Long Time Test T5 Tubes

We were interested how different T5 tubes perform over an extended period of time under real life conditions. There are plenty of measurements floating around, made with different tubes in different fixtures, with different reflectors and under different conditions. To compare all these different tests would be comparing apples and oranges to say the least.

Currently there are many different tubes on the market, among the more popular ones are those from ATI and the AquaScience tubes of Fauna Marin. The Chinese-made tubes are not that popular but much cheaper than those of the German manufacturers.

Whether measurements done with Lux-meters, Quantum-meters, or all those different spectra, every manufacturer wants to show that their tubes are better than those from the competitors. Many aquarists post their experiences on the internet, claiming that their tank looked so much better (or worse) after they changed from one set of tube to another one. Unfortunately those reports can hardly be considered representative, because a change from old tubes to new ones will always cause a change in the tank, because a new tube will always emit more light than an old one.
In order to rule out all these variables we wanted to compare the tubes under absolutely identical conditions:
Same water, same pendant, identical corals, just different tubes.
We wanted to address the following questions:

- How do the corals react on the different light over the course of the experiment?
- How fast do the corals grow?
- How long do the tubes maintain their color spectrum?
- How much does the light output of the tubes drop during the experiment?

Saskia and Christian of the Korallen-Keller-Goldbach were kind enough to provide us with a perfect setup for the experiment. They are professional coral breeders and allowed us to use their large show tank, which is integrated in their large system. All pendants were Fauna Marin Solaris lights.

The tank has the following specs:

Size:	122x31.5x29.5”
Volume of tank	ca. 490 gal
Total volume of system:	1210 gal
Water circulation in tank	ca. 7000 gph
Skimmer	Bubble King, plus Ozone, plus UV

Water parameters	
NO3	2 - 5 ppm
PO4	0.015 – 0.02 ppm
Ca	410 ppm
Mg	1300 ppm
Alk	2.7 meq/L
SiO2	n/d
Additions	Nightsun Trace elements, Kalkreactor with coral gravel and Mg additive

The lights above the tank are two blocks with ten 60” (80W) T5 tubes, so a total of 20 tubes (1600 W total lights) is installed.
On the left side we installed the ATI tubes according to the manufacture’s recommendations in the following order (from front to back)
Spot # 1,2,4,5,7,9.10 : AquaBlue Special
Spot # 3,6,8: Blue Plus

On the right side we installed the AquaScience tubes of Fauna Marin according to the manufacture's recommendations
Spot # 1,2,4,5,7,9.10 : AquaScience Special (15,000 k)
Spot # 3,6,8: AquaScience Blue (22,000 K)

After the tubes were installed we made a measurement with a Lux-meter. We are aware that this is not the correct way to measure the output of a light, but we were just interested in the drop in intensity over time. As expected, the Lux value of the AquaScience tubes was slightly higher than the value of the ATI tubes. This is due to the fact that the ATI tubes are slightly more blueisch.

ATI = 65.500 Lux

AquaScience 70.000 Lux

Especially for the experiment Saskia and Christian made a set of SPS frags of different species. For easier comparison they always made two frags of the same species, with (almost) identical size and shape from the same mother colony.
Each one of the sister frags was placed on either side of the tank, in very similar position with regards to flow and distance from the lights. The tank was in the public viewing area of their shop, so the customers could follow the experiment over the course of 9 months.

Below are pictures of the fragments that we used for the experiment.

