PREVAILING TORQUE TYPE ALL METAL HEXAGON NUT 'FS-RS'

RS TECHNOLOGIES

(In collaboration with Flaig + Hommel GmbH)

FS-RS All-Steel Lock-Nut:

Competent reliability even under extreme pressure!

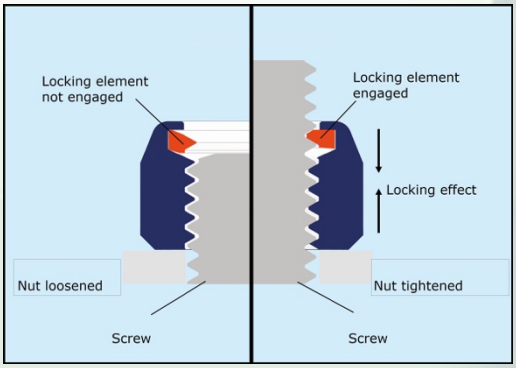
Fastening problems with dynamically highly stressed threaded joints have lead to the development of the FS-RS all-steel lock-nut. It has a flexible and completely threaded locking element which is fitted into the nut body.

As opposed to competitors' lock-nuts, the FS-RS all-steel lock-nut can be used universally. This is due to the fact that the design combines all elements required for a safe threaded connection, such as re-usability, heat resistance, corrosion resistance, protection of the counter thread and narrow tolerance of the locking torque.

The FS-RS all-steel lock-nut can be reused many times without significant loss of its locking capability and exceeds, after 15 times of tightening and loosening of the nuts, the values given in DIN EN ISO 2320.

ASSEMBLY ADVANTAGES

• Cost- and space-effective automated assembly instead of castellated nuts, split pins, counter nuts, etc.



BASIC ADVANTAGES

• The FS-RS all-steel lock-nut offers double safety. The locking element works both in radial and axial direction. Thus, the locking effect remains fully operational even after repeated unfastening of the FS-RS lock-nut.

• The FS-RS all-steel lock-nut locking element, which is offset but otherwise conforming to standard thread sizes, prevents the counter thread from being damaged.

• Economical storage due to universal use.

High heat resistance up to 1000 °C

Examples of application:

INDUSTRIAL AREAS		COMPONENTS	ATTACHING
1. automotive industries	1.1	engine exhaust	high temperature area of the exhaust system
	1.2	turbo charger	turbo to engine manifold
	1.3	wind shield (bottom area)	chassis
	1.4	heat shield (engine cover)	engine compartment
2. automotive supply industries	2.1	retarder-hydraulic brake system	installation in vehicle
	2.2	heat exchanger of retarder brake	heat exchanger / hydraulic-brake
	2.3	servo-hydraulic pump	secure mounting of the toothed gear on the shaft
	2.4	exhaust system catalytic converter	weld nuts for repairing and replacement of components
	2.5	shock absorbers	piston rod to chassis
3. chassis and special automotive engineering applications	3.1	pneumatic cushion units	to the axle
	3.2	turn table of hydraulic jib trucks	to the chassis
	3.3	stationary wheel-support (between turnable and axle)	length adjustment of the wheel support
4. process plant and machinery, building industry	4.1	high-speed milling machine 18 000 rpm-shock breaked	the milling tool and the drive shaft
	4.2	plate valves of reciprocating compressor	spring steel pressure valve
	4.3	abrasion plate attaching (hot rolling mill)	in areas of the furnace
	4.4	liquid filters (aggressive chemicals)	filter components and inserts

INDUSTRIAL AREAS		COMPONENTS	ATTACHING
5.Rolling Stock Industries **Railway locomotives and rolling stock equipment German Railway System Deutsche Bahn AG in BN 205 107-1 and StW 508.51.022**	5.1	bogies	fixing off all components (brakes, etc.)
	5.2	engine suspension	on the frame (chassis)
	5.3	braking system	disk brakes, brake cylinders and frames
	5.4	rubber/steel mounting blocks	on the steel wheels
	5.5	wheel shock and noise absorber	
6. magnetic hover train	6.1	stator and rotor	to the train
	6.2	magnetic packages	and track
7. lifting equipment	7.1	steering swivel (fork trucks)	attaching and adjusting of the wheel bearings
	7.2	hoist equipment	attaching of the fixing hook bolt
8. ship and boat construction	8.1	propeller	propeller to the propeller shaft

TECHNICAL ADVANTAGES

• **The clamping force is adjustable during manufacturing within fine tolerances.**

• The FS-RS all-steel lock-nut can withstand temperatures up to 1000 °C. For use within temperatures in excess of 300 °C, suitable heat resistant materials are being employed depending on the application.

• High axial loads are granted as threads are manufactured to DIN EN ISO 2320 standards.

• **The nut measurements** meet the requirements of the standards DIN EN ISO 7042 / DIN EN ISO 10512, DIN 6925, DIN 980 M and DIN 6927 /DIN EN ISO 1667 / DIN EN ISO 1664 (flange nuts).
Special designs with **reduced height** are available. Please talk to our engineers.

BENEFITS

• Reliable even in difficult screwed connections such as used in turbochargers, exhaust manifolds, catalysts, highly stressed gearboxes, superchargers and vibrating machine components.
• The FS-RS all-steel lock-nut has proven itself over many years and has created a host of new possibilities to crack old problems (new solutions to old problems).
• The FS-RS All-Steel Lock-Nut are resistant to high temperatures and corrosion due to modern technologies, resulting in better reliability than galvanizing. These techniques have been accomplished without inducing hydrogen embrittlement.

