

ENGINEERED LIFT OPTIONS

Marlow's fibre rope solutions for engineered lifting are all customised and made to order to meet the bespoke requirements of every project. In most cases our D12+ Dyneema® product is the best rope solution thanks to its high strength, light weight and safety characteristics. Manufactured in various SK fibre options, this high performing high modulus polyethylene is a superior alternative to wire rope. All customised lifting slings are available in the following options:

SLING SET UP OPTIONS:

SINGLE LEG SLING SET-UP	GROMMET SLING SET-UP
For given rope diameter, sling is lighter weight. Better material efficiency for longer lengths	Higher breakload for given rope diameter. No length restrictions (shorter slings realise full strength)
Thimbles can be used to protect bearing point and maintain efficient D:d ratio at bearing points. Without thimble, attention must be given to diameter of object over which splice will sit - must be no more than 37% of the length of the spliced eye	Minimum D:d ratio of 3x rope diameter is recommended for object on which sling will sit
Easily used in basket configuration for 2x break load	Use of thimbles not recommended due to nature of construction
Minimum length restriction to maintain optimum strength realisation (usually 35x rope diameter between ends of each splice)	Option to seize legs of grommet sling together for easier handling. Option to cover legs of grommet sling in braided jacket or other chafe protection.
Eye protection (chafe gear) can be incorporated	Eye protection (chafe gear) can be incorporated

TECHNICAL FIBRE OPTIONS:

FIBRE	CHARACTERISTICS
HM12+ (HMPE)	Generally lower tenacity than SK75
D12+ 75 (DYNEEMA® SK75)	Standard grade Dyneema® high quality, low stretch
D12+ 78 (DYNEEMA® SK78)	Same stretch as SK75, but lower creep and Bio-based as standard
D12+ 99 (DYNEEMA® SK99)	Premium high strength Dyneema® fibre - ~ 20% higher strength than SK75 or SK78
D12+ Max 20 (DYNEEMA® DM20)	Designed specifically for more permanent loads as exhibits virtually zero creep

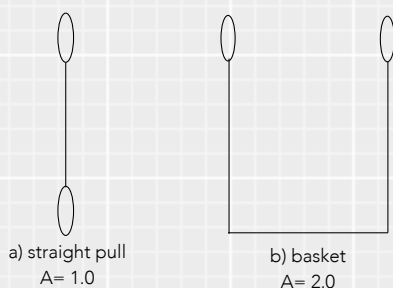
The below diagram shows the Working Load Limit (WLL) calculations of a fibre rope sling

$$\text{WLL of spliced rope} = \frac{\text{spliced breaking force of rope fibre}}{\text{coefficient of utilisation}} \times \text{assembly factor A}$$

Where:

- The breaking force is expressed in kN
- The coefficient of utilisation is 7 (EU) OR 5 (US) according to ISO 18264
- The assembly factor is explained below
- The same assembly factor is used for grommet configurations

1) Single strop and grommet



2) multiple fibre rope leg sling (assume $\beta = 45^\circ$)