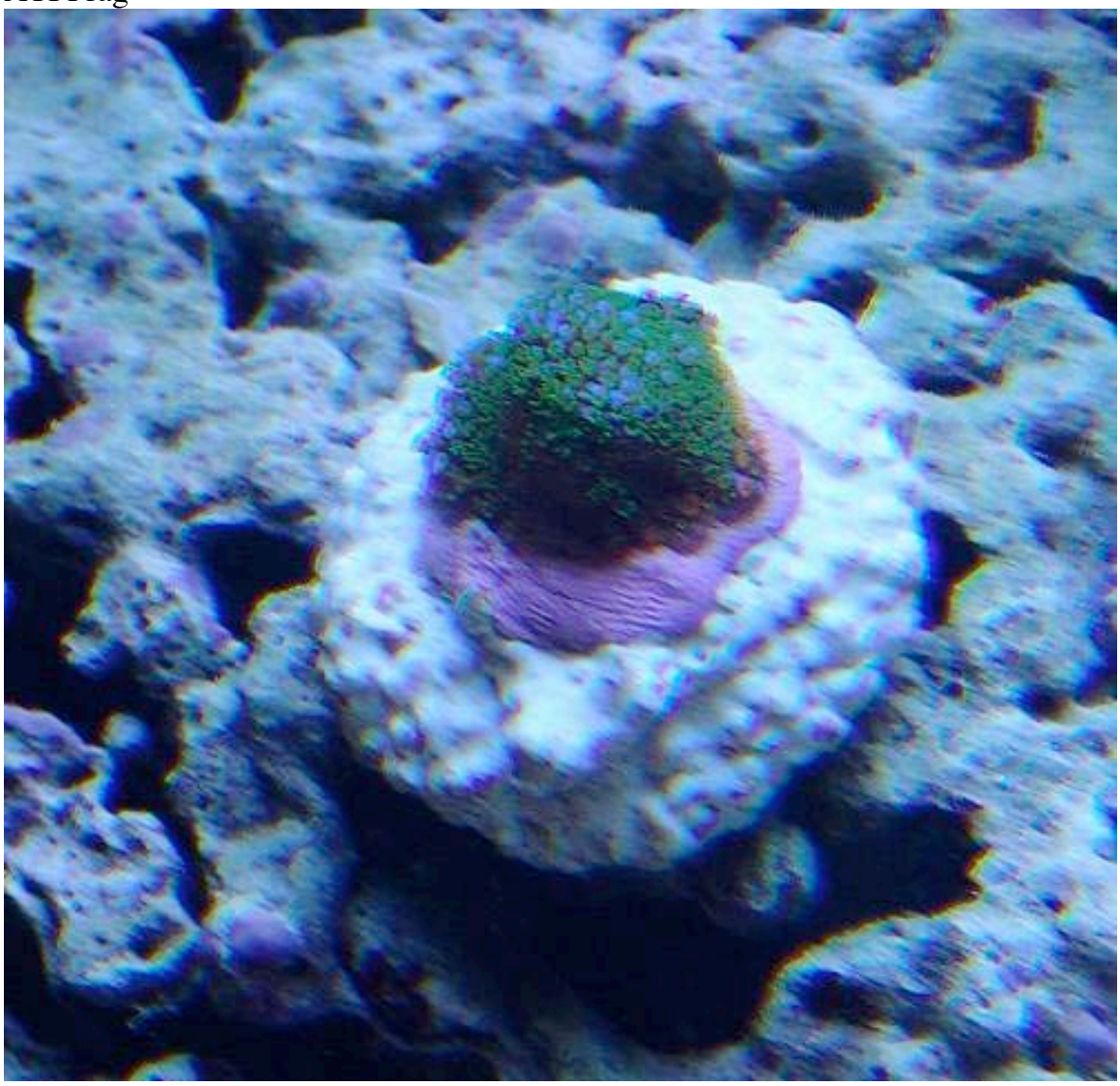
Acropora echinata
ATI Frag

AquaScience Frag

ATI Frag

AquaScience Frag

ATI Frag



AquaScience Frag

ATI Frag

AquaScience Frag

ATI Frag

AquaScience Frag

During the course of the experiment we visited Saskia and Christian several times and took pictures of the corals.

After about 9 months Christian called and told us that he would like to exchange the T5 tubes. The colors of the corals started to fade, the brilliance was almost completely gone. After comparing the look of the corals at the end of the experiment with the pictures we took just a few weeks before, it is safe to say that if color is important, T5 tubes should be exchanged after about 9 months. If color is not such an issue, the tubes can be left in longer.
Now, at the end of the experiment we wanted to see how much the output has decreased. So we brought our Lux-meter and measured again at the very same position. The results was identical for both ATI and AquaScience,: 53.500 Lux, a drop of about 30 % in 9 months.

Although pictures of the corals in the tank look nice, for the end of the experiment we had a better idea. Christian removed the corals from the tank so we could place them side by side.

Comparison 1

On all pictures, the coral on the left was under the Fauna Marin AquaScience, the coral on the right under ATI

Comparison 2
On the left Fauna Marin AquaScience, on the right ATI

Comparison 3
On the left Fauna Marin AquaScience, on the right ATI

Comparison 4
On the left Fauna Marin AquaScience, on the right ATI

As you can see from these comparisons, growth is definitely faster under AquaScience tubes. We also had put a rainbow Montipora in the tank, but these frags had to stay in the tank, they had grown all over the rocks. In the video you can see that also this coral has grown better under AquaScience tubes.

Now we can answer our questions:
How do the corals react on the different light over the course of the experiment?
We think that the corals on both sides looked good and had an attractive coloration. The differences were rather in taste, some people like it more blue than others, that is a matter of personal taste. The A. echinata under AquaScience tubes appeared more lilac, while on the ATI side it looked more blue.

How fast do the corals grow?

There is a distinct difference in growth. Christian estimated that those under AquaScience tubes grew between 10 and 30 % faster, depending on the species. For example, the A. parilis showed only a slight difference between the two frags, but the A. echinata revealed much greater difference.
We can conclude that excessive blue light actually decreases coral growth.

How long do the tubes maintain their color spectrum?

According to our results, we can only recommend to exchange the tubes after 9 months if color is important.

How much does the light output of the tubes drop during the experiment?

Both lights dropped about 30 % over 9 months. The AquaScience tube had a higher output at the beginning, so it dropped slightly more. However, such Lux-meter measurements should not be seen as a definitive answer to this question, it can just give a first impression.

We think that such a test under absolutely identical conditions over a longer period of time will provide more information about the quality of a lighting system than any spectrum.
We hope you enjoyed our little test as much as we did.
In case you are interested in seeing the corals for yourself, as well as all the other beautiful corals, please stop by at Saskia's and Christian's coral farm. You can find them on the internet at
http://www.korallen-keller.de/

Best and salty wishes to all marine Aquarists

Manuela Kruppas and Robert Baur-Kruppas
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