12. Parafil® Terminations

12.1 Overview and Function

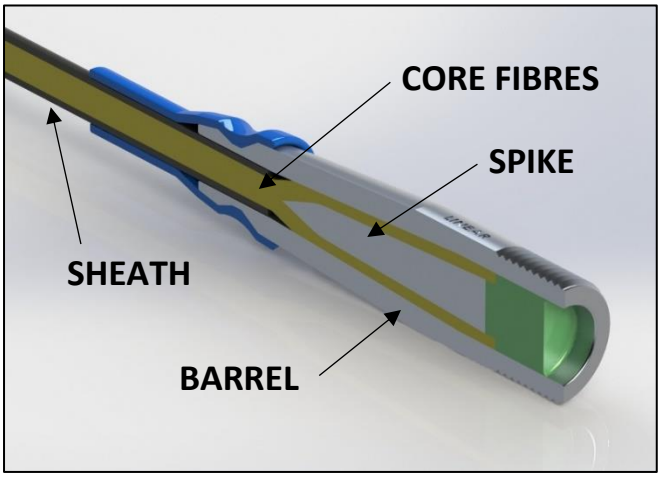
Parafil® ropes contain a parallel laid fibre core which is solely responsible for the mechanical strength and performance of the rope.

In order to efficiently transmit forces into all of the core fibres, in a reliable manor, it is necessary to use proprietary Linear Composites Terminations.

These Terminations are individually designed by Linear Composites, with each Termination, specifically matched to a given rope. The Terminations allow efficient and repeatable transmission of forces exceeding 100% of the rope NBL.

The Termination technology relies on two main components the 'Barrel' and the 'Spike' as shown in Figure 20.

Figure 20 ~ Barrel and Spike Terminations



The Barrel is the outer annulus and it features a tapering central hole. The Spike is a two-part tapering conical wedge which sits centrally within and axially parallel to the Barrel taper. In operation the core fibres, which are equally distributed around the Spike, are trapped between the outer surface of the Spike and the inner surface of the Barrel taper by friction alone. No bonding of the fibres is required and no additional compounds or materials are required to allow successful operation of the Termination.

Terminations are supplied in three main forms: 1) "Fork", 2) "Eye" and 3) "Pre-Stressing" pictured below in Figures 21a, 21b and 21c respectively.

Figure 21a

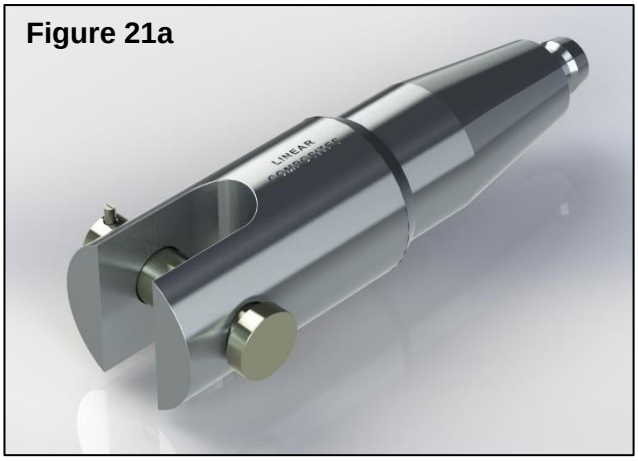
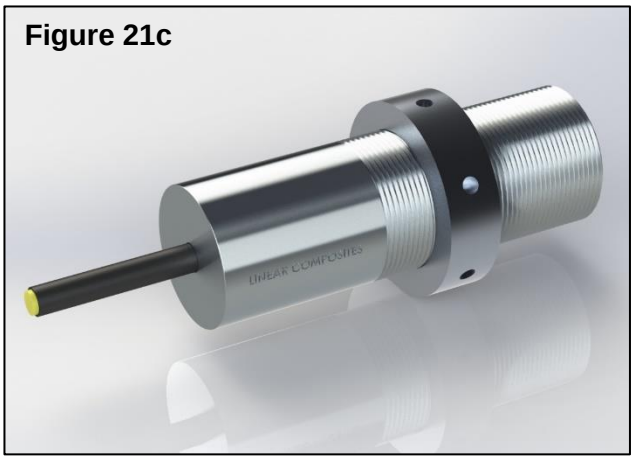


