



Material datasheet

Kebony Radiata

General Wood Quality

	Kebony properties	Reporting source	Notes
Wood Species	KEBONY – Radiata pine (<i>Pinus radiata</i>).		
Wood Quality	J10 or better for thickness 25mm and below For thickness from 25mm: J10 or better on 3 sides, J30 or better on one side	Purchasing specifications EN 942	Classification according to EN 942

Production Principles

	Kebony properties	Reporting source	Notes
Principles	<p>KEBONY – Wood materials are impregnated with a water-based furfuryl alcohol solution in a full-cell impregnation procedure. After impregnation the furfuryl alcohol is polymerized inside the wood cell walls by heating the material to between 160 and 250 °F, thus giving the treated wood a permanently altered and more rigid cell wall structure.</p> <p>The Kebony wood obtained by this process has a dark brown colour due to the formed polymer, and is harder and denser than the untreated wood.</p>	<p>KEBONY – Chemical wood modification with furfuryl alcohol polymerised inside wood cell walls.</p> <p>Lande S., Westin M. and Schneider M., Scand. J. For. Res. 19 (suppl. 5): 22-30, 2004.</p>	
Change from parent wood	Strong darkening of the wood due to chemical reaction of the furfuryl alcohol		No impairment of properties or workability.
Quality Assurance		Kebony Internal quality assurance system	
External method for determination of treatment	Determination of equilibrium moisture content, at 68 °F and 65 % RH, should yield values lower than 7.0 % when determined on samples that are first dried and then equilibrated at 65 % RH		



Physical Material Properties

	Kebony properties		Reporting source	Notes
Durability	Kebony Radiata	Radiata	SHR rep-8565 EN 113, Jan2010	Durability testing according to EN 113 and ENV 807
	Durability class: 1	Durability class 4-5	DTI report 651263-1, EN 84 and EN 113 - 2015	
	Assessment according to EN-350		DTI report 480564-4, ENV 807 - 2013	
Density at 68°F/65% RH	Kebony Radiata	Radiata	Report_4P05099B_Test of decking_Kebony Radiata	
	37...42 lb/ft ³	28...32 lb/ft ³		
Equilibrium moisture content (EMC) @ 68°F/65% RH	Kebony Radiata	Radiata	Internal tests (Kebony)	
	5.5 ... 6.5 % (adsorption)	11.3 ... 11.7 % (adsorption)	Based on more than 800 individual records	
Moisture content testing	Moisture content is determined by oven dry / weighing method (EN13183-1)			Standard moisture testing by electrical resistance is not suitable
Shrinking and Swelling	Maximum volumetric swelling ca 6		Internal tests (Kebony)	
	% swelling from dry to 95% RH	Kebony Radiata	Radiata	Based on more than 100 individual records
	radial:	0.7 .. 2.1	2.7 .. 4.1	
	tangential:	2.0 .. 3.7	6.0.. 7.4	
longitudinal:	0.2	0.3		
	%			
Fire class	NFPA/IBC CLASS B Flame spread 45 Smoke developed 250		ASTM Designation E84-15a	



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Thermal conductivity Thermal resistivity R-value, 1" product U-value, 1" product	0,15 W/mK 6,86 mK/W 0.169 m²K/W = 0.96 h ft² °F/Btu 5.92 W/m²K = 1.04 Btu/h ft² °F	Determination of thermal conductivity, November 2010, tested by SP Technical Research Institute of Sweden acc. to EN 12667. SP report 6P01922													
Bending strength (MOR) Small samples: Decking boards: 22x142 mm	9,900 psi (mean) 6,900 ... 12,900 psi 5,200 psi – characteristic value (lower 5% quantile)	SP Report 4P05099B - 2014													
Stiffness E-Modul	1,800,000 psi (mean) 1,368,000 ...2,232,000 psi	Testing of MOE and MOR SP Report 4P05099B	Joist span of 16" is recommended for all 22 mm Kebony radiata decking												
Pressure perpendicular to grain	3780 psi = 544 320 psf (max) 2639 psi = 380 016 psf (mean)	WSU report no CMEC16-001 - 2016													
Loading capacity Kebony Radiata decking, 22x142 mm (0.86x5.60 inch)	<table border="1"> <thead> <tr> <th>Span rating</th> <th>Evenly distributed load</th> <th>Point load</th> </tr> <tr> <th>Inches</th> <th>PSF</th> <th>lbf</th> </tr> </thead> <tbody> <tr> <td>16</td> <td>1480</td> <td>460</td> </tr> <tr> <td>24</td> <td>430</td> <td>250</td> </tr> </tbody> </table> <p><i>A safety factor of 2 is used on the low 5% MOR value.</i></p>	Span rating	Evenly distributed load	Point load	Inches	PSF	lbf	16	1480	460	24	430	250	SP Report 4P05099B - 2014	Calculations based on these values and limitations. Deflection limit, L/180 MOE: 1,800,000 psi MOR: 5,235 psi <i>MOR is low 5% quantile value</i>
Span rating	Evenly distributed load	Point load													
Inches	PSF	lbf													
16	1480	460													
24	430	250													
Surface hardness	Brinell hardness number: 4.2 Janka hardness: 1619 lbf	SP Report 4P05099B - 2014													
Slip resistance	Wet: R11, assessment group A	Baustoffprüfstelle Wismar GmbH test report no 1898/14	DIN 51097:1992-11 DIN 51130:2014-2												

Gluing

	Kebony properties	Reporting source	Notes
Suitability for glued construction	Recommendations for D4 gluing: Kebony recommends one-component PUR type glues	IFT Rosenheim reports no 12-0032344-PR05 and 12-0032344-PR06	Gluing of finger joints and laminated structures

Surface coating

	Kebony properties	Reporting source	Notes
Compatibility with coating systems	In general all acrylic based paints show good adhesion to Kebony wood. Alkyd based paints may have longer curing times on Kebony than on untreated wood.	SHR – Machinability, windows and doors; test report 11.0187-D Report / Prüfbericht 2010-114 from Buckhardt Institut der Georg August Universität Göttingen, Abteilung Holzbiologie und Holzprodukte, 37077 Göttingen	
Compatibility with fasteners	Metal fasteners for external use should be made from alloys that can tolerate pH down to 4.5, for example aluminium or stainless steel. Zinc or galvanized steel should be avoided.		

Machining

	Kebony properties	Reporting source	Notes
Machining	Previous testing indicated excellent properties /behaviour with respect to machining.	SHR – Machinability, windows and doors; test report 11.0187-D	Tests performed on SYP, similar machinability for Radiata
Dust protection	Dust development Exposure to dust should be avoided through the use of good ventilation and protective measures	SHR – Machinability and dust formation; test report 11.0187-C	Tests performed on SYP, similar machinability for Radiata

Waste Disposal

	Kebony properties	Reporting source	Notes
Disposal	Disposal - If disposed of or discarded, handle as untreated wood. No other toxic compounds are developed during incineration than those for untreated wood	SP report P105339 A/B Smoke gas analysis in combustion	ISO 5659-2 ISO 5660 Ref.: Kebony MSDS