DIN 934

HEXAGON NUT

Complete Technical Specifications & Application Guide

ScrewTool®
Fastener & Fixing

shscrewtool.com

Industrial Fastener Platform

Fastener Weight Calculator • BOM Optimization • Technical Whitepapers

1. Product Overview

Product Description

DIN 934 hexagon nuts are the world’s most widely specified nut standard. Paired with DIN 931 or DIN 933 bolts, they form the ubiquitous nut-and-bolt joint found in products ranging from washing machines to electric vehicles to semiconductor equipment. Sizes range from M1.6 to M64, with property classes 6, 8, 10, and 12 matching the full spectrum of bolt strength grades. Key parameters include width across flats (s), nut height (m), and across-corner dimension (e).

Commercial Description

Shanghai Screwtool stocks DIN 934 nuts in carbon steel (Class 6 through 12), stainless steel A2-70 and A4-80, brass, and aluminum. Surface treatments include zinc, HDG, Dacromet, Geomet, and Zn-Ni for EV battery applications (1000+ hours NSS). Prevailing torque variants (DIN 985 nylon insert, DIN 980V all-metal) available. Full PPAP Level 3 for automotive programs; IMDS submission support. Standard sizes in continuous stock; custom and non-standard configurations on request. Contact info@shscrewtool.com.

Equivalent Standards

ISO 4032, GB/T 6170, JIS B 1181. Dimensions broadly interchangeable across standards, but chamfer geometry and thread class differences may affect automated assembly performance. The nut property class must match the bolt: Class 8 nut with 8.8 bolt, Class 10 with 10.9, etc. Underspecifying the nut class relative to the bolt leads to thread stripping failure.

Equivalent Standards

ISO 4032, GB/T 6170, JIS B 1181

Key Features

- Standard hexagon profile compatible with all metric wrenches
- Chamfered on both bearing faces for easy automated feeding
- Available: M1.6 to M64 diameter range
- Property classes: 6, 8, 10, 12 (matching bolt grades 4.6 12.9)
- Product grade A (M1.6 M16) and B (M16+)
- Widely available in carbon steel, stainless, brass, and aluminum

2. Target Market Applications

Home Appliance Assembly

Cost-efficient, RoHS compliant, aesthetic finish, high-volume automation

Hex nuts paired with bolts form the backbone of appliance structural assembly. Automated nut-runners drive millions per day in high-volume production lines.

Application Example	Technical Rationale
Washing machine suspension spring anchor nuts	Class 10 nut + 8.8 bolt withstands shock loads during spin cycle imbalance
Dryer drum roller axle retention	Prevailing torque nut (DIN 985 variant) prevents loosening from drum rotation vibration
Dishwasher pump motor mounting	SS A2 nut + bolt for wet environment; avoids zinc corrosion contamination
Range oven door hinge pivot	Thin pattern nut (DIN 439 variant) for tight hinge clearance

Electric Vehicle

Lightweight materials, Zn-Ni plating 1000h+, ISO/TS 16949, thermal stability

EV powertrain and battery systems demand nuts with precise proof-load characteristics, controlled thread friction, and high-temperature stability.

Application Example	Technical Rationale
Traction motor through-bolt retention	Class 12 flange nut + 12.9 bolt for maximum clamp load in compact motor envelope
Battery module compression plate nuts	Precise torque-tension control essential for cell compression (3 5 kN per cell stack)
HVJB (High-Voltage Junction Box) bushing nuts	Flange nut with captured O-ring for IP67 sealing around high-voltage feed-through
Subframe to body mount nuts	Class 10 self-locking nut with nylon insert for road vibration survival

Semiconductor

Cleanroom Class 100, low outgassing, vacuum compatible, precision torque

For semiconductor equipment, nuts are specified from miniature (M1.6 M3) cleanroom versions to large structural nuts for facility infrastructure.

Application Example	Technical Rationale
Gas panel VCR gland nuts	Silver-plated 316L nut for anti-galling + corrosive gas compatibility at 10 mbar L/s leakage rate
Ion implanter source housing nuts	Molybdenum nut for high-temperature (300 C+) vacuum resistance + low thermal expansion
Wafer aligner precision lead screw nuts	Bronze nut with PTFE insert for zero-backlash linear motion < 0.5 m resolution
Facility gas cabinet cylinder restraint nuts	HDG class 8 nut for structural integrity under seismic + gas cylinder handling loads

3. Material & Property Classes

The correct material-grade selection determines joint performance, corrosion resistance, and total cost of ownership. Each grade is optimized for specific market requirements.

Material	Grade	Tensile Strength	Target Market Recommendation
Carbon Steel	Class 6, 8	600 800 MPa	(general), (facility)
Carbon Steel	Class 10, 12	1000 1200 MPa	EV (powertrain, chassis)
Stainless A2 (304)	A2-70	700 MPa	(wet), (cleanroom)
Stainless A4 (316)	A4-80	800 MPa	EV (battery), (process gas)

Material Density Reference

Material	Density (g/cm)	Typical Application
Carbon Steel	7.85	General industrial, structural assemblies
Stainless A2 (304)	7.93	Indoor corrosion resistance, food grade, cleanroom
Stainless A4 (316)	8.00	Marine, chemical processing, EV battery enclosure
Brass CuZn37	8.50	Non-magnetic, electrical connectivity, decorative
Aluminum 7075	2.81	Lightweight, aerospace, EV sensor mounting brackets
Nylon PA66	1.14	Electrical insulation, low-friction bearing surfaces
Titanium Ti-6Al-4V	4.43	High strength-to-weight, medical devices, racing

4. Theoretical Weight Table

Values in kg per 1,000 pieces Carbon Steel (density 7.85 g/cm). For other materials, multiply by conversion coefficient: Stainless 1.01 | Brass 1.08 | Aluminum 0.36 | Nylon PA66 0.15.