FS	RS

Technical Facts:

Property class: 04, 05, 8, 10, 12
Special materials:
Highly heat resistant materials:
1.7218 25CrMo4 KG
1.7225 42CrMo4 GC
1.7709 21CrMoV5-7 GA
1.4923 X22CrMoV12-1 V (VH)
1.4980 X6NiCrTiMoVB25-15-2 SD
Rostfreie Stähle:
A2-70, A2-80, A4-70, A4-80, 1.4571

Surface coatings: galvanized surfaces according to DIN EN ISO 4042
Dacromet, Delta-Ton, Zinc-Iron
Zinc-Nickel, hot-dip galvanization Zinc Flake etc.

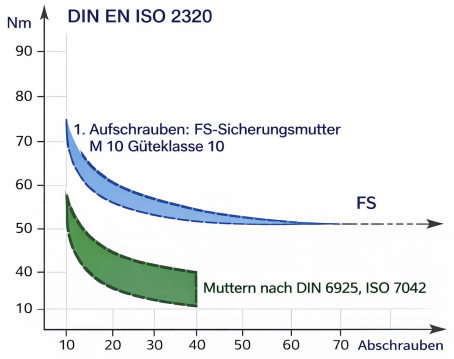
Threads: Metric: standard- and fine threads. Imperial: standard- and fine threads. All other threads available on request.

TECHNICAL DATA

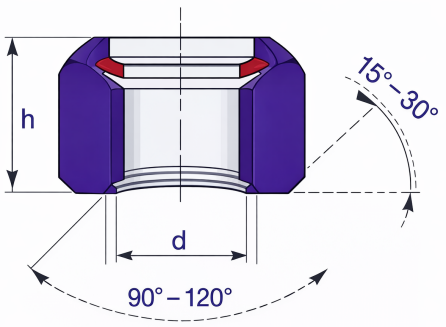
Design acc. to:
DIN EN ISO 7042, DIN EN 1664,
DIN EN 1667, DIN 980, DIN 6925 (old type)

Mechanical properties:
DIN EN ISO 2320 (DIN EN 20898-2/
DIN EN ISO 898-6)

Surface coatings:
DIN EN ISO 4042 – galvanic surface coatings (also Cr 6-free), Delta-Tone, Zinc-Iron, Zinc-Nickel, Hot Dip galvanized, Geomet, Delta-Protect, QPQ, Phosphate, Dacromet, Zinc Flake etc.



Prevailing torques



Design

(metric) mm				Prevailing torque (Nm)		
d	h	s	e min.	1st application max.	1st unscrewing min.	15th unscrewing min.
M 5	5	8	8,79	1,6	0,29	0,2
M 6	6	10	11,05	3,0	0,45	0,3
M 8	8	13	14,38	6,0	0,85	0,6
M 10	10	16	17,77	8,0	1,5	1,0
M 10	10	17	18,90	8,0	1,5	1,0
M 12	12	18	20,03	12,0	2,3	1,6
M 12	12	19	21,10	12,0	2,3	1,6
M 14	14	21	23,36	16,0	3,3	2,3
M 14	14	22	24,49	16,0	3,3	2,3
M 16	16	24	26,75	25,0	4,5	3,0
M 18	18	27	29,56	28,0	6,0	4,2
M 20	20	30	32,95	30,0	7,5	5,3
M 22	22	32	35,72	40,0	9,5	6,5
M 24	24	36	39,55	45,0	11,5	8,0
M 27	27	41	45,63	50,0	13,5	10,0
M 30	30	46	50,85	60,0	16,0	12,0
M 33	33	50	55,37	70,0	18,0	14,0
M 36	36	55	60,79	75,0	21,0	16,0
M 39	39	60	66,44	90,0	23,0	18,0
M 42	42	65	72,61	100,0	30,0	20,0
M 48	48	75	83,91	130,0	40,0	25,0
M 56	56	85	95,07	160,0	50,0	30,0
M 64	64	95	106,37	200,0	60,0	35,0

Tightening torques (Nm) as per IS 1367 (Part 8) : 2002 / ISO 2320 : 1997					
Property class	8		Recommended (Nm)	Clamping Force	
	Min (Nm)	Max (Nm)		Min (N)	Max (N)
M 6	8.4	12.4	10	7540	8700
M 8	20	30	25	13780	15900
M 10	41	60	50	21905	25275
M 12	71	105	86	31785	36675
M 16	175	260	215	59150	68250
M 20	355	520	430	95550	110250
M 24	620	928	735	137800	159000
M 30	1230	1810	1450	219050	252750
M 36	2140	3160	2520	318500	367500

Tightening torques (Nm) as per IS 1367 (Part 8) : 2002 / ISO 2320 : 1997					
Property class	10		Recommended (Nm)	Clamping Force	
	Min (Nm)	Max (Nm)		Min (N)	Max (N)
M 6	12.1	17.8	16	10855	12525
M 8	29	43	38	19760	22800
M 10	59	85	75	31265	36075
M 12	102	150	128	45500	52500
M 16	250	371	315	84500	97500
M 20	491	718	605	131950	152250
M 24	857	1283	1040	190450	219750
M 30	1701	2503	2060	302900	349500
M 36	2961	4368	3570	440700	508500

** Recommended tightening torque to achieve the **Clamping Force**
(Holding force between nut & bolt)

Manufactured by RS TECHNOLOGIES

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Our Clients

Bharat Heavy Electricals Limited

Indian Railways

Siemens

Medha Traction Equipment Pvt. Ltd.

Ved Sassomeccanica (India) Pvt. Ltd.

ECBT

Ramkrishna Forgings Limited

Alstom