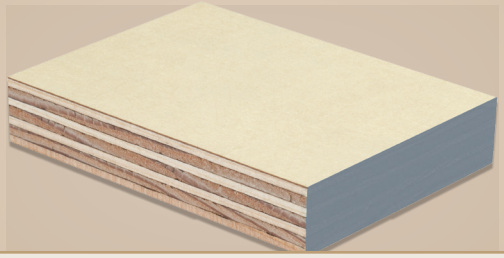
Regular HDO® Two-Step® Concrete Form



- Increased # of pours & reduced cost/pour
- Excellent 100/30 performance
- Increased durability
- Enhanced panel stability using SwanPeel®, SwanDry® and SwanPatch™ technologies



Swanson Group® provides the highest proven performance in conform panel solutions. Customers recognize our exceptional history of performance, exhibited in our panel solutions, including the first HDO/MDO "combi" panels in North America.

Swanson works directly with customers to establish relationships based upon market needs, panel design properties, overlay technologies, and application experience. We are now enhancing our capability to provide superior panel performance. **Swanson is manufacturing in a new state-of-the-art facility which is the most sophisticated overlay panel facility in North America.**

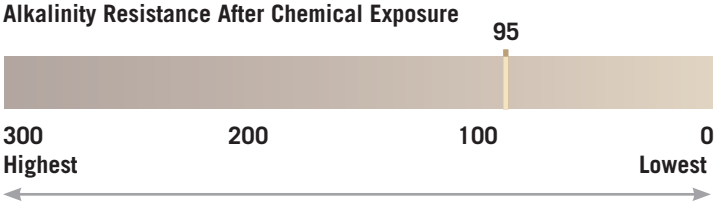
Product Description:
Regular HDO® Two-Step® is a standard, high-density overlaid plywood panel for semi-gloss finishes on smooth or coated concrete. It is a high-value panel that balances cost, multiple reuses and concrete appearance.

Panel Construction/Moisture Resistance:
Regular HDO® Two-Step® is a high-density, 100# overlay on plywood with Douglas Fir veneers using SwanPeel®, SwanDry® and SwanPatch™ technologies. It has a waterproof glue bond and layup meets APA PS-1, phenolic glue system design with high bonding specifications for extreme exterior applications. All Swanson products are made in the USA.

Working Faces/Treatment:
- Regular HDO® Two-Step® is available with one working face with an HDO backer sheet (100/30) or with two working faces (100/100)
- Gloss level of concrete surface: semi-gloss
- Wood grain transfer to concrete surface: minor
- Wood defect transfer to concrete: slight
- Sugaring: none
- Maintenance: limited

Working Edges/Treatment:
- Factory sawn and sealed with special gray, styrene acrylic sealer.
- Seal all exposed wood (edges and holes) with Edge-Flex 645 by Nox-Crete, Swanson Form Seal by Willamette Valley Co. or equivalent to prevent concrete staining from the wood sugars

Alkalinity Resistance After Chemical Exposure



The Abrasion and Chemical Resistance Test reflects the expected panel life in the field. The higher the index number, the more resistant to alkalinity/abrasion.

Structural/Load Performance Summary
Regular HDO® Two-Step is avaiable in Structural 1. Allowable pressure ℓ/270 ¾" @ 12" OC (face gain across supports): Struct 1 - 1190 PSF (wet).

Typical Pour Ranges:
- Engineered systems: Not Recommended
- Gang forms: up to 30 pours
- Job built: up to 15 pours
- Pour ranges are not guaranteed because the number of pours will vary due to jobsite handling and panel maintenance, vertical or horizontal use, form release agent, concrete mix design/strength, alkalinity, pour rate and other factors

Release Coating:
- Release agent: not factory treated
- Coating required: light before first and each subsequent pour
- Recommended release agent: Nox-Crete Release Agent #10 (oil based), Bio-Nox (water based and readily biodegradable) or equivalent.
- Special applications or use requirements may dictate the need for alternative release agents. Contact Swanson Group Sales, Nox-Crete or alternative manufacturer for more information.

