

This document covers the progress of my display tank throughout the years.

The timeline is split in three major sections:

[The development and introduction of CoralCare Gen 1 \(2016\)](#)

[The development and introduction of CoralCare Gen 1.1 \(2018\)](#)

[The development and introduction of CoralCare Gen 2 \(2020\)](#)

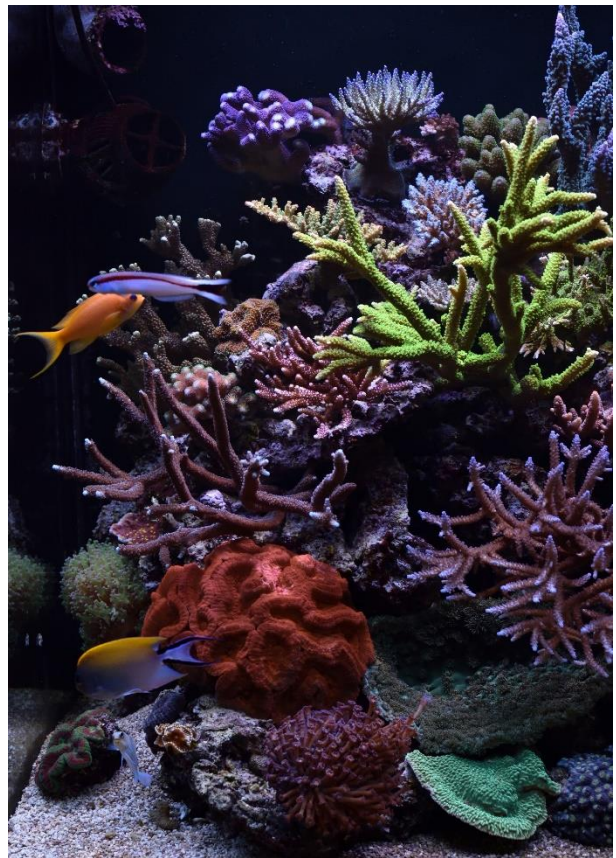
The development and introduction of CoralCare Gen 2 (2020)

