

# Custom Composites Long Reach Pole

## Developed for hazardous material handling in the nuclear decommissioning industry

- **Lightweight** – the carbon fibre pole is easier for the operator to manipulate
- **Extremely strong** – can be manufactured to specific load requirements
- **Extendable** – interlocking lightweight poles
- **Interchangeable tools** – accommodates different tools and camera systems
- **UK manufactured** – to the highest quality / standards

### PHYSICAL PROPERTIES

For operators manipulating low level nuclear waste who struggle to use traditional heavy pond poles, Custom Composites carbon fibre version is a lightweight yet strong operating pole that enables more waste to be manipulated within the exposure window.

Unlike steel poles, which are expensive, tiring to use and difficult to operate, our variant is more cost effective, easy to install and use.

- Carbon Fibre is built up in layers – different orientations of fibres within the different layers give the pole its unique properties & strengths, we can manufacture tubes based upon load requirements, specific to your application.
- Custom Composites carbon fibre poles can be supplied with a range of adapters for different tools and camera systems and are being used at Nuclear sites across the UK & Europe.
- Further to this Custom Composites poles have been adapted by several ROV & Robot manufacturers looking for strong yet lightweight manipulation arms.

Pole Material	Carbon Fibre / Epoxy	
Pole Outside Diameter	40mm	
Pole Assembly Weight	1.0m pole	0.59kg
	1.5m pole	0.81kg
	2.0m pole	1.03kg
	3.0m pole	1.48kg

## MECHANICAL PROPERTIES

Working Temperature	-20 / +60 deg C
Max working torque	25Nm
Max tensile working load	500kg (pole assembly vertical)

### Max Bending (Lifting) Loads

The following table gives the max bending (lifting) loads with the pole assembled at an angle, based on loading as a cantilever – one end fixed.

The Figures show the max load in Kg at the free end of the pole and the angle of the pole assembly.

Pole Length	90 deg	60 deg	45 deg	30 deg
1 metre	156	180	220	311
2 metre	78	90	110	156
3 metre	52	60	73	104
5 metre	31	36	44	62
10 metre	16	18	22	31
15 metre	10	12	15	21

Max loads based on 25% of ultimate bending failure load

### Buckling Failure Loads

The following table gives buckling failure loads, with the pole vertical – end constraints assumed pinned/pinned.

Pole Length	P (N)	P (kg)
2 metre	10389	1059
3 metre	4617	470
5 metre	1662	169
10 metre	415	42

Note:

Due to limitations in buckling theory for vertical struts the safe working loads should be 50% of the above calculated loads for single section poles and 25% for multi-section poles.

Care must be taken with the calculated results. This calculation is limited as it is assumed that the pole is initially perfectly straight and homogeneous – in practice this is not the case and safety factors should be applied to the calculated results. A reduction of at least 50% for single section poles and 75% for jointed sections is suggested for safe working load.

