UPSILON

WORKBOOK

Telescoping Design Guide

Six steps from an idea to a telescoping product ready for production.



Custom telescoping tube and pole manufacturer, founded in Taiwan in 1985
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HOW TO USE THIS WORKBOOK

Six decisions, in order

Upsilon's Telescoping Design Guide is a design handbook for brands. It walks through the six decisions that define a telescoping product, in the order they affect each other: the use case drives the length, the length drives the material and lock, and the retail box can limit the collapsed length.

Each step explains the choice, then leaves space for your answers. You can type straight into the boxes. The last page is a project brief: fill it in and send it to us, or to any factory you are talking to. Leave anything you are unsure of blank; we complete it together in the engineering review, which is free.

1	**Use case**	Who uses it, where, and how
2	**Length and sections**	Extended and collapsed length
3	**Material**	Stainless, aluminum, brass or carbon fiber
4	**Lock**	Five lock types and pull-out protection
5	**Force and load**	How it feels and what it carries
6	**Appearance and packaging**	Finish, color, logo and format

What we make

Upsilon makes mechanical telescoping tubes and poles: spring clips and locks, in stainless steel, aluminum, brass and carbon fiber. Hydraulic and pneumatic telescoping are not supported.

STEP 1

Use case: who, where and how

The use case drives every choice that follows. For a pole used by the sea, corrosion resistance comes first; for a tool extended every day, lock life comes first; for retail, the package size limits the collapsed length.

Answer these five questions first

Who uses it: professionals or everyday consumers?

Where: indoors, outdoors, by the sea, or in water?

How often: occasionally, or extended every day?

One hand or two?

Where is it stored: a toolbox, golf bag, car trunk or retail shelf?

Anything else about how it is used

STEP 2

Length and sections

Start with two numbers: the full extended length and the shortest collapsed length. Collapsed length roughly sets each section's length; extended length sets how many sections.





Section length is set by the collapsed length;
section count is set by the extended length plus overlaps.

Because sections overlap, the real section count is a little higher than extended length ÷ collapsed length. More sections pack smaller but reduce stiffness, so first check whether the collapsed length really must be that short.

Choose the largest section and the section count, and we build the set from neighboring stock sizes. There are 100+ stock diameters in stainless steel, aluminum and brass, plus 4 carbon fiber stock series; choosing them avoids tooling.

Material	Diameter range	Section length
Aluminum	Ø7–52 mm (75 stock)	100–2,000 mm
Stainless steel	Ø2.8–23 mm (25 stock, shared with brass)	40–400 mm
Brass	Ø2.8–23 mm	40–400 mm
Carbon fiber	Stock Ø7.1–31.5 mm, custom available	Same range as other materials

Extended length mm or inches

Collapsed length mm or inches

Estimated section count

Largest (outer) diameter, if known

STEP 3

Material

Each of the four materials has its strengths. First decide which matters most for the use, weight, strength, corrosion resistance or appearance, then check the diameter range.

Material	Strengths	Diameter and specs	Best for
Aluminum	Light, anodizes in many colors	Ø7–52 mm; 75 stock; wall 0.5–2.0 mm	Light, colorful, frequently extended products
Stainless steel	Strong, corrosion-resistant; precision-drawn wall ±0.05 mm	Ø2.8–23 mm; 201 / 304 / 316 / 316L; 316/316L for marine use	Load-bearing, outdoor, coastal; 304 for food contact
Brass	Rich metallic look; chrome, nickel or polished	Ø2.8–23 mm; H65; shares stainless stock sizes	Visible parts, conductive parts, premium gifts
Carbon fiber	Lightest and stiff at the same length	Full carbon, hybrid or fiberglass; mostly custom plus 4 stock series; MOQ 1,000 pcs per SKU	Extra-long and light poles, premium lines

Good to know

All four materials conduct electricity, carbon fiber included. For products used near power lines, tell us before development.

Rule of thumb for stainless: water and salt, 316; food, 304; no special need, 201.

Preferred material or leave blank

Target weight or "as light as possible"

Environment: indoor, outdoor, coastal, food contact?

STEP 4

Lock

Choose a lock by two things: how often the length changes, and which way the force comes. All five lock types are available, and every unit has pull-out protection.