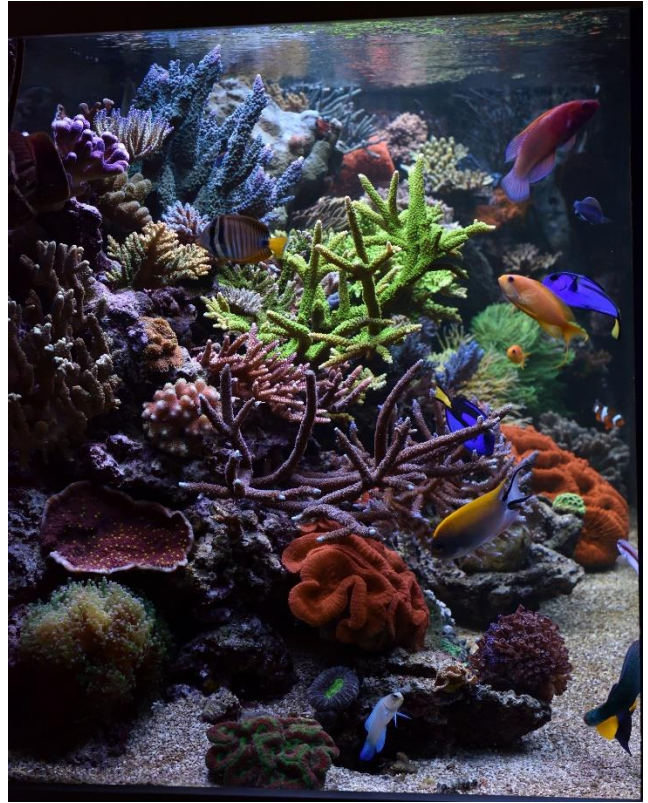
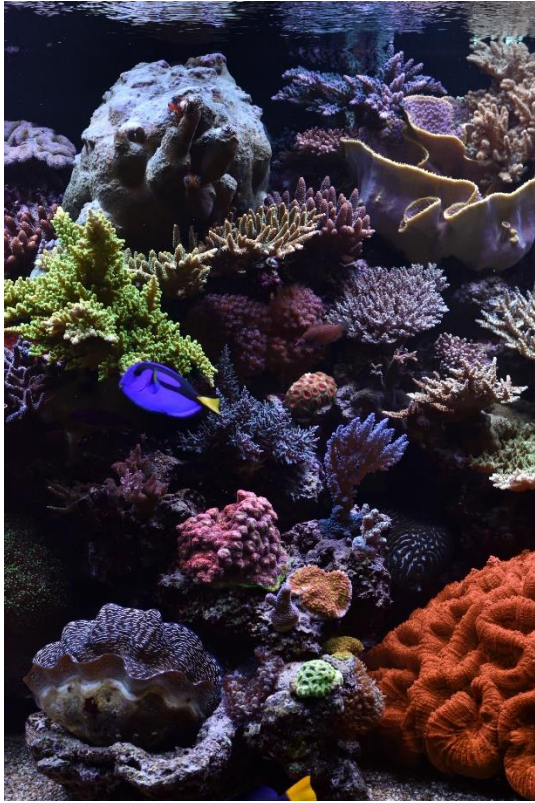
At the end of 2018 we received the approval to work on an improved and slimmer version of the Philips CoralCare product. Next to the changes in the housing design, we also took into account feedback from our CoralCare Gen1 users in order to improve the Gen2 even further. Positive aspects of the Gen1 such as passive cooling, easy maintenance and high-quality components remain unchanged. As for the LED board and spectrum, some changes were made in order to again guarantee a state-of-the-art product. This resulted in a PCB with 68 LEDs and as a consequence we also needed a new optical system. We wanted to build on the strength of our existing optical design (excellent homogeneous distribution) but also add some additional features such as improved light dynamics. We managed to integrate a color temperature dependent dynamical light effect to the product which mimics a natural behavior perceived on the ocean floor. It is a subtle effect achieved by carefully positioned LED's and patterns in the front glass. By smartly grouping and distributing the LED's we also managed to create a larger active source with a smoothened peak intensity in the middle; allowing to install the fixture closer to the water surface. Finally, we also updated our CoralCare controller. It now includes controllability via an app and has a water resilient housing so that it can be installed close to the fixtures.

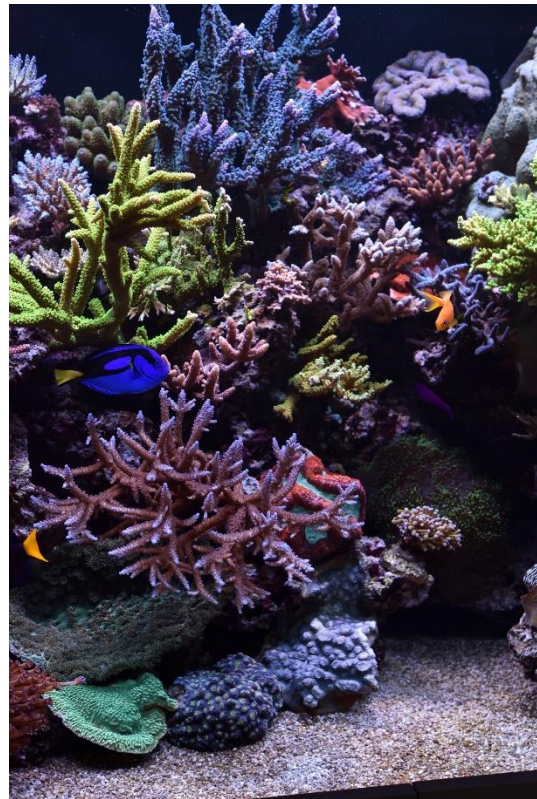
We have performed many experiments (of which some were performed on my private tank) before choosing the final version and at the end of 2019 the design of the Gen2 fixture was fixed. The months after were spent to optimize manufacturability.

In April 2020, the final prototype run was finished which allowed me to switch my existing CoralCare Gen 1.1 lighting to the new CoralCare Gen 2.

