

Crane Sizing Guide

Seatrax often receives inquiries such as, “We need a 100-ton crane”. However, the maximum lift weight to be lifted only partially defines the crane size. In fact, because the offshore crane is fixed to the host structure, the distances from the crane at which various loads are to be lifted are more likely to determine the crane size rather than the maximum weight the crane will lift.

In addition, lifting a load off of a supply boat pitching in waves (offboard Lift) is treated differently than lifts from the deck of the installation the crane is mounted on (onboard Lift). Offboard/supply boat lifts have the potential to impose impact loads on the crane that are not experienced during onboard/deck lifts. Therefore, the offboard supply boat capacity is reduced from the onboard deck lift capacity. The table below lists the API Specification 2C ratings for typical Seatrax crane models. The various columns are categorized by capacity or ratings basis, specifically:

- Red column—the theoretical weight that can be suspended from the boom tip with the boom lengths and radii shown without exceeding the API 2C allowable stresses for onboard lifts from a bottom-supported structure.
- Blue column—the maximum weight that can be lifted with the hoists and wire ropes normally supplied for the boom lengths and radii shown in full compliance with API Specification 2C for onboard lifts from a bottom-supported structure.
- Green column—the maximum weight that can be lifted in full compliance with API Specification 2C, for the boom lengths and radii shown, for offboard supply boat lifts, with a significant wave height of 7 feet and a 30-knot wind, from a bottom-supported structure. The boom foot pin elevation is assumed to be 110 feet above the water.

Seatrax Ratings-Tons

Crane Model	API Max Structural SWLH			API Onboard SWLH			API Offboard SWLH		
	Rated Tons	Boom Length	Matching Radius	Max Lift Tons	Boom Length	Matching Radius	Max Lift Tons	Boom Length	Matching Radius
S4820	100	60	15	55	80	20	30	80	20
S4824	135	60	15	55	80	25	35	80	20
S5620	165	60	15	85	100	20	40	100	20
S5624	190	60	15	85	100	25	45	100	20
S5626	195	60	15	85	100	30	45	100	25
S7224	255	60	20	115	120	30	65	120	25
S7226	275	60	20	115	120	35	70	120	30
S7228	280	60	20	115	120	40	70	120	35
S7232	285	60	20	115	120	50	70	120	40
S9024	365	80	20	240	140	30	105	140	35
S9028	370	80	20	250	140	30	110	140	40
S9032	395	80	25	255	140	30	115	140	40
S9036	405	80	25	260	140	30	120	140	45
S9040	415	80	25	265	140	30	120	140	50
S10828	480	80	25	300	160	35	145	160	50
S10832	510	80	30	310	160	35	155	160	55
S10836	515	80	30	315	160	35	155	160	60
S11532	600	100	25	395	180	35	185	180	50
S11536	625	100	30	400	180	35	190	180	55
S11540	635	100	30	410	180	35	195	180	60
S12648	895	100	35	600	180	35	245	180	80

*All tons are short tons of 2,000 lbs. All boom lengths are in feet. All radii are in feet.



Using the “100-ton crane” example, let’s take a look at the **red columns**. The Seatrax S4820 carries the 100-ton structural rating at minimum radius with a 60-foot boom. However, if the purchaser wants to lift 100 tons from a supply boat, the minimum crane size from the **green offboard columns** will be in the range of the much larger Seatrax S9024, since that crane is the minimum sized model with at least a 100-ton rating.

It is also important to note that numerous parameters will cause the **green offboard ratings** in the table to increase or decrease. Examples of these parameters include boom length, significant wave height, wind forces and how high the crane is above the water. In the case of floating installations, accelerations and inclinations additionally impact both the **blue onboard** and **green offboard columns**.

For a purchaser to ensure they purchase the correct crane for the job, providing the following is the best way to start:

The type of structure upon which the crane is mounted (i.e. bottom-supported, semi-submersible, ship-hulled, etc.)

- Boom length
- The magnitudes of the various loads and distances relative to the crane. (i.e. on the installation deck as well as how close the supply boats can be positioned)
- The environmental conditions the crane will operate in (i.e. significant wave height and wind)
- The height of the crane above the water