Lock	How it works	Best for
Flip lock	Open to adjust, close to lock: the fastest	Frequent adjustment, outdoors, gloved hands
Twist lock	Twist the tube to lock: a clean look	High appearance standards, occasional adjustment
External twist lock	Turn the outer collar to lock: strong holding force	Stronger locking, poles that are turned or pushed hard
Push-button lock	Press the button to move between fixed positions	A few fixed lengths that stay put in use
Friction-fit	Phosphor bronze clips hold by friction, stopping anywhere	Light loads, quick adjustment

Pull-out protection

Not a lock but a safety baseline: rolled grooves, dimples or crimped edges stop sections firmly at full extension, and tube ends stay smooth when collapsed. Carbon fiber pairs with friction-fit, flip locks and twist locks.

Preferred lock or describe how it is used

How often is the length adjusted?

Will users wear gloves, or turn the pole while using it?

STEP 5

Force and load

Telescoping force is the force to extend and collapse, which decides how it feels in the hand. It is customizable from about 500 to 3,000 g for the whole pole (aluminum from about 800 g), and each extra section adds about 200–300 g. No numbers needed: describe the feel and we tune it at the sample stage.

Load depends on the direction of force:

Direction of force	What it measures	Approximately
Pulled outward along the shaft	The pull it withstands when locked	About 20–30 kg
Pressed down along the shaft	The weight the lock holds firmly when locked	About 20–80 kg
Weight hung from a horizontal pole	Depends directly on extended length	Tested per project

Numbers vary with material, diameter and lock. Our telescoping cycle test runs about 7 cycles per minute, up to about 100,000 cycles.

Feel: a light one-hand pull, or firmer so it stays put overhead?

Load direction: pulled, pressed or hanging?

Roughly how heavy?

STEP 6

Appearance, branding and packaging

Finishes. Nine in all: anodizing, plating, high-gloss polishing, e-coating, baked paint, powder coating, brushing, sandblasting and natural carbon weave. Brass takes chrome, nickel or polish.

Color. Anodized aluminum has three stock colors, natural (silver), black and gold, which go straight to production. Other colors are matched as closely as possible to your Pantone code and confirmed on the pre-production sample. For an exact brand color, choose baked paint or powder coating.

Logo. Laser marking, hot stamping, screen printing, UV printing or transfer; position and color are confirmed on the pre-production sample.

How far we take it.

Format	What arrives	MOQ	Lead time
Bare Telescoping Tubing	The tube itself, lock and force set	None	15–20 days
Semi-Finished	Plus grip, end cap and connectors	3,000 pcs/SKU	30–45 days
Finished	Plus the function head, ready to use	3,000 pcs/SKU	30–45 days
Retail-Ready	Plus individual retail packaging	3,000 pcs/SKU	30–45 days

Lead times run from order confirmation, excluding international freight. New tooling adds 30–45 days.

Color (Pantone code)

Logo process and position

Format — Bare, Semi-Finished, Finished or Retail-Ready

Packaging and sales channel

BEFORE YOU SEND IT

The six design mistakes we see most

1 Force and load left unclear

Without a clear force requirement we can only use a standard setting, which may not match real use; some products take heavy loads that were never stated up front.

2 Extended length given, collapsed length missing

Collapsed length sets section length and package size, so both numbers are needed. Most important, tell us the use.

3 Too many sections

More sections pack smaller but reduce stiffness and load. Check whether the collapsed length really must be that short.

4 Expecting an exact anodized color match

Anodizing gets as close as possible to a Pantone code, with the pre-production sample as the reference. Natural, black and gold are fastest.

5 Carbon fiber with an over-tight lock

Carbon fiber is very strong along the shaft; the lock type and clamping force are designed together, which is why carbon pairs with friction-fit, flip and twist locks.

6 Packaging left until last

For retail products, the box and hang card size limit the collapsed length, so set them early in development.

PROJECT BRIEF

Send this page to us

Fill in what you know; leave the rest blank. Email it to **dora.l@upsiloncx.com** or send it on WhatsApp (+86 183 5023 6815). We reply within 6–10 hours and send a solution and quote within 24–48 working hours.

Your name

Company

Email

Phone / WhatsApp

Product name

Target market and sales channel

Use case: who uses it, where and how

Extended length

Collapsed length

Preferred material

Preferred lock

Load or feel requirements

Format

Color (Pantone) and logo

Estimated quantity

Notes, drawings or references you will attach

Upsilon can sign an NDA before you send drawings. Your design is used only for your project.