

The Great Light

A Lighthouse Optic

What is the Great Light?

The Great Light is a lighthouse optic which was housed in the lantern room at the very top of the lighthouse. It is made up of a base with two tiers of lenses (biform). In each tier there are four lenses and two blank panels arranged in a hexagon formation. The lenses were designed to focus and magnify the light into a very powerful beam to warn shipping of rocks and hidden hazards. These lenses produced one of the strongest lighthouse beams ever made, so we have called it the **GREAT LIGHT**. It belongs to the Commissioners of Irish Lights and is on loan to Titanic Foundation until 2116.

Why is it special?

This optic is special because of the size and age of the lens panels, together with the unusual fact that these lenses served two lighthouses. The lenses are the largest Fresnel lenses ever made, called Hyper-Radial. They are part of the world's first Hyper-Radial optic made in 1887, for Tory Island Lighthouse. In the 1920s, the Tory Island optic was split and the lenses were used, with new pedestals, to create two optics for the lighthouses on Tory Island and Mew Island. They are very rare. Only 30 optics around the world had these huge optics and only 20 are left. The Great Light and its twin on Tory Island, are the only two Hyper-Radial biform optics left in the world.

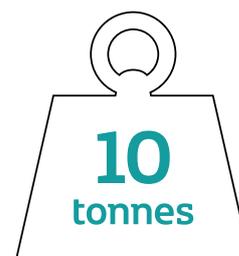
How big is it?



The optic is

**7m tall,
3m wide**

and weighs

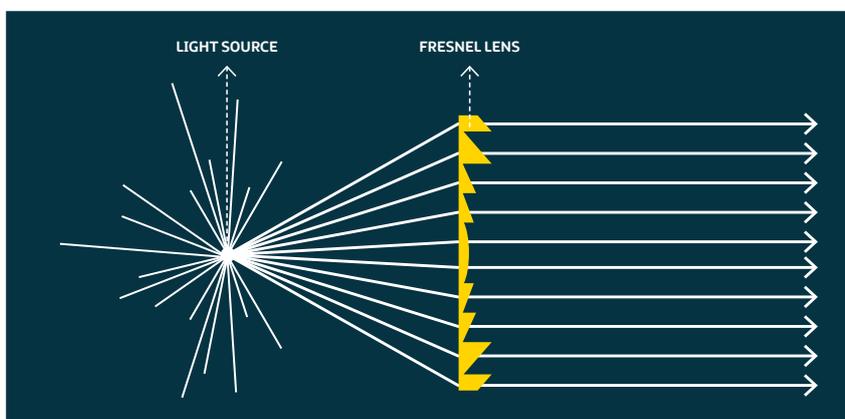


**Each lens is 158cm wide
x 73cm high, 7.7cm thick**

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How does it work?

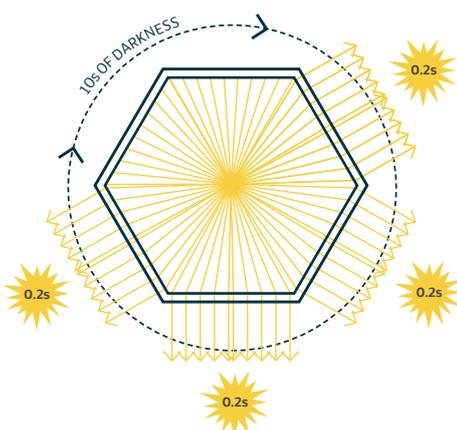
In the middle of each tier there is a light. The light travels through each lens and is magnified by the central bull's eye. The concentric rings on either side refract (bend) the light into a straight beam. This is a Dioptric lens, which means the light is refracted twice - once on entering the lenses and once on leaving it.



How does it rotate?

Today, the pedestal and lenses are being rotated by a turntable installed in the floor of its specially designed glass enclosure on the Titanic Walkway, Belfast. When the optic was first in the lighthouse a clockwork mechanism (like the one between the pedestal's legs) would have turned the upper part holding the lenses, while the pedestal was still. In 1964, the clockwork mechanism was replaced by an electric motor.

Why does it rotate?



At night the sequence of flashes told mariners which lighthouse they could see, as each lighthouse has a different sequence (or character). This optic rotates once every 30 seconds. At a distance you would see a sequence of four flashes of 0.2 seconds, with a 4.8 seconds dark period between each flash, as the optic rotates between panels. It would be dark for 10 seconds when the two blank panels mask the light. Now the Great Light only flashes at night on very special occasions, to avoid confusing ships in the port.

In the lighthouse, the rotation of the lenses would be stopped at dawn. The lantern room blinds would be drawn to protect the lenses from sunlight being magnified inside the optic and causing a fire. On site, the Great Light continually rotates during the day to avoid this hazard. Emergency blinds will come down if the turntable stops.