25-4-2020 – First images of my tank after switching to CoralCare Gen 2







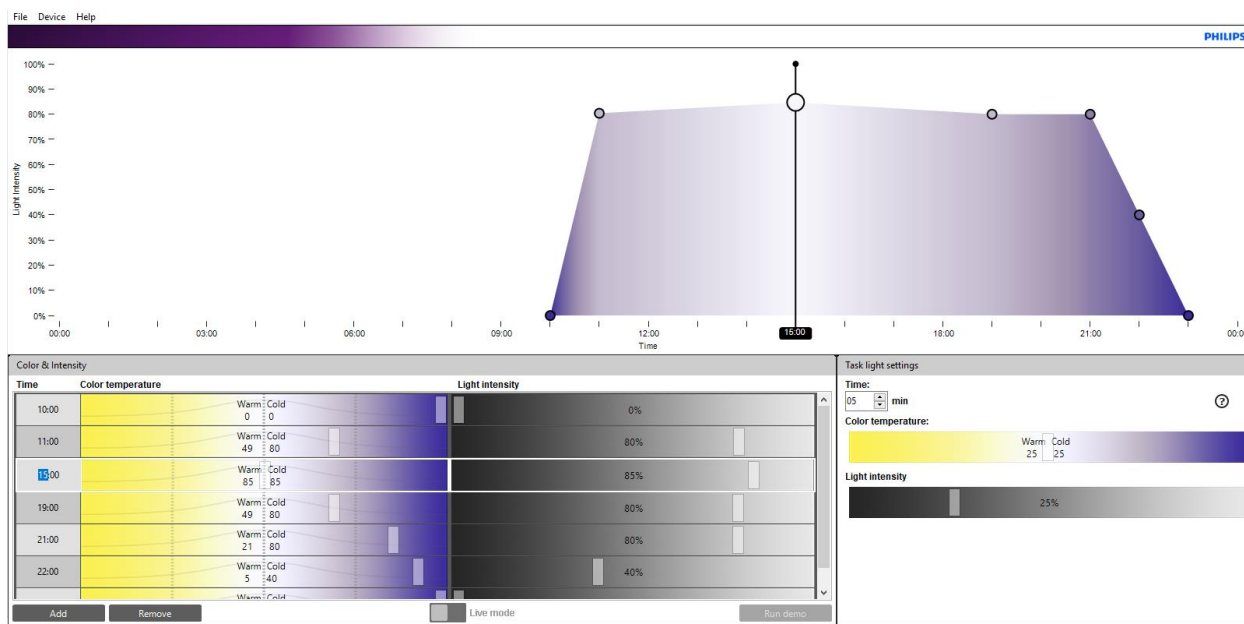
Before changing the fixtures, I measured the PAR values of my existing setup and tried to match this with the new light settings of the Gen2 lighting system to prevent any light shock to the tank.

I have measured 7 locations:

