Rigging: From Finding the Right Thread to Spinning a 0.05 mm Rope

By Igor Brekhuntsov

Creating ships in bottles is considered a form of art. And this means that throughout history, masters have sought ways to create not just an imitation of certain model elements, but to find the possibility to get as close as possible to the original, which they are often shrinking hundreds of times. And this opportunity largely came from experimentation, the search for materials, and the development of new techniques and technologies. Looking at photos of some models created 200-300 years ago, or even 50-70 years ago, I am sometimes amazed — how did they manage to create real masterpieces back then...

Nowadays, research and searches in these directions continue. Thanks to progress and the fact that it is much easier for us to communicate with each other, even being in completely different parts of the planet, we have many more opportunities to maintain and further develop the principle of SIB as ART (Ships in Bottles is Art).

In this article, I want to touch upon the topic of the rigging of our models — those very ropes from which we make the standing and running rigging.

Probably, all of us started by simply taking ready-made sewing threads for these purposes. Yes, we wanted to see the result as soon as possible — to look at our model through the glass and think: "Wow! I actually did it!". And the feeling of pride that was born from this was completely legitimate. And we wanted to start building a new model as soon as possible, which is exactly what we did :).

Gradually, skills improved, and models became more complex. At some point, the eye began to stop at the rigging lines, which might have had some fuzziness or simply somehow clashed with the quality of the hull, deck fittings, or spars of the model. The rigging started to seem unconvincing, and we continued the search for those very "ideal" threads in craft stores...

But how do you find that very material that will look like real hemp or steel cable, but at the same time fit into our microscopic scale and not destroy the harmony of the miniature? I want to share my experience in this direction, which might save you from long searches and disappointments.

The Detective in the Stores and the Birth of Technology



My path to improving the rigging of my models began with long and sometimes curious searches. I tried dozens of ready-made threads from various stores. Imagine the faces of the salespeople in craft stores when, in response to their question "What are you going to sew with this?", I replied: "I need to do some rigging on a ship" :).

But this was not exactly what I was looking for. The real breakthrough happened when I realized that I needed not just thin threads of certain diameters, but threads with a specific weaving structure. Right around that time, I purchased an electric ropewalk and almost simultaneously came across fly-tying threads.

I quickly became a regular at fishing stores. And again, the shock of the salespeople: "What kind of flies are you going to tie?" — "I'm going to lay rigging!" 😄

And I started trying to spin three-strand ropes myself. After testing several dozen threads, I identified the most suitable ones for my purposes and got the hang of the spinning process, selecting the appropriate weights and ropewalk settings for different threads and rope diameters.



Range and Expertise

So, using the ropewalk and fly-tying threads, I mastered the three-strand spinning of very small diameter ropes, which are required in our hobby. My working range is from 0.05 mm for the thinnest lines up to 2-3 mm for more "serious" ropes.



You might ask, why such a variety? The thing is, on a real ship, the rigging lines have different diameters depending on their purpose. And if we use different diameters of ropes when making the model's rigging, it adds authenticity to the model. In addition, we build models in different scales, and this also requires a greater variety of rope diameters. And one more point — a working block or deadeye on a model also requires appropriate quality rigging. My ropes, spun from fly-tying threads, turn out to be dense, do not stretch, and — most importantly — maintain perfect geometry along their entire length, which allows, if necessary, doing the threading and adjusting of the rigging already inside the bottle.

Eventually, after testing several dozen threads, I determined the most suitable ones for my purposes. And then I sent a couple dozen samples of my ropes of different diameters and from different threads to Alex Bellinger and Scott Bradner.

I still fondly remember the moment when they examined and measured my ropes (it was about 8 years ago) and highly appreciated their quality. For me, as a novice bottle ship modeler, this was the best reward — confirmation from the authorities that the path I had chosen was correct. And I am grateful to Alex for the work he and Scott did back then and for sending me a table with detailed results of their research. And very recently, Alex gladly gave his permission to publish this table in this article (You can see it at the end of the article)!

Instead of a Conclusion: SIB is Art

In conclusion, I want to say this. Creating ships in bottles is not just a hobby or mechanical assembly. It is, after all, Art...

