TULSAFORM MDO /*Form Work Plywood*

The Tulsa manufacturing plant is located in Concepcion in VIII Region of Chile.
Chile is famed for being one of the longest countries in the world, as well as the narrowest. It is made up extreme geographical and climatic conditions with the Atacama Desert in the North; and to the South is the beautiful but cold Tierra Del Fuego. The whole country is lined with the majestic Andes mountain range.

The company was established in 1994 as a joint venture between Chilean & American investors, with the purpose of producing & exporting Radiata Pine veneers and plywood. Tulsa currently produces 90.000 M3 of plywood per year.

Chile is a nation of forests, with over 5.5 million hectares of productive native forests, mainly Nothofagus hardwood species. Pine and Eucalyptus plantations cover 1.8 million hectares with an annual expansion rate of seven to ten percent.
Chile follows sustainable natural resource management practices, and as a result plants more trees than it cuts, thus ensuring their existence in the future as well preserving the quality of the land. Of these plantations 70% have management systems certified by ISO 14001, or are certified according to standards of sustainable forest management such as FSC or PEFC through the Chilean Standard Certforchile. 92% of Chile's plantations have been established in barren areas and areas without vegetation. This practice recovers land and protects the environment. Although the ratio between natural forest and plantations is seven to one, 89% of wood for processing comes from forest plantation. As TULSA only uses Radiata Pine, which is a total plantation species and not native of Chile, all of its wood is from plantation.

Radiata Pine, botanical name Pinus Radiata D. Don is characterized by the Yellowish white color of its wood, with slight color differences between its sapwood and heartwood. The growth rings produce a pronounced appearance. Radiata Pine has adapted so well to the climate of Chile that it grows much faster than in its native country. Today Chile has more than 1.4 million hectares of Radiata Pine plantations which are the basis of Chile's forest industry.

The majority of these plantations are young, which assures substantial volumes of wood products will be available for many years. Because of its fast growth rate, Radiata Pine forests react quickly and favorably to forest management practices which allow the species to be oriented to market needs. These forests are being carefully managed to produce larger diameter logs as well as a higher percentage of knot-free lumber from each tree. Through careful nursery and fertilization techniques, the next generation of Radiata Pine trees will grow even faster and have better yields than ever before.

Radiata Pine is used for a wide variety of structural architectural, and manufacturing needs. Products made from Radiata Pine include windows, doors, mouldings, furniture, timbers, decking, fencing, pallet materials, veneer, plywood, MDF products and particle board.

TULSA®

Valle Colcura S/N - Lota - VIII Región - Chile
www.tulsa.cl - info@tulsa.cl

FSC
Mixed Sources
Product group From well-managed forests and recycle wood or fiber

Cert no. IMO - COC - 23377
www.fsc.org

Product distributed by

CHARACTERISTIC

TULSAFORM MDO w/backer products are manufactured with 7 plies of 100% quality Radiata Pine veneers bonded together in a cross banded construction with phenolic resin. The panel is constructed with the face grain veneer parallel to the long edge of the board. The panel is overlaid with a phenolic impregnated kraft paper weighing 370 g/m2, and overlaid on the back with a Film 120g/m2 with a phenolic resin content of 35%. This phenolic film reverse acts as a moisture barrier to balance the composition of the panel. Tulsa overlay panels provide an exceptional high quality finish for hardness, water resistance and behavioural stability. With these characteristics Tulsa overlay panels are designed to allow the end user the opportunity to achieve a high number of re-uses. With correct site practice, storage, handling, care and treatment with appropiate chemical reactive release agents, contractors can achieve as many as 10 – 15 re-uses.

DESIGN DATA Film Information		Tolerances
Pack size	50 sheets	
Thickness of sheet	18 mm	+/- 0,4 mm
Dimensional tolerances		
Width	1,22 mm	+ 0/ - 1,6 mm
Length	2,44 mm	+ 0/ - 1,6 mm
Squareness	+/- 1,3 mm per meter	
Straightness	+/-1,6 mm	
Make up of product	radiata pine veneers	
Nº of plies	7	
Type of adhesive	phenolic resin	
Type of facing material	Radiata Pine veneer	
Anticipated number of reuses	10	
Overlay material	MDO 323 face and phenolic film back	
Overlay material weight		
MDO 323	370 g/m2	
Phenolic film	120 g/m2	

Sectional Properties (per m width)		
Area	17,9	10^3mm^2
Section Modulus (z)	53,4	10^3mm^3
Second Moment of Area	477,9	10^3mm^4

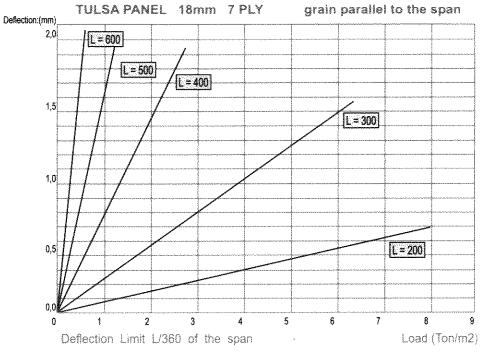
Bending stress, as follows:		
Parallel to the face grain	7,9	N/mm^2
Perpendicular to the face grain	4,91	N/mm^2

