

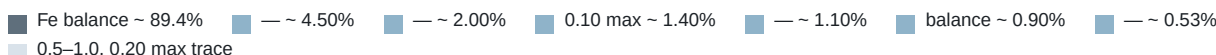
ASTM F467 Nonferrous Nuts — Material Data Sheet

ASTM F467 · ASME B18.2.2 · UNS C46400, C65100, C63000, N04400, N05500, N06625 and others · Copper, nickel, aluminium and titanium alloys
Nonferrous hex, heavy hex, jam and flange nuts for general use

The companion of F468: nuts in the same brass, bronze, copper-nickel, Monel, Inconel, Hastelloy, aluminium and titanium alloys, each with a proof stress for hex and heavy hex styles and a minimum hardness.

SILICON BRONZE 651, HEX	70 ksi proof · 75 HRB min	MONEL K-500, HEX	130 ksi proof · 24 HRC min
NAVAL BRASS 464, HEX	50 ksi proof · 55 HRB min	INCONEL 625 GRADE 2, HEX	120 ksi proof
MONEL 400, HEX	80 ksi proof · 75 HRB min	HEAVY HEX NUTS	1.08 × the hex proof stress

Nominal composition



Midpoints of the specification ranges, for orientation only. Limits are in the table.

Chemical composition — ASTM F467 alloys (same as F468)

Element	464 naval brass	651 silicon bronze	630 Ni- Al bronze	400 Monel	500 Monel K-500	625 Inconel
Copper	59.0– 62.0	balance	balance	balance	balance	—
Nickel	—	—	4.0–5.5	63.0– 70.0	63.0– 70.0	balance
Zinc	balance	1.5 max	0.30 max	—	—	—
Tin	0.5–1.0	—	0.20 max	—	—	—
Silicon	—	0.8–2.0	0.25 max	0.5 max	0.5 max	0.50 max
Aluminium	—	—	9.0–11.0	—	2.30– 3.15	0.40 max
Iron	0.10 max	0.80 max	2.00– 4.00	2.5 max	2.0 max	5.0 max
Manganese	—	0.70 max	1.50 max	2.0 max	1.5 max	0.50 max
Chromium	—	—	—	—	—	20.0– 23.0
Molybdenum	—	—	—	—	—	8.0–10.0
Niobium	—	—	—	—	—	3.15– 4.15
Titanium	—	—	—	—	0.35– 0.85	0.40 max
Lead	0.20 max	0.05 max	—	—	—	—
Carbon	—	—	—	0.3 max	0.25 max	0.10 max

Compositions are those of ASTM F468 Table 1 for the same alloy numbers; Values per ASTM F467-24 Table 1 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Physical properties (typical)

DENSITY	Varies by alloy: 0.098 (aluminium) to 0.32 lb/in ³ (nickel-copper)
MODULUS OF ELASTICITY	10 (aluminium) to 30 × 10 ⁶ psi (nickel alloys)
MAGNETIC	No (all listed alloys)
GALVANIC NOTE	Match the fastener alloy to the joint material to avoid galvanic attack

Heat treatment

As for the F468 bolt alloys: copper alloys as drawn, Monel K-500 aged, nickel alloys annealed, aluminium and titanium in the listed tempers. Nuts are tested in full section by proof load up to 120 ksi proof stress; above that, and for jam, slotted and castle nuts, hardness is the mandatory test.

Proof stress and hardness — ASTM F467 nonferrous nuts (selected alloys)

Alloy · marking	Proof stress, hex and hex flange (ksi)	Proof stress, heavy hex and thick (ksi)	Hardness, min	—	—
Cu 110 ETP copper · F467A	30	32	65 HRF		
Cu 260 / 270 brass · F467AB / F467B	60	65	55 HRF		
Cu 464 naval brass · F467D	50	54	55 HRB		
Cu 510 phosphor bronze · F467E	60	65	60 HRB		
Cu 614 aluminium bronze · F467G	75	81	70 HRB		
Cu 630 Ni-Al bronze · F467H	100	108	85 HRB		
Cu 642 Al-Si bronze · F467J	75	81	75 HRB		
Cu 651 silicon bronze · F467K	70	76	75 HRB		
Cu 655 silicon bronze · F467L	50	54	60 HRB		
Cu 675 manganese bronze · F467N	55	59	60 HRB		
Cu 715 copper-nickel 30 % · F467R	55	59	60 HRB		
Ni 400 Monel · F467U	80	86	75 HRB		
Ni 405 Monel R-405 · F467V	70	76	60 HRB		
Ni 500 Monel K-500 · F467W	130	140	24 HRC		
Ni 625 Grade 1 · F467AC	60	65	85 HRB		
Ni 625 Grade 2 · F467AD	120	130	85 HRB		
Ni 276 Hastelloy C-276 · F467T	110	119	20 HRC		
Ni 686 Grade 1 · F467BN	120	130	21 HRC		
Al 6061-T6 · F467Y	40	43	40 HRB		
Al 2024-T4 · F467X (not recommended over ¼ in.)	55	59	70 HRB		
Ti 2 · F467BT	55	59	150 HV		
Ti 5 · F467DT	135	146	30 HRC		

Values per ASTM F467-24 Table 2 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team. Heavy hex, large hex flange and thick nuts are 1.08 times the hex value.

Applicable standards

ASTM F467	Nonferrous nuts for general use
ASTM F468	Matching nonferrous bolts, cap screws and studs
ASME B18.2.2	Nut dimensions
ASTM F606	Proof load and hardness test methods

Forms we supply in F467 nonferrous nuts

- Hex, heavy hex and jam nuts
- Hex flange and thick nuts
- Slotted and castle nuts
- Machined specials to drawing

Typical applications

- Nuts for F468 bronze, brass, Monel and Inconel bolts
- Marine, dock and shipboard hardware
- Water and wastewater plant
- Seawater and chemical process equipment
- Non-magnetic and spark-resistant assemblies