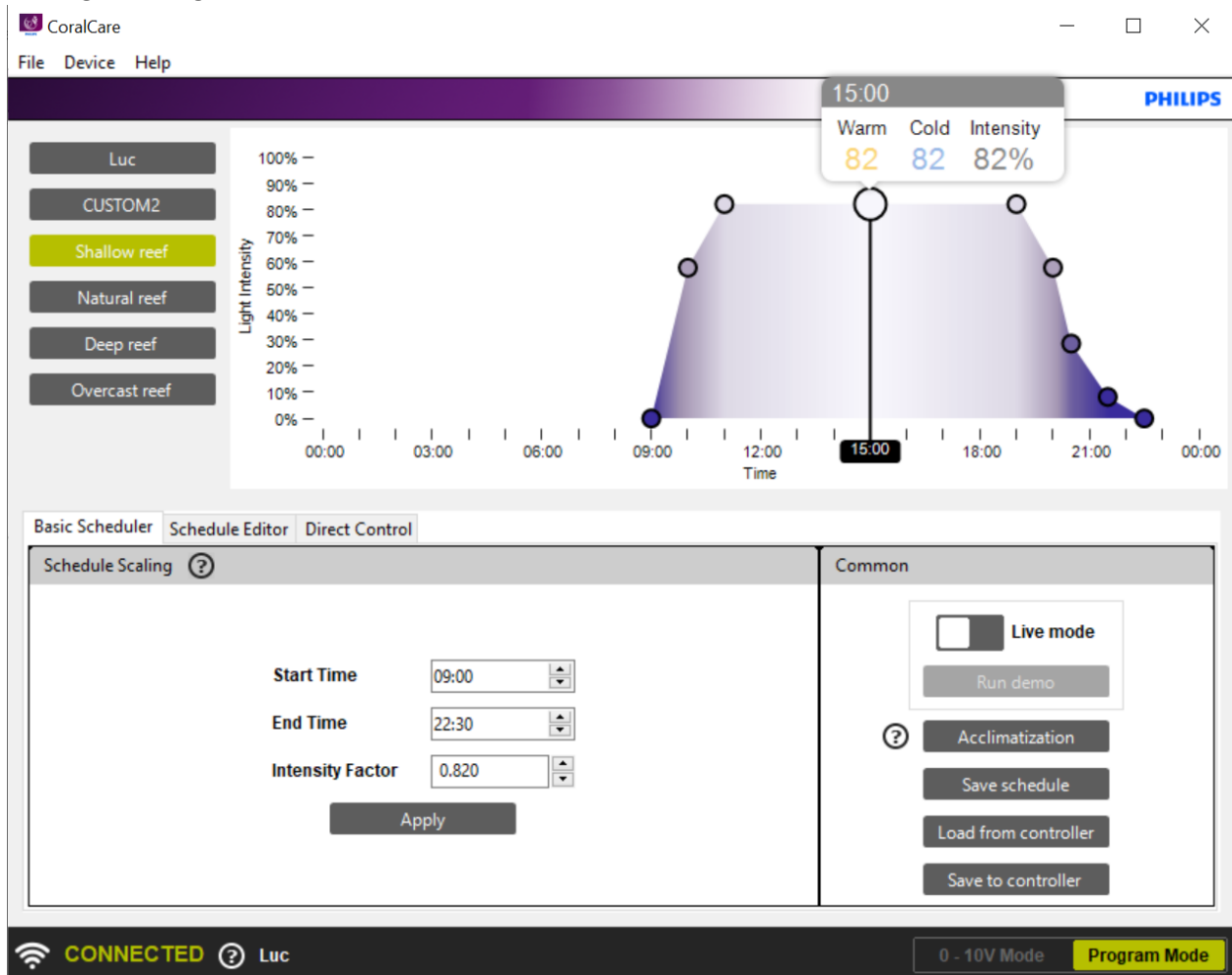
Location	CoralCare V1.1	Tuned CoralCare V2 value
Middle tank, 20 cm from surface	350	400
Acropora Formosa, 30 cm from surface	280	350
Hyacinthus coral, 40cm from surface	250	290
Middle tank, 50 cm from surface	230	215
Bottom left, 75 cm from surface	143	145
Bottom middle, 75 cm from surface	180	183
Bottom right, 75 cm from surface	150	165

Final light settings CoralCare Gen 1.1:

Measurements were performed around 17.00 (referred to below schedule).



New light setting CoralCare Gen2:



The new profile is based on the shallow reef profile which was scaled to an intensity factor of .82.

Images PAR measurement locations

Middle tank, 20 cm from surface



Acropora Formosa, 30 cm from surface



Hyacinthus coral, 40cm from surface



Middle tank, 50 cm from surface



Bottom left, 70cm from surface



Bottom middle, 70cm from surface



Bottom right, 70cm from surface



Distance to water surface

In the old setup with Gen1 fixtures, there was a distance of about 25cm between the water surface and the fixtures.



The new generation enables to install the fixtures closer to the water surface and I decided to install them at 15cm above the water surface.



The final images of my tank with CoralCare Gen 1.1 on them:

20-4-2019 – Twenty-five months after rebuilding the tank - lit with CoralCare Gen1.1



Including the lighting:



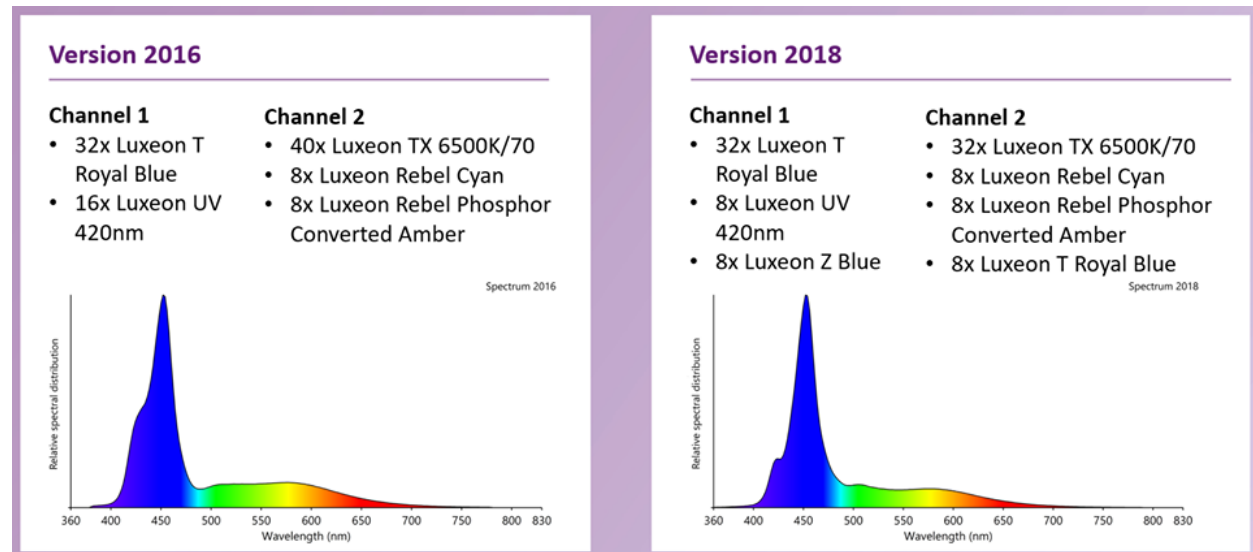
The development and introduction of CoralCare Gen 1.1 (2018)

In 2017 we introduced two new colors for CoralCare (black and white). At the same time, based on market feedback, we decided to update the spectral content and improve the overall light output and efficiency by redesigning the optical plate. These changes were implemented in CoralCare Gen1.1 which was released at Interzoo 2018.

Introduction of new colors



Spectral changes



Light guide changes



In the same year I also decided to renovate my living room, the ideal moment to also empty and rebuild my reef tank. After having rebuilt my aquarium, I replaced the original 2016 CoralCare prototype fixtures with four new CoralCare Gen1.1 fixtures. I also added a new filtration system and a frag tank to my setup reaching a total water volume of about 2000 Liters.

Technical details

- Display tank: 200x70x80
- Filtration tank: 220x60x30
- Frag Tank: 220x70x40
- Flow pumps: 4x Tunze 6105
- Return pump: Jecod DCT 12,000L
- Skimmer : BBK 250 Super marine
- Calcium reactor: DIY
- Control: Neptune Systems Apex

In the below overview you can see the progress of my tank over the past years.

16-11-2019 - Twenty months after rebuilding the tank - lit with CoralCare Gen1.1



24-9-2019 - Eighteen months after rebuilding the tank - lit with CoralCare Gen1.1



10-03-2019 - Thirteen months after rebuilding the tank - lit with CoralCare Gen1.1



22-07-2018 - Five months after rebuilding the tank - lit with CoralCare Gen1.1



13-06-2018 - Four months after rebuilding the tank - lit with CoralCare Gen1.1



14-03-2018 – One month after rebuilding the tank - lit with CoralCare Gen1.1



26-02-2018 – Rebuilt aquarium. This time lit with CoralCare Gen1.1



03-07-2017 – The tank was emptied





The development and introduction of CoralCare Gen 1 (2016)

My name is Luc Vogels and I work as an Electronic engineer in the pre-development department of Philips Lighting. I am responsible for the concept and development of the CoralCare product. I am also a fanatic aquatic hobbyist and bought my first freshwater tank in 2005.

In 2007 I switched from freshwater to my first marine water (nano) tank. In 2013 I switched to my present tank; a mixed-reef of approximately 1100 Liters.