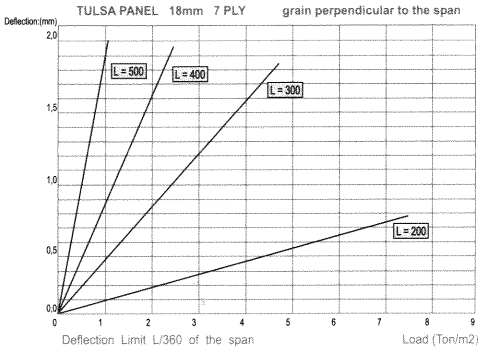
Modulus of Elasticity in bending, as follows		
Parallel to the face grain	5810	N/mm^2
Perpendicular to the face grain	3319	N/mm^2

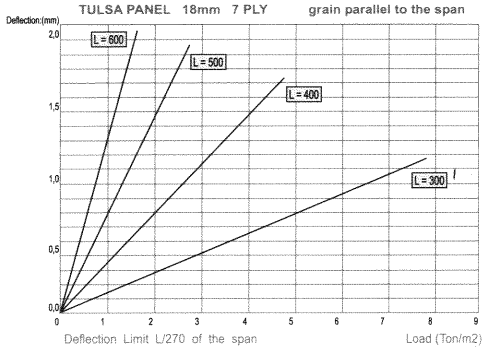
Moment of Resistance (fz)		
Parallel to the face grain	0,575	kNm/m
Perpendicular to the face grain	-	

Bending stiffness (EI)		
Parallel to the face grain	3,34	kNm^2/m
Perpendicular to the face grain	-	

Planar Shear Capacity (qa)		
Parallel to the face grain	12,2	kN/m
Perpendicular to the face grain	-	

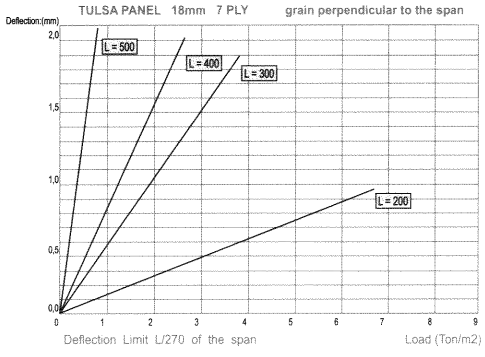






Support Spacing (mm)	Plywood Thickness allowable pressure (KN/m^2)			
	parallel to face grain		perpendicular to face grain	
	L/360	L/270	L/360	L/270
204	73,55	161,81	49,03	49,03
305	33,34	71,59	21,57	21,57
406	16,67	40,21	12,75	12,75
508	9,8	25,5	7,84	7,84
609	4,9	17,6	-	-

Nominal Thickness (mm)	Modulus of Elasticity (N/mm^2)		Modulus of Rupture (N/mm^2)	
	II to face grain	perp to face grain	II to face grain	perp to face grain
18	5810	3320	52,4	33



HUMIDITY

During its manufacturing panel humidity is controlled and stabilized to 8% moisture content.

QUALITY CERTIFICATION

Test for physical and mechanical properties are carried out daily by production and quality control teams, and are in accordance with standards set by North American testing agency TECO for exterior glue (WBP) to ensure that all products fulfill the standards and norms set in PS 1-95. Tulsa also tests their boards to current EU norms of EN 636:2 and EN 13986:2, and consistantly achieve a CE2+

Tulsa aware of its responsibility to future generations has taken the position of prudently using only renewable resources and developing processes that minimize waste materials and allow their reuse, thus becoming friendly to the enviroment FSC

TECHNICAL PROPOSITIONS OF USE

It is important for TULSAFORM MDO to be oiled twice before first use, and once thereafter before each successive pour.

- In work, store the panels on a flat and dry surface and under a roof or provisional cover, piling up them tidily on pieces of wood of 50mm x 50mm or 50mm x 75mm intransverse to the length.
- The panel comes from factory with its edges painted. If the board is cut and the wood exposed, this must be sealed with water resistant or rubberized paint, this will avoid any damage caused by capillary penetration of humidity.
- Use the appropriate form remover (same as recommended, chemical reactive releases for non porous surfaces)
- Although cleaning a Tulsa Overlay panel is much easier and quicker than traditional form material, it is important to only use fibre spatulas and synthetic materials when cleaning forms to prevent damage to the faces which might occur with metallic tools.
- Although TULSAFORM MDO 323 Overlay panels are very resistant to the abrasion and impact, as with any highly finished surface, care must be taken during cleaning and use to prevent damage. Always use the appropriate vibrators and techniques to protect the panels surface.

TULSAFORM MDO 323 Film Overlay panels are produced using low polluting emission Phenolic resins in accordance European E-1 norms. The glue line fully meets the requirements of exterior bonding class 3 to BS EN 314 – 2: 1993