Size	M4	M5	M6	M8	M10	M12	M16	M20	M24
kg/1000pcs	0.54	0.85	1.48	3.65	6.80	9.80	19.50	34.00	54.50

Quick Conversion: Find weight in table, multiply by material coefficient. Example: M8 40 in 316 SS weight = 18.2 1.01 = 18.4 kg/1000 pcs. Visit shscrewtool.com/fastener-weight-calculator for instant multi-material calculations.

5. Dimensional Specifications

All dimensions in mm. Refer to DIN/ISO standard for full tolerance ranges.

d (mm)	Pitch	s (wrench)	e min	m (height)	m min
M3	0.50	5.5	6.01	2.4	2.15
M4	0.70	7.0	7.66	3.2	2.9
M5	0.80	8.0	8.79	4.7	4.4
M6	1.00	10.0	11.05	5.2	4.9
M8	1.25	13.0	14.38	6.8	6.44
M10	1.50	17.0	18.90	8.4	8.04
M12	1.75	19.0	21.10	10.8	10.37
M14	2.00	22.0	24.49	12.8	12.1
M16	2.00	24.0	26.75	14.8	14.1
M18	2.50	27.0	30.14	15.8	15.1
M20	2.50	30.0	33.53	18.0	16.9
M22	2.50	32.0	35.72	19.4	18.1
M24	3.00	36.0	39.98	21.5	20.2
M27	3.00	41.0	45.2	23.8	22.5
M30	3.50	46.0	50.85	25.6	24.3
M33	3.50	50.0	55.37	28.7	27.4
M36	4.00	55.0	60.79	31.0	29.4
M39	4.00	60.0	66.44	33.4	31.8
M42	4.50	65.0	71.3	34.0	32.4
M45	4.50	70.0	76.95	36.0	34.4
M48	5.00	75.0	82.6	38.0	36.4

6. Tightening Torque Reference

Reference torque values for lubricated condition (0.12). Actual torque depends on lubrication, surface finish, joint geometry, and serration/coating condition. Always validate with joint testing for safety-critical applications.

Size	Class 6 Proof (kN)	Class 8 Proof (kN)	Class 10 Proof (kN)	Class 12 Proof (kN)
M6	8.2	10.9	13.8	16.2
M8	19.7	26.3	33.3	39.3
M10	39.1	52.1	66.1	78.0
M12	68.2	91.1	115.4	136.5
M16	169.2	226.6	287.5	339.4
M20	330.3	442.4	560.9	662.1

Nut proof load values (kN). Actual torque depends on bolt grade, lubrication, and joint geometry. =0.12 lubricated reference.

7. Surface Treatment Guide

Treatment	Thickness	Corrosion Resistance	Color	Best For
Zinc Plated	5 8 m	48 72h NSS	Clear/Blue	General indoor use, cost-effective
Black Oxide	1 3 m	24 48h NSS	Black	Aesthetic, light protection
Hot-Dip Galvanized	40 60 m	500+ h NSS	Matte Gray	Outdoor, structural steel
Dacromet	8 12 m	500+ h NSS	Silver/Gray	Automotive, offshore
Geomet	5 10 m	500+ h NSS	Silver	Environmentally preferred, Cr(VI)-free
Zinc-Nickel	8 15 m	1000+ h NSS	Clear	High corrosion demand, EV battery
Passivated (Stainless)	N/A	Excellent	Silver	Cleanroom, semiconductor, food grade

8. Quality Standards & Testing

Dimensional compliance per DIN 934 / ISO 4032
Proof load test per ISO 898-2 (steel) or ISO 3506-2 (stainless)
Hardness test per ISO 6507-1 (Vickers HV)
Thread inspection: GO/NO-GO gauge per ISO 1502
Salt spray (NSS) per ISO 9227; Zn-Ni for EV battery external connections
Prevailing torque variants available: DIN 985 (nylon insert), DIN 980V (all-metal)
3.1 / 3.2 certificates; PPAP Level 3 for automotive program nuts

ScrewTool®

shscrewtool.com

Fastener Weight Calculator

Instant weight calculation for 100+ DIN/ISO/ASME standards
Carbon Steel Stainless A2/A4 Brass Aluminum Nylon
Metric (M1.6 M100) and Inch (#0 4)

shscrewtool.com/fastener-weight-calculator

Instant results no registration One-click Excel export 100% free

BOM Optimization Tool

Upload your Bill of Materials for AI-powered fastener optimization
Duplicate detection SKU consolidation Cross-standard equivalency
Material & surface treatment recommendations per target market

shscrewtool.com/bom-tool-fastener-list-optimization

Typically 15 30% SKU reduction DIN/ISO/GB/JIS/ASME cross-reference Export optimized BOM

Need fastener solutions for your industry?

Home Appliance Electric Vehicle Semiconductor

Contact engineering team: info@shscrewtool.com