Divinycell HCP

Technical Data

The high performance sandwich core

Divinycell HCP grade meets the demand for a high performance, low density buoyancy material with excellent characteristics. It is widely used in subsea buoyancy units, ROVs, diving bells and impact protection structures. As a result of its excellent hydraulic compressive properties and closed cell structure, it has very low buoyancy loss and water absorption under long-term loading conditions. The insulation properties of HCP are also good. HCP stands for Hydraulic Crush Point and is defined as the point of pressure in Bar, where the material when subjected to an increasing pressure of 1-2 Bar/sec has lost 5% of its initial volume. The design of subsea buoyancy applications is complex and consideration has to be given to the required buoyancy loss and updrift over the expected lifetime and service conditions, with respect to long and short term hydraulic compressive creep, water absorption and hydraulic fatigue. Please contact DIAB Technical Services for design proposal.

Mechanical properties Divinycell® HCP

Property	Test Procedure	Unit		HCP 30	HCP50	HCP70	HCP90	HCP100
Hydraulic Crush Point		**Bar**		**30-39**	**50-59**	**70-79**	**90-99**	**100-109**
Compressive Strength[1]	ASTM D 1621	MPa	Nominal	5.4	7.2	8.1	10.2	11.6
			Minimum	4.5	6.1	7.0	9.0	10.0
E-modulus (extensometer)[1]	ASTM D1621	MPa	Nominal	310	400	500	590	650
			Minimum	265	350	390	490	540
Tensile Strength[1]	ASTM D 1623	MPa	Nominal	7.1	9.2	11.0	12.6	13.5
			Minimum	6.3	8.0	10.0	11.5	12.2
Shear Strength	ASTM C 273	MPa	Nominal	3.5	4.5	5.2	6.5	7.3
			Minimum	3.2	3.9	4.2	6.0	6.5
Shear Modulus	ASTM C 273	MPa	Nominal	73	97	115	147	170
			Minimum	65	81	90	126	146
Shear Strain	ASTM C 273	%	Nominal	45	45	35	35	35
Density	ISO 845	kg/m^3	Nominal	200	250	310	380	410

All values measured at +23°C

1. Properties measured perpendicular to the plane

Nominal value is an average value of a mechanical property at a nominal density
Minimum value is a minimum guaranteed mechanical property a material has independently of density

Product Characteristics

- Excellent buoyancy performance
- High impact resistance
- Low water absorption
- Thermoformable
- Superior damage tolerance
- Fast and easy to machine
- Good chemical resistance
- High temperature resistance

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Technical Characteristics

Type	Buoyancy (kg/m³)	Operational depth[1] (m)	Crush depth (m)
HCP30	825	190	300
HCP50	775	300	500
HCP70	725	450	700
HCP90	665	550	900
HCP100	625	650	1000

1. Operational depth above is calculated with a max 5% buoyancy loss over 10 years operational time.
   Depth shown are for guidance only and can be optimized for indivicual conditions. Always contact DIAB for advice before selecting material.
   Buoyancy calculated from salt water (density 1025 kg/m³).

Technical Characteristics Divinycell® HCP

Characteristics[1]	Unit	HCP30	HCP50	HCP70	HCP90	HCP100	Test method
Density variation	%	+15/-10	+15/-10	+15/-10	+15/-10	+15/-10	-
Closed cells	%	>99	>99	>99	>99	>99	-
Thermal conductivity[2]	W/(m-K)	0.049	0.051	0.057	0.058	0.060	EN 12667
Coeff, linear heat expansion	$x10^{-6}$/°C	37	37	37	37	37	ASTM D 696
Continous temp range	°C	-200 to +80	-200 to +80	-200 to +80	-200 to +80	-200 to +80	-
Max process temp	°C	+90	+90	+90	+90	+90	-
Dissipation factor	-	0.0015	0.0020	0.0024	0.0030	0.0034	ASTM D 2520
Dielectric constant	-	1.25	1.32	1.39	1.47	1.53	ASTM D 2520

1. Typical values
2. Thermal conductivity at +10°C

Operating temperature is typically -200ºC to +80ºC. Normally Divinycell HCP can be processed up to +90ºC without dimensional changes.

Maximum processing temperature is dependent on time, pressure and process conditions. Therefore users are advised to contact Diab Technical Services to confirm that Divinycell HCP is compatible with their particular processing parameters.

Physical characteristics

Format		Unit	HCP30	HCP50	HCP70	HCP90	HCP100
Plain sheets	Length	mm	1730	1640	1410	1340	1310
	Width	mm	850	800	700	660	640
	Thickness	mm	56	53	30	27	23

Can be bonded to larger dimensions upon request.

Disclaimer:
This data sheet may be subject to revision and changes due to development and changes of the material. The data is derived from tests and experience. If not stated as minimum values, the data is average data and should be treated as such. Calculations should be verified by actual tests. The data is furnished without liability for the company and does not constitute a warranty or representation in respect of the material or its use. The company reserves the right to release new data sheets in replacement.

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