Figure 21b

Figure 21c



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12.2 Termination Fitting

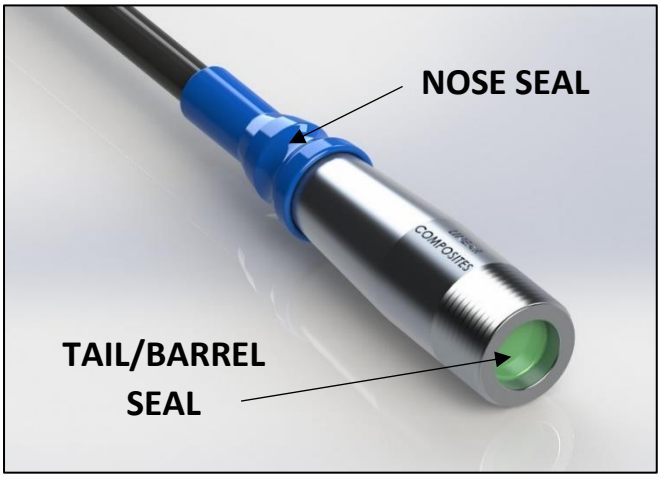
Linear Composites Parafil® Terminations must be fitted in strict accordance with the instructions document, issued with the Terminations.

A critical stage in the fitting process is a tensile pull on the assembled rope-Termination system. This stage is necessary in order to ensure a firm grip between the Barrel, Spike and core fibres and also to prevent any further dimensional change in the 'eye-to-eye' length of the terminated rope.

The final stage in the Termination fitting process is the application of water sealing systems (where required). It is good practice to take steps to prevent ingress of water into Terminations used on aramid fibre Parafil® ropes. The sealing is applied to two regions the junction between the 'nose' of the Termination and the rope and into the 'tail' end of the Barrel as shown in Figure 22. The nose seal is made of two components, a short length of silicone rubber which is over-wrapped by self-amalgamating tape while the tail seal is typically formed using a proprietary silicone mastic compound.

Full details on the Termination fitting process, along with proprietary seal product specifications are contained in the relevant Linear Composites product manual which is available on request.

Figure 22 ~ Parafil® Termination Sealing



12.3 In-Use Inspection

As with all engineering equipment, Parafil® ropes and Parafil® rope + Termination assemblies should be inspected on a regular basis for signs of mechanical damage, deterioration or corrosion of terminations.

The frequency of the inspections will depend on the location and the local environment and must be defined at design stage by the relevant specifying engineer. It is however, recommended that the inspection frequency should be no less than once per year.

A suggested minimum inspection protocol is shown in Table 8 however, different sites and different application areas will require other additional considerations.

Table 8 ~ Minimum Parafil® and Termination Inspection Protocol

Condition severity	Sheath condition	Termination condition	Action
Undamaged	Smooth black surface	No visible corrosion	No action needed
Slight/ moderate Damage	Abrasion or cutting of rope sheath – core fibres NOT visible	Light scratches, slight corrosion or damaged seals	Repair sheath, replace seals apply corrosion inhibitor to Termination
Severe Damage	Abrasion or cutting with core fibres exposed/ visible or damaged	Extensive mechanical damage, heavy corrosion, penetrative cracking	DO NOT USE rope assembly must be replaced.

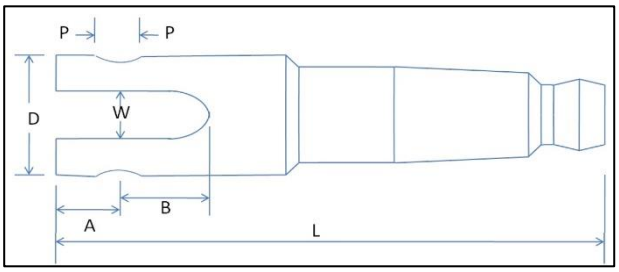
12.4 Design Life and Maintenance

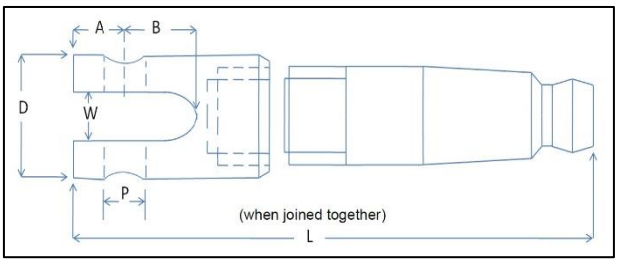
Parafil® ropes, combined with Linear Composites Terminations have proven track records of achieving continuous-service working lives of in excess of 40 years without the need for significant maintenance operations. Terminations are available in a variety of material types in order to match weight and environmental/corrosion resistance requirements.

