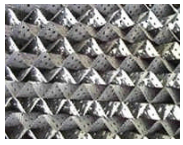
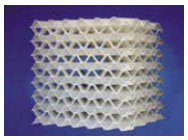
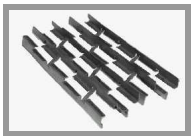
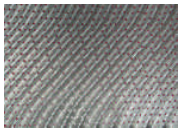
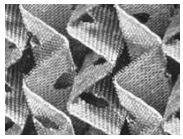
Structured Packing

OVERVIEW

Structured packing was first made commercially available in the 1980's and its distinct performance advantages became clear very quickly leading it to transform the mass transfer market over the next 10 years. It is now the preferred packing for many applications.

HAT's **AlphaPACK™** structured packing is formed from vertical sheets of corrugated metal with the angle of the corrugations reversed in adjacent sheets to form a very open structure with inclined flow channels. To simplify installation, it is delivered in pre-formed slabs or segments that are sized to fit through the vessel manways. A high surface area will only provide efficient mass transfer if it is effectively used to increase vapour-liquid contact and therefore a variety of surface enhancements are employed to promote liquid spreading over the packing surface. The low resistance to vapour flow together with efficient use of available surface tends to give structured packings significant performance advantages over random packings in high vapour rate/low liquid rate systems.

HAT have had many years of engineering experience with a variety of structured column packings going right back to the earliest industrial applications. Resulting from this experience, we have developed the **AlphaPACK** range of structured packings in order to be able to engineer systems that provide optimum column performance.

Standard Range:		**Types D and M** (Sheet Metal Packing)
		**Type T** (Plastic Packing)
		**Type GG and MG** (Metal Grids)
High Performance Range:		**Type DHC** (High Capacity Metal Packing)
		**Type G** (Metal Gauze Packing)

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AlphaPACK Type D structured packing uses the industry standard corrugated perforated and embossed sheet metal design to provide efficient vapour-liquid contact. The style of the embossed surface has been optimised to provide maximum wetability and numerous perforations enhance cross mixing of the process fluids. Type DS has a crimp angle of 45° and type DH 60°. Suitable liquid irrigation range from below 0.5 up to 200 $m^3/m^2.hr$.

Type M is the HAT generic name for replica structured packing where a customer requires an exact replacement of another brand and where this is permitted under local and international copyright and patent laws.

Type T is a Thermoplastic version of D-Pak for use in corrosive or air services. Available with 45° and 60° crimp angles in materials such as PVC, PVDF and Polypropylene.

Type GG is an open grid pack similar to Glitsch Grid for use in corrosive, viscous and/or fouling services such as refinery vacuum columns.

Type MG is a low surface area, high free area structured grid pack without surface embossing or perforations and is suitable for similar applications to Type GG where the fouling is less severe or where improved performance is required.

Type DHC is a high performance version of type D utilising shaped corrugations rather than plain linear crimps. The curved style of currugation means that the fluids have more opportunity to mix and the capacity is boosted because of a lower pressure drop. It is suitable for use in clean services.

Type G is a corrugated wire gauze style of packing to provide the most efficient packing surface required for fine chemicals separations, usually at lower pressures.

Type GG and MG grids have low surface areas (below $100m^2/m^3$). The D and M type packings can be produced with specific surface area ranging from 100 to $350m^2/m^3$ by variation to the corrugation size. Type DHC has an area of 350 to $500m^2/m^3$. Type G can be produced from $500m^2/m^3$ to more than $750m^2/m^3$ with T-Pak having a specific surface area of $300m^2/m^3$.

AlphaPACK structured packings are installed in layers approximately 210mm high with adjacent layers rotated through 90 degrees. This provides 33% more interfaces than most other types of structured packing which results in more uniform vapour/liquid distribution. In addition, a unique wall wiper band located around the centre of each layer provides an effective seal and directs liquid from the vessel wall back into the packing.

Structured packing has been employed in a wide range of systems around the world from which an extensive performance data bank has been established. We have developed design software based upon empirical correlations derived from substantiated performance data to predict reliable pressure drops, flood limitations and separation efficiencies for most systems of commercial interest. The following table provides some typical performance characteristics for **AlphaPACK** structured packings.

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AlphaPACK STYLE	SURFACE AREA (m^2/m^3)	CAPACITY FACTOR	H.E.T.P.* (mm)
D-100S	100	0.181	800
D-125S	125	0.175	625
D-150S	150	0.160	500
D-200S	200	0.150	400
D-250S	250	0.140	360
D-300S	300	0.121	275
D-350S	350	0.115	260
D-100H	100	0.225	1500
D-125H	125	0.215	1250
D-150H	150	0.200	750
D-200H	200	0.188	600
D-250H	250	0.175	500
D-300H	300	0.148	410
D-350H	350	0.140	370
G-500S	500	0.115	165
G-750S	750	0.075	100
T-300S	300	0.121	500
DHC-252S	250	0.175	250
MG-40S	40		
MG-64S	64		
MG-64H	64		
MG-90H	90		

* Actual HETP will depend upon system properties and load factors. The data listed is based upon the Chloro-/Ethyl Benzene system under vacuum conditions and is provided for comparison purposes only.

HAT International

AlphaPACK® DESIGN SHEET

Structured Packing

AlphaPACK STRUCTURED PACKING SPECIFICATION CHART

Packing Style	Material	Application	Crimp Angle	Surface Area	Voidage	Closest Equivalent Styles (similar capacity/efficiency)		
				m^2/m^3	%	Glitsch	Norton	Sulzer
D-100S	Sheet Metal, embossed	General (high capacity)	45°	100	98	-	-	-
D-125S	Sheet Metal, embossed	General (high capacity)	45°	125	97.5	1A	4T	125Y
D-150S	Sheet Metal, embossed	General (high capacity)	45°	150	97	1.5A	3T	-
D-200S	Sheet Metal, embossed	General	45°	200	98	-	2T	-
D-250S	Sheet Metal, embossed	General	45°	250	97.5	2A	1T	250Y
D-300S	Sheet Metal, embossed	High efficiency	45°	300	97	3A	-	-
D-350S	Sheet Metal, embossed	High efficiency	45°	350	96.5	-	-	350Y
D-100H	Sheet Metal, embossed	High Liquid Capacity	60°	100	98	-	-	-
D-125H	Sheet Metal, embossed	High Liquid Capacity	60°	125	97.5	-	-	125X
D-150H	Sheet Metal, embossed	High Liquid Capacity	60°	150	97	-	-	-
D-200H	Sheet Metal, embossed	High Capacity	60°	200	98	-	-	-
D-250H	Sheet Metal, embossed	High Capacity	60°	250	97.5	-	-	250X
D-300H	Sheet Metal, embossed	High Capacity	60°	300	97	-	-	-
D-350H	Sheet Metal, embossed	High Capacity	60°	350	96.5	-	-	350X
DHC-252S	Sheet Metal, embossed	High Performance	45°	250	95.5	-	-	M252Y
G-500S	Wire Gauze	High Efficiency	45°	500	93.5	-	-	-
G-750S	Wire Gauze	High Efficiency	45°	750	90	CY	-	CY
G-500H	Wire Gauze	High Efficiency	60°	500	93.5	BX	-	BX
G-750H	Wire Gauze	High Efficiency	60°	750	90	-	-	-
T-300S	Thermoplastic	Corrosive	45°	300	85	-	-	-