



HIGHWAY® HDO SIGN BOARD

Product Description:

Highway HDO® is a premium, high durability, long lasting HDO plywood, prepped for reflective film or paint for Federal & State highway, state, county, municipal and commercial signage.

Panel Construction & Moisture Resistance:

Highway® HDO is constructed of premium, High Density Overlay, hardwood faced plywood with Douglas Fir inner plys. It is produced with a 2 Step layup with limited core voids. Standard and Texas cores are available. Highway® HDO has a waterproof glue bond and meets APA PS 1-07 specifications. All Olympic products are made in the USA.



Features and Benefits:

- Buff Highway® HDO is Reflective film or paint ready.
- Non-standard Texas DMS 7100 & Illinois T-7-2006 are available.
- Extremely durable with long life.
- Exceptional weatherability.
- 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:

Highway® HDO is available with 2 working faces only. Working faces are available in natural (buff) and black colors. Natural HDO is ready for paint or film. For best results, see finishing instructions. Black HDO requires chemical prep before finishing. Contact OPP for instructions.

Working Edges/Treatment:

- Edges are factory sawn, without edge treatment.
- Seal all edges using clear/pigmented Pre-Form by Nox-Crete or equivalent. Per-Form can not be over coated.

Applications:

- Exterior signage with reflective films or paint.
- Pallets, bins, totes, crates & reels & tank stock.
- Pattern & die stock; Marine components; Military tables & cases.
- Slides, chutes, decks & conveyor plates.
- Industrial doors, ducts, hoods & barricades.

Limitations:

Do not exceed shelving span table design limitations. Black Highway must be chemically prepped before paint/film is applied. Buff Highway must be prepped before it is laminated with reflective film & edge sealed or primed, top coated & edge sealed for exterior exposure.

Thicknesses & Sizes:

Highway® HDO is available in 3/8", 1/2", 5/8", 3/4" & 1" thicknesses. Standard panel sizes are 4' X 8' & 10' only. 10' Highway is available with a fir face only. Non standard thicknesses meeting volume requirements are available.

- Buff HDO is reflective film or paint ready
- Texas DMS 7100 & Illinois T-7-2006 available
- Extremely durable with long life
- Exceptional weatherability
- High strength, light weight
- Waterproof bond = water/humidity resistance
- High Face/Edge screwholding

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"
Modulus of Rupture ^{2,3}	6,900 psi	6,800 psi
Modulus of Elasticity ^{2,3}	846,890 psi	892,720 psi
Lineal Expansion ^{2,3}	.045%	.056%
Thickness Swell	3.4%	3.4%
Water Absorption (24 Hours)	6.0%	6.0%
Internal Bond ²	173 psi	185 psi
Shelf Stiffness EI ASTM D-3043 C	68,280 lb-in ² /ft ⁶	602,180 lb-in ² /ft ⁶
Shelf Bending FbS ASTM D-3043 C	1,625 lb-in/ft ⁶	6,420 lb-in/ft ⁶
Face Screw holding ²	414 lbs	432 lbs
Edge Screw holding ²	Not Applicable	418 lbs
Moisture Content ² ASTM D-1037	6-9%	6-9%
Specific Gravity ² ASTM D-1037	.572	.592
Density ² ASTM D-1037	35.6 lbs/ft ³	36.9 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")

¹5 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)
Reflective Film Applied	None	None	None	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

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.

Standard Packaging:

Thickness	Highway® HDO Average* Weight lbs/SF	Highway® HDO Average* Weight lbs/panel	Pieces per Unit
3/8"	1.310	41.9	88
1/2"	1.640	52.5	66
5/8"	2.010	64.3	50
3/4"	2.390	76.5	44
1"	3.250	104.0	33

Average product weights may vary +/- 10%

Highway® HDO 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"	414	414	557	557	683	683
16"	233	233	367	367	495	495
19.2"	155	162	255	255	405	405
24"	80	104	163	163	307	307
30"	41	54	85	104	170	196
32"	33	44	70	92	141	173
36"	23	31	49	66	100	133
40"		22	36	48	73	98
48"			24	32	49	65
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"	307	307	431	431	526	526
16"	173	173	289	289	381	381
19.2"	111	120	201	201	312	312
24"	55	74	128	128	230	230
30"	28	37	82	82	129	147
32"	23	30	71	72	106	129
36"		21	50	57	74	99
40"			36	46	54	72
48"			24	32	35	47

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"	307	410	609	652	854	854
16"	125	167	257	343	507	619
19.2"	71	94	147	197	296	394
24"	35	47	74	99	151	202
30"		23	37	50	77	102
32"			31	41	63	84
36"			21	28	44	59
40"				20	32	42
48"					21	28

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"	690	690	870	870	1,062	1,062
12"	221	295	514	514	657	657
16"	87	116	270	289	395	476
19.2"	48	64	152	201	224	299
24"	24	32	75	100	112	149
30"			37	50	56	74
32"			30	41	46	61
36"			21	28	32	42
40"				20	23	30

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. ² Span is out-to-out of supports. Allow for 1-1/2" supports on each end.

Highway® HDO Finishing Instructions

Buff HDO: For best results, clean surface, remove contaminants and lightly abrade with 150/200 grit sandpaper. Remove sanding dust with a tack rag. Use 3M Scotchlite 680-10 or equivalent. Do not use Gerber Quantum 2000 white reflective film. Test tapes & paints for adhesion.

Black HDO: requires chemical prep. Contact OPP for instructions.

General: When fast-drying primers are desired, oil/alkyd types are recommended. Interior grade paints, water base vinyl-acrylic, solvent based alkyd flat or alkyd solid color stains are not recommended.

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Specifications subject to change without notice.

Effective: 11/2007; Replaces: 8/2007

- 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 recommendations. 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:** Seal all edges using clear/pigmented Pre-Form by Nox-Crete or equivalent. Per-Form can not be over coated.

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 plywood from veneer peeled at the Olympic plant and from purchased veneer. All veneer and plywood panels are produced in accordance with the following principals:

- Logs 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 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 requirements 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

Sales phone: 800-782-7265 Sales Fax: 360-432-5081

www.olypanel.com

