvent Based: Industrial semi-gloss or gloss enamel system.
 - Sign Chromatic based: Semi-gloss or gloss system.

Application: Follow overcoat producer instructions. Use good painting practices. Perform a tape pull test (ASTM D3359) before lettering.

- Prime Coat:** For good performance, 2 coats of primer should yield about 1 mil dry film thickness. Latex primers are recommended. Follow the spreading rate recommended by the manufacturer.
- Top Coat:** Once properly primed, panels must be top-coated with 2 coats of a variety of finishes, including solvent-thinned and water-thinned paints and enamels. Both primer and topcoat should be obtained from the same manufacturer to ensure compatibility. Follow the manufacturer's application instructions. Do not apply automotive primers and enamels, lacquer undercoats and topcoats directly to overlaid plywood.
- Edge Coating:** Fill, prime & top coat all exposed wood with at least two coats of acrylic, polyurethane or polyurethane-acrylic primers & paints or exterior grade caulking.

Suitability for Use and Warranty

Nothing herein constitutes a warranty express or implied, including any warranty of merchantability or fitness for use, nor is protection from any law or patent to be inferred. The exclusive remedy for all claims is replacement of materials. Contact the sales office for a copy of the complete Olympic Terms and Conditions of Sale.

Warehouse Storage and Handling

- Store in a dry, clean, well-ventilated area indoors.
- Avoid temperatures and moisture extremes. Allow panels to equalize for 72 hours or more before use.
- Pieces must not be stored in contact with the ground.
- Limit the stacking height to four or five units. Separate units with clean, dry spacers of uniform thickness, aligned carefully. Use three spacers for panels 8' long, four or five spacers for longer panels.

Environmental Impact

Olympic Panel produces overlaid softwood plywood from veneer peeled at the Olympic plant and from purchased veneer. All veneer and plywood panels are manufactured in accordance with the following principals:

- Logs and veneer originate in sustainable, secondary growth forests, which are managed according to Federal and State laws and regulations.
- Olympic Panel uses energy efficient, environmental control technology to reduce emissions to levels below federal and state guidelines.
- Olympic Panel uses process by-products to produce energy.
- Olympic's products are renewable, biodegradable and recyclable.

Warnings

This product contains < 0.01 parts/million of residual formaldehyde from manufacturing. This product will generate wood dust from sawing, sanding, or shaping. Material Safety Data Sheets are available on Olympic's Web site at www.olypanel.com and upon request. Structural panels (PS-1) are exempt from California Air Resources Board regulations, however, this product is below CARB limits for all uses.

Sign Board

- **Highway® HDO** - Premium sign panel, prepped for reflective film.
- **SignReady UV™** - Prefinished, high gloss, paint/vinyl letter ready, 5 yr limited warranty.
- **Pre-finished UV™** - Prefinished, satin gloss, paint/vinyl letter ready, 2 yr limited warranty.
- **Signal® MDO** - Two Step®, hardwood faced, tightly laid core, ideal for cutout letters.
- **Pre-Primed MDO** - Exclusive, primed overlay, Two Step®.
- **Crezon®/Two Step® MDO** - Premium paint grade.
- **Guardian® MDO** - Standard paint grade.

Olympic Panel Technical/Sales Information

204 East Railroad Avenue; Shelton, WA 98584
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www.olypanel.com

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