THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM

Safety Wire Sizes & Methods Chart

Double-twist safety wire is 0.032 in minimum on holes over 0.045 in, with 6 to 8 twists per inch.

1 Identification

Wire size by use

Use	Wire	Source
Double-twist, part with a hole **larger than 0.045 in**	**0.032 in minimum**	AC 43.13-1B 7-123b. Handbook p. 2-55: most common is stainless or Monel, 0.032–0.040 in.
Double-twist, hole **0.045 to 0.062 in**, parts less than 2 in apart	**0.020 in**, double strand	AC 7-123b
Single-wire method	The **largest wire the hole will accept**	AC 7-123b
Hole of 0.045 in or less	No size given	Not in AC 7-123 or the Handbook
Emergency mechanisms that must shear (switch guards, exit handle covers, fire extinguishers, emergency gear releases)	**Copper or brass, 0.020 in only**	AC 7-123. No stainless, Monel, carbon steel or aluminum alloy wire here.
Seals on first-aid kits, portable fire extinguishers, emergency valves, oxygen regulators	Copper **0.020 in** or aluminum **0.031 in**, or as the technical order says	AC 7-123b. Handbook p. 2-55: the seal must break by hand without tools.

The two methods

Method	Where it is used	Examples in AC Figure 7-3
Double-twist	The most common method. Studs, cable turnbuckles, flight controls, engine accessory bolts (Handbook p. 2-55). Two wires twisted together between the parts.	Single fastener; screw heads; bolt heads; castle nuts
Single-wire	Screws, bolts or nuts in a closely spaced or closed geometric pattern: a triangle, square, rectangle or circle. Also parts in electrical systems and places that are hard to reach.	Small screws in a closed pattern; external snapring

Twists between the parts

Distance between parts	Twists at 6–8 per inch
1/2 in	3–4
1 in	6–8
1½ in	9–12
2 in	12–16
3 in	18–24
4 in	24–32

Educational reference only, not approved data. Always consult the applicable SRM, AMM, or AC 43.13-1B and your certifying authority.

THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT

Turnbuckle safety wire (AC 43.13-1B Table 7-8)

Cable size	Wrap	Wire diameter	Wire material, annealed
1/16	Single	0.040 in	Copper, brass [1]
3/32	Single	0.040 in	Copper, brass [1]
1/8	Single	0.040 in	Stainless steel, Monel, "K" Monel
1/8	Double	0.040 in	Copper, brass [1]
1/8	Single	0.057 in min.	Copper, brass [1]
5/32 and greater	Double	0.040 in	Stainless steel, Monel, "K" Monel [1]
5/32 and greater	Single	0.057 in min.	Stainless steel, Monel, "K" Monel [1]
5/32 and greater	Double	0.0512 in	Copper, brass

Wire materials named in the sources

Material	Where the sources use it	Where it is excluded
Soft brass or steel wire	Cylinder studs, control cable turnbuckles, engine accessory attaching bolts (AC 7-122a)	Not stated
Turnbuckle lock wire	Carbon steel, corrosion-resistant steel, Inconel, Monel or aluminum alloy (AC 7-182a); Table 7-8 lists copper, brass, stainless, Monel and "K" Monel	Table 7-8 has no aluminum row although 7-182a names aluminum alloy; follow the table for size
Stainless steel or Monel, 0.032–0.040 in	The usual double-twist wire (Handbook p. 2-55)	**Not on emergency mechanisms** (AC 7-123)
Carbon steel	Named only in the exclusion	**Not on emergency mechanisms** (AC 7-123)
Copper, 0.020 in	Seals, and emergency devices that need shear wire (AC 7-123, 7-123c)	—
Brass, 0.020 in	Emergency devices that need shear wire (AC 7-123)	—
Aluminum, 0.031 in	Seals only (AC 7-123b; Handbook p. 2-55)	**Not on emergency mechanisms.** "Care should be taken not to confuse steel with aluminum wire."

Where the sources agree, and where they do not

Point	First source	Second source	Where they differ, and what governs
Hole over 0.045 in	AC 43.13-1B par. 7-123b: double-twist, 0.032 in minimum wire	MS20995: the dash is the diameter, MS20995C20 = 0.020 in and MS20995C32 = 0.032 in	Agree on 0.032 in. Handbook p. 2-55 calls stainless or Monel 0.032 to 0.040 in usual: the larger wire is allowed where the hole takes it.
Hole 0.045 to 0.062 in	AC 43.13-1B par. 7-123b: 0.020 in double strand where parts are less than 2 in apart	MS20995C20: 0.020 in wire	Agree. The AC sets the use, the standard the wire.
Pigtail	AC 43.13-1B par. 7-124: after the loop, at least four to six complete turns, about 1/2 to 5/8 in	Handbook p. 2-55: the method and the twist rate	Agree.
Which governs	AC 43.13-1B and the Handbook: general practice	NASM33540, Safety wiring, safety cabling, cotter pinning, general practices	Where the maintenance data names NASM33540 for the installation, its figures govern.

2 Allowable damage

—

3 Repair

—

Key points

- **The aircraft's manual governs**, including wire material, size and the number of parts that may be wired in series.
- **Emergency equipment has its own wire.** Copper or brass 0.020 in only, so that it shears. Do not use stainless, Monel, carbon steel or aluminum alloy wire there.
- **No size is given for holes of 0.045 in or less.** Use the manufacturer's data.
- **Cotter pins and self-locking nuts** are separate means of safetying with their own rules (AC 7-122, 7-127).
- **Turnbuckle wrapping** is only summarized here (size table and turn counts). The step-by-step wrap is in AC 43.13-1B 7-180 to 7-182 and Figures 7-26 and 7-27.

MAIN SOURCES · FAA AC 43.13-1B CHG 1, Chapter 7, par. 7-38, 7-122 to 7-126, 7-181, 7-182, Figures 7-3 and 7-3a, Table 7-8 · FAA-H-8083-31, AMT Handbook — Airframe, Volume 1, Chapter 2, pp. 2-45, 2-54 and 2-55, Figures 2-91 to 2-93 · FAA AC 43.13-1B CHG 1, Acceptable Methods, Techniques, and Practices: Aircraft Inspection and Repair · MS20995, Wire, Safety or Lock · NASM33540, Safety Wiring, Safety Cabling, Cotter Pinning, General Practices

SCAN · OPEN THIS GUIDE
theaviationpoint.com/standard-practices/safety-wire-sizes/

Educational reference only, not approved data. Always consult the applicable SRM, AMM, or AC 43.13-1B and your certifying authority.