In the below overview you can find some pictures and details of this tank:

Technical details

- Display tank: 200x70x80
- Filtration tank: 120x60x30
- Frag Tank: 100x60x30
- Flow pumps: 4x Tunze 6105
- Return pump: Jecod DCT 12,000L
- Skimmer : BBK 250 Super marine
- Calcium reactor: DIY
- Lighting : 4 Philips CoralCare prototypes

My inspiration to start the CoralCare project was caused by the struggles I had with the conventional lighting technology. The quality of light was very good, but the T5 lighting produced a lot of heat, the bulb replacement was inconvenient and the control very limited. On the other hand, I was not fully convinced that the LED solutions on the market could bring an equal light quality compared to the conventional T5 tubes. Based on these points I pitched an idea to our Philips management which evolved into the CoralCare product in 2016.

After finalizing our first concept studies and lab experiments, I switched from conventional T5 lighting (16x54Watt) to the first Philips LED prototypes in April 2014. These prototypes were slightly different from the current CoralCare fixture in size and power output, but they did have the same spectral content. If you look closely at image 25-4-2014, you can still identify two lighting distribution techniques between the left and right side of the reef. In December 2014 I replaced the prototypes on the left side to match the light distribution on the right side to create a consistent light distribution throughout the reef.

I am very satisfied with the progress and growth results of my reef. The corals grow healthy, have a natural shape and show vivid colors.

The natural appearance and color rendering during daytime settings are very pleasing and I enjoy the fluorescent effect of the corals during the saturated bluish evening setting.

In the below overview you can find some pictures of my aquarium. Note that I trim the corals on regular basis to prevent territorial competition between the corals.

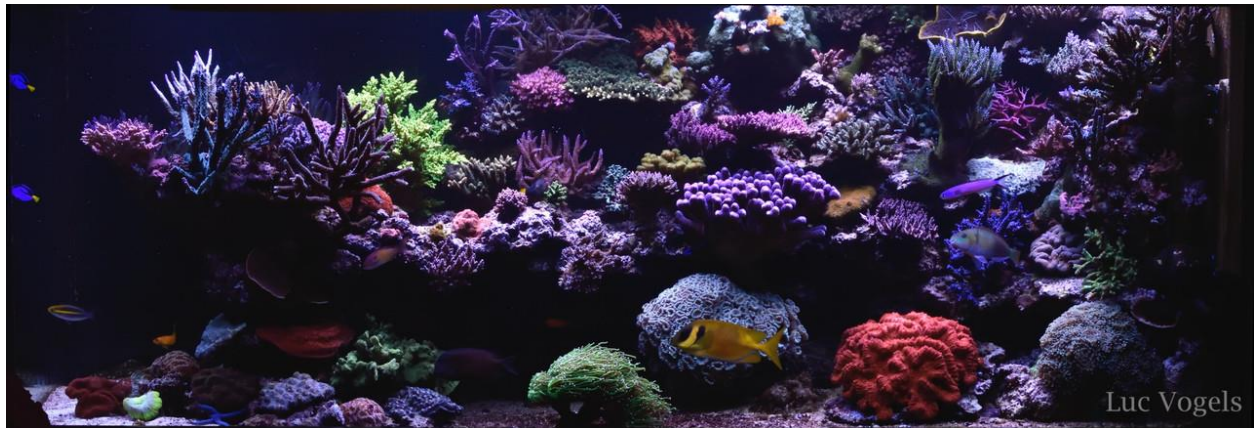
8-1-2017 – Twenty-five months after the installation of the first CoralCare prototypes.



6-11-2016 – Twenty -three months after the installation of the first CoralCare prototypes.



26-8-2016 – Twenty months after the installation of the first CoralCare prototypes. Bluish evening settings of the light.



16-6-2016 –Eighteen months after the installation of the first CoralCare prototypes. Bluish evening settings of the light.



16-4-2016 –Sixteen months after the installation of the first CoralCare prototypes. Right side of the tank is already fading to the evening setting.



1-2-2016 - Fourteen months after the installation of the first CoralCare prototypes.



1-1-2016 - Thirteen months after the installation of the first CoralCare prototypes.



1-12-2015 – Twelve months after the installation of the first CoralCare prototypes.



5-7-2015 – Seven months after the installation of the first CoralCare prototypes.



25-4-2014 – Four months after the installation of the first CoralCare prototypes.



16-7-2013 - The introduction of the first animals in the aquarium



5-7-2013 – Start of the aquarium 30-8-2013 – Tank was lit with 16x54Watt T5 lighting

