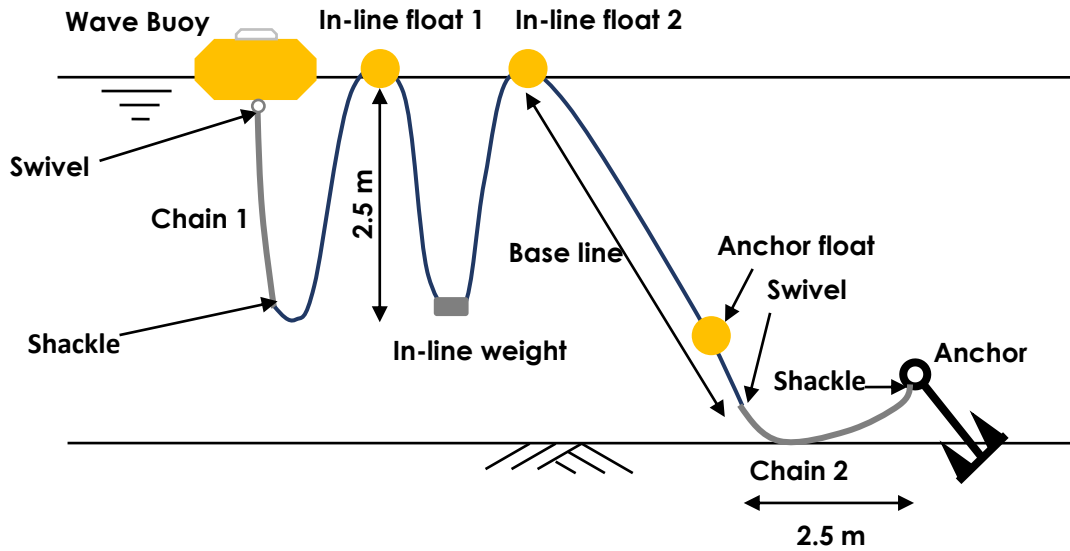


### WAVE BUOY MOORING DESIGN GUIDELINE<sup>1</sup>

Waves and ambient currents will lead to tensile forces on the mooring line of any buoy. In order to allow the Obscape Wave Buoy to still move with the wave orbital motion, a system of in-line weights and floats is needed. The recommended general mooring design is shown in the figure below. The table gives the specifications of all components, partly depending on the expected maximum current speed and water depth.



<sup>1</sup> The mooring design guideline is provided for reference and are based on the experience of Obscape staff. Obscape and its associated companies do not take responsibility for practical performance of mooring lines.

Component	Specification		
Line <sup>2</sup>	Diameter: $\geq 16$ mm  Base length = $1.2 * \text{Mean water depth} + \text{High Water level} + \text{Surge} + 0.5 * \text{maximum wave height}$ Total line length = base length + $3 * 2.5$ m  For deep moorings, it is advised to increase the depth of the in-line weight and length of chain 1 from 2.5 m to 5 m (depth > 30 m) or 10 m (depth > 100 m).		
Anchor float	0.5 L		
Swivels & shackles	Stainless steel, min. 8 mm diameter		
	<b>Currents max. 0.5 m/s</b>	<b>Currents 0.5 – 1 m/s<sup>3</sup></b>	<b>Currents 1 – 1.5 m/s<sup>3</sup></b>
In-line float 1 and 2	$\geq 5$ L	$\geq 10$ L	$\geq 10$ L
In-line weight	1.5 kg	2 kg	3 kg
Anchor (< 30 m depth)	15 kg	20 kg	40 kg
Anchor (> 30 m depth)	30 kg	40 kg	80 kg
Anchor (> 100 m depth)	45 kg	60 kg	120 kg
Chain 1	1.5 kg/m	2.0 kg/m	2.5 kg/m
Chain 2	1.5 kg/m	2.0 kg/m	2.5 kg/m

**Please note:**

- Chain 1 should not be replaced by a normal line, as it is important for optimal wave buoy dynamics.
- Chain 2 is needed to keep anchor forces as much as possible parallel to the sea bed. This will stimulate anchor burrowing.
- The anchor float is needed to prevent the line from dragging over the sea bed. This will prevent excessive wear of the line. The anchor float needs to be able to resist water pressure at sea bed level. Therefore, a solid anchor float (e.g. foam) is to be preferred over a hollow anchor float.
- The recommended anchor weights in the table are based on steel ship anchors in a sandy sea bed. For gravity anchors, significantly higher submerged weights are advised. For non-sandy substrates, it is advised to seek local experience and advice.
- For long-term deployments and/or energetic environments, it is advised to increase the mooring line diameter. Regular checks of the mooring line condition may help to prevent mooring line failure.

<sup>2</sup> When determining the water depth from sea charts, be aware that these typically report water depth w.r.t. lowest astronomical tide rather than mean water depth.

<sup>3</sup> The Obscape Wave Buoy buoy functions optimally in currents < 0.5 m/s. Performance may be compromised at higher ambient flow velocities.