When we look for the right materials, master new tools, or invent our own technologies, we are not just "improving the model". We are learning to understand the material. We are making a deal with it.

I hope that my experience with finding threads and spinning ropes will help some of you save time or inspire you to conduct your own experiments. Don't be afraid to take a step back, don't be afraid to redo things, and don't be afraid to look for your own "fly-tying threads" in the most unexpected places :).

After all, in the end, we do this not to "conquer" the bottle. We do this to understand it. And when it works out — we take another step on the path to true Art.



Best regards,
Igor Brekhuntsov

P.S. And here is another "cherry on top" or a "bonus" for those who patiently read the article to the end :).

If you do go to a fishing store to look for fly-tying threads, ask for this wire at the same time *(you can add a photo of this wire if you have one)*. It is a very, very fine and soft steel wire that you will most likely find useful as well. You can even spin a thin steel cable out of it using a ropewalk. I also use it from time to time when making small anchors, but I will talk about that another time.

Table of Rope Measurements (Alex Bellinger and Scott Bradner, 2018)

Yarn	# fibers	Color	Strands	Dia. (mm)	Cir. (mm)	Cir. (in)	1:96	1:192
D's 30D	1	white	2 x 1	0,062	0,1948	0,0077	0,74	1,47
HUF 0.04	many	tan	2 x 1	0,090	0,2827	0,0111	1,07	2,14
HUF 0.04	many	tan	3 x 1	0,099	0,3110	0,0122	1,18	2,35
TMC 16/0 W	many	dark	2 x 1	0,065	0,2042	0,0080	0,77	1,54
TMC 16/0 W	many	dark	2 x 2	0,098	0,3079	0,0121	1,16	2,33
TMC 16/0 W	many	dark	3 x 1	0,075	0,2356	0,0093	0,89	1,78
TMC 16/0 W	many	tan	2 x 1	0,072	0,2262	0,0089	0,85	1,71
TMC 16/0 W	many	tan	2 x 2	0,096	0,3016	0,0119	1,14	2,28
TMC 16/0 W	many	tan	3 x 1	0,077	0,2419	0,0095	0,91	1,83
UNI-C 20D	1	dark	2 x 1	0,051	0,1602	0,0063	0,61	1,21
UNI-C 20D	1	dark	2 x 2	0,083	0,2608	0,0103	0,99	1,97
UNI-C 20D	1	dark	3 x 1	0,089	0,2796	0,0110	1,06	2,11
UNI-C 20D	1	dark	3 x 2	0,096	0,3016	0,0119	1,14	2,28

Yarn	# fibers	Color	Strands	Dia. (mm)	Cir. (mm)	Cir. (in)	1:96	1:192
UNI-C 20D	1	white	3 x 1	0,048	0,1508	0,0059	0,57	1,14
UNI-C 20D	1	White	3 x 2	0,086	0,2702	0,0106	1,02	2,04
UNI-C 20D	1	White (Tan)	3 x 1	0,050	0,1571	0,0062	0,59	1,19
UNI-T 8/0 W	many	dark tan	2 x 1	0,094	0,2953	0,0116	1,12	2,23
UNI-T 8/0 W	many	dark tan	2 x 2	0,143	0,4492	0,0177	1,70	3,40
UNI-T 8/0 W	many	dark tan	3 x 1	0,110	0,3456	0,0136	1,31	2,61
UNI-T 8/0 W	many	dark tan	3 x 2	0,172	0,5404	0,0213	2,04	4,08
UNI-T 8/0 W	many	dark	2 x 1	0,096	0,3016	0,0119	1,14	2,28
UNI-T 8/0 W	many	dark	2 x 2	0,146	0,4587	0,0181	1,73	3,47
UNI-T 8/0 W	many	dark	3 x 1	0,109	0,3424	0,0135	1,29	2,59
UNI-T 8/0 W	many	dark	3 x 2	0,164	0,5152	0,0203	1,95	3,89

*Note: In the "Strands" column, the number of strands and threads in each strand is indicated. For example, **2x1** means two strands, each consisting of 1 thread; **3x2** — three strands, each twisted from 2 threads.*

I hope this information will be useful to some of my colleagues.