Other Applications:
- Pallets, bins, totes, crates, reels
- Tanks, vats, freezer liners, storage lockers, trunks and shelving
- Animal enclosures, farm buildings & equipment

Limitations:
Do not exceed design limitations imposed by the load span table. Conform to concrete form design procedures based on American Con-crete Institute (ACI) standard 347-04. Release agents are required. Do not employ used concrete form for structural applications. Do not coat or laminate this panel without surface preparation. For coating or laminating information, ask Swanson for technical assistance.

Thicknesses & Sizes:
Regular HDO® Two-Step® is available in 1/2", 11/16", 3/4", and 1-1/8". Standard panel sizes are 4'x8'. Non-standard thicknesses, widths and lengths meeting volume requirements are available.

Technical Data Applicable Standards
All panels are manufactured by Swanson Group® per product standard PS-1. This standard is available at www.apawood.org.

Physical Properties	1/2"	11/16" to 1-1/18"
Check Resistance – APA Test #6	2.65mm	2.65mm
Moisture Resistance (Cobb) 8-hour Soak	3.09 g/sq. ft.	3.09 g/sq. ft.
Alkalinity Resistance After Chemical Exposure D/T	90	90
Formaldehyde Level ASTM E-1333	< 0.01 parts/million	< 0.01 parts/million

Panel Tolerances	1.2" to 3/4"	1-1/8"
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")

Note: All tolerances and specifications apply at the time of manufacture.
Note: Product averages vary for individual thicknesses. Consult sales or technical offices for exact properties.

Standard Packaging:

Thickness	Regular HDO® 1 Side/HDO Back Average Weight* lbs./Panel	Pieces per Unit
1/2"	53.3	66
11/16"	73.7	45
3/4"	76.0	44
1-1/8"	110.4	30

*Average product weights may vary +/- 10%

Product Grade

Standard product is shipped on grade only. Special product is shipped allowing up to 10% total shop, identified & priced separately. Shipments of shop may be available.

Stress and Load Span Tables

These stress and load span tables simulate actual wet form conditions Dry load span values are overstated and should not be used. Canadian (COFI) design values for Douglas Fir are 25% higher than APA.

Wet Stress Tables: Tables 1 & 2 are based on standard APA and PS-1 criteria.

Stress Table – Wet, Working Stress Design Capacities	Two–Step® Struct 1		
Nominal Thickness	1/2"	5/8"	3/4"
Number of Plys	5	7	7
Table 1: Face Grain Perpendicular to Supports-Dry[1]			
Bending Stiffness[1]	119,267	246,359	397,676
Bending Resistance[2]	521.3	838.4	1,118.5
Planar Shear[3]	308.0	324.4	383.8
Table 2: Face Grain Parallel to Supports-Dry[1]			
Bending Stiffness[1]	67,090	148,598	301,870
Bending Resistance[2]	468.5	746.4	1,201.4
Planar Shear[3]	180.9	290.9	369.4

[1]Bending Stiffness = EI* (lb-in^2/ft); [2]Bending Resistance = M or FbS (lb-in/ft); [3]Planar Shear Capacity: V or F_sIb/Q (lb/ft). There is no DOL (Duration of Load) or experience factor applied to EI. FbS and FsIb/Q.

Load Span Tables: Tables 3 and 4 are based on standard APA and PS-1 criteria.

Struct 1 LOAD SPAN TABLES – WET CONDITIONS Recommended Maximum PSF on Struct 1 Two-Step® Panels						
Table 3: Face Grain *Perpendicular* to Supports[1]						
Support Spacing	Plywood Thickness – Allowable Pressure (PSF)					
	1/2"		5/8"		3/4"	
(in.)	ℓ/360	ℓ/270	ℓ/360	ℓ/270	ℓ/360	ℓ/270
8"	1,345	1,540	1,620	1,620	1,920	1,920
12"	430	570	760	1,005	1,055	1,190
16"	180	245	345	455	500	665
19.2"	105	140	200	270	305	405
24"			105	140	160	215
Table 4: Face Grain *Parallel* to Supports[1]						
Support Spacing	Plywood Thickness – Allowable Pressure (PSF)					
	1/2"		5/8"		3/4"	
(in.)	ℓ/360	ℓ/270	ℓ/360	ℓ/270	ℓ/360	ℓ/270
8"	905	905	1,455	1,455	1,845	1,845
12"	275	365	560	745	1,030	1,145
16"	110	150	235	310	445	595
19.2"		105	165	220	320	425
24"					165	220