12.4 Type A Parafil® Termination technical dimensions

Standard Type A Parafil® rope Terminations are made in a “one-piece” body design up to 30 tonne N.B.L. Beyond this N.B.L. the Termination body is composed of two separate parts. A key to the stated dimensions are shown in figures 23a (one-piece fork design) and 23b (two-piece fork design).

Rope Size	Termination Dimensions						Approximate Assembly weight including seals etc	
NBL Tonnes	L mm	D (Dia) mm	P (Dia) mm	W mm	A mm	B mm	Aluminium Alloy Kg	Steel Kg
0.5	79	19	6.4	7	8	13	0.04	0.11
1.0	98	22	8.0	8	10	16	0.10	0.17
2.0	123	30	9.6	10	12	19	0.15	0.34
3.5	156	38	12.7	17	16	25	0.33	0.63
5.0	188	44	16.0	20	20	32	0.48	1.13
7.5	224	54	19.1	23	24	38	0.79	1.45
10	254	60	22.3	26	29	44	1.16	1.87
15	305	76	25.4	33	32	51	2.10	2.75
20	340	86	28.6	36	36	56	2.95	5.22
30	416	102	38.1	42	48	76	5.40	12.8

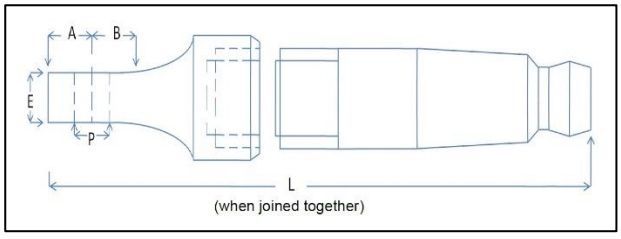


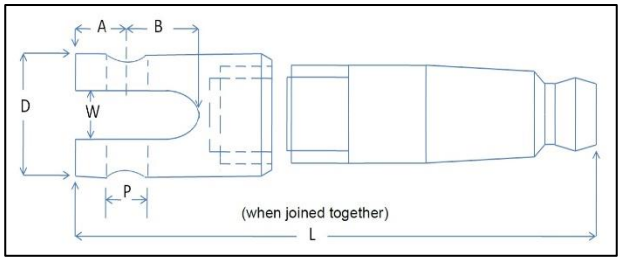


12.4 Type F and G Parafil® Termination technical dimensions

Standard Type F and G Parafil® rope Terminations are all made in a “two-piece” body design (except for the strengths marked with an *). A key to the stated dimensions are shown in figures 24a (two-piece fork design) and 24b (two-piece eye design).

Rope Size	Termination Dimensions						Approximate Assembly weight including seals etc	
NBL Tonnes	L mm	D (Dia) mm	P (Dia) mm	W mm	A mm	B mm	Aluminium Alloy Kg	Steel Kg
0.75*	74	14.2	5	4.5	6.5	13	0.03	N/A
1.5*	92	25	8	8.5	10	16	0.09	0.23
3.0*	132	38	12.8	17	16	25	0.25	0.57
4.5	151	41	15	18.5	18	29	0.33	N/A
6.0	168	44	16	20	20	32	0.45	1.1
10.5	225	60	22.4	26	29	44.5	1.0	2.4
15.0	257	76	25.5	33	32	51	1.6	4
22.5	305	83	28.7	36	36	56	2.4	6.1
30.0	371	102	38	42	48	76	4.9	12.25
45.0	440	127	44.7	48.3	57.4	89.4	8.4	N/A
60.0	501.36	146	51.2	55	63.5	101.6	13	N/A





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