Notes: [1]Plywood continuous across two or more spans
These are total loads (weight of panel should be considered in horizontal applications). DOL (Duration of Load) 1.25 and Experience factor of 1.30 used in load tables.
Load duration factor of 1.25 applies to FbS and Fs(lb/Q).Experience factor of 1.30 applies to FbS and Fs(lb/Q)

Form Panel Thickness: For more detailed design information, refer to APA publication "Design/Construction Guide: Concrete Forming V345" and to American Concrete Institute publication "Formwork for Concrete."

Edge Support: In high moisture/sustained load conditions, edges may have a greater deflection than the panel center and may exceed calculated deflection.

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 Swanson Terms and Conditions of Sale.

Warehouse Storage and Handling

- Store in a dry, clean, well-ventilated area indoors
- Avoid temperature 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

Jobsite Care and Handling

1. **Product preparation:** Swanson's Regular HDO® panels are not factory release coated. Lightly coat panels prior to first use and each subsequent use with Nox-Crete Release Agent #10, Bio-Nox or equivalent that will not bond with, stain or adversely affect concrete surfaces. Follow the manufacturer's recommendations for application.
2. **Pouring and Vibrating:** While panels are highly resistant to abrasion and impact, they can be damaged through improper use. Follow the rate of pour to reduce excessive pressure that can cause panel damage. Use rubber tipped vibrators and exercise care not to damage form faces.
3. **Stripping:** Prolong panel life with proper stripping and handling. Use wood wedges, rather than metal bars or pries, to separate the form from the concrete. Form panels must be lowered, not thrown or dropped, to avoid face and edge damage.
4. **Cleaning:** Storage and edge sealing—Clean panels after each use, employing burlap or flat, non-scratching tools such as plastic or wood scrapers. Reseal cut edges or exposed wood at holes or openings with two coats of a styrene acrylic sealer. Stack panels flat and remove fasteners to prevent damage and warping. Store panels in a protected area and avoid direct sunlight.
5. **Surface Repairs:** Remove form release agent, concrete & loose wood/overlay debris. Sand the damaged surface with coarse (80 grit) disc or paper. For architectural concrete, use fine (120 grit) for the damaged perimeter area. Clean all sanding debris from the repair area. Apply: W.R. Meadows - Rezi-Weld Gel Paste State, Euclid - Euco #620 Gel Epoxy System, or Sika - Sikadur AnchorFix. Use the Rezi-Weld Gel Paste State when the air temp is above 60° F, or the Euco #620 Gel or Sikadur AnchorFix-4 when the air temp is above 33° F. Scrape off the excess repair material using a putty knife. Allow repair material to cure for 24 hours (48 hours in cold weather) before sanding, then feather sand the area.

Environmental Impact

- Swanson Group uses process by-products to produce energy
- Swanson products are renewable, biodegradable and recyclable

Air Quality and Safety

This product will generate wood dust from sawing, sanding, or shaping. Material Safety Data Sheets are available on the Swanson Group website at www.swansongroup.biz and upon request.

Structural panels (PS-1) are exempt from CARB regulations. However, this product contains no added urea formaldehyde and its 0.01 ppm formaldehyde level is lower than 0.05 parts per million, the lowest Phase 2 (2014) CARB formaldehyde limit, based on certified tests conducted in 2007 at an IAS accredited laboratory.

There's more than one reason Swanson Group® is #1 in the concrete forming industry. Find out more at www.swansongroup.biz

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SUSTAINABLE. RENEWABLE. RECYCLABLE
MADE IN THE USA

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