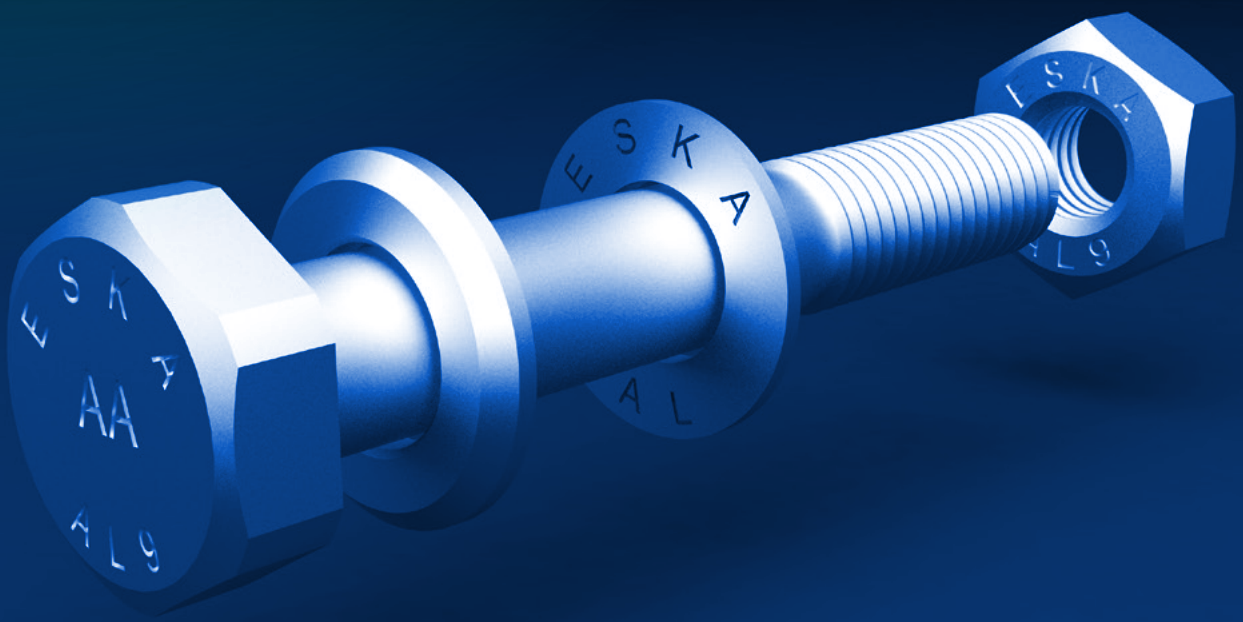
ESKA®

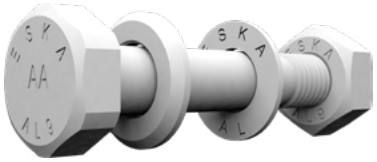
perFORMING in perfection

ESKA® - HA-SCHRAUBEN-GARNITUREN®

made of high-strength aluminium for preloadable aluminium constructions and structures with higher corrosion protection and reduced weight

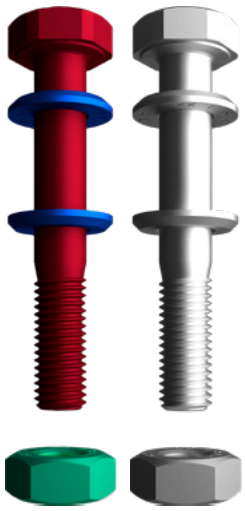


Description/Fields of application



HA-SCHRAUBENGARNITUREN® from ESKA® are made of a high-strength aluminium alloy for preloaded joints to connect aluminium constructions and structures in aluminium building industry. This is the first aluminium system solution world-wide with general building inspection approval according to abZ in the tightening process with optimised preload force.
The HA-SCHRAUBENGARNITUREN® from ESKA® are suitable for all industrial applications in which light-metal components have to be tightened safely under the aspects of weight saving, constant preload force, and corrosion optimisation. Thus, light-weight construction concepts can be implemented in a persistent, safe, and visually appealing manner. Torques and preload forces have been confirmed by inspections in terms of general building inspection approval.

HA-SCHRAUBENGARNITUREN® from ESKA® vs. HV-bolt-set according to DIN EN 14399-1 after 1008 hours of salt spray test (screwed in aluminium)



Advantages

of HA-SCHRAUBENGARNITUREN® from ESKA®

- Approx. 65 % weight saving as compared to steel bolts of same size
- No visual depreciation due to rust in association with aluminum components due to preverted contact corrosion
- Enhanced resistance to corrosion and applicable without additional coating
- Reduced maintenance efforts thanks to the consistency of preload forces over time and temperature, thus ensuring sustainable joint durability
- Extended product range even for dimensions smaller than M12 as compared to the system solutions HV and HR according to DIN EN 14399
- Visual upgrade of joints thanks to coloured anodic coats
- As compared to the HV steel system solution, the notched-bar impact work in the lower temperature range (-40°C) will not decrease; material embrittlement will not increase.

Fields of application

- **Aluminium Design & Arts**
  Bridge construction, buildings, support structure buidling
- **Renewable energies**
  Solar panels, photovoltaic installations
- **Infrastructure & industry**
  Railway facilities, antenna construction, conveyor technology, tunnel equipment

Product properties

Characteristic features			HA-bolts	HA-nuts	HA-washers
Tensile strength	R_m	[MPa]	≥ 410		
Yield strength at 0,2 %	$R_{p0,2}$	[MPa]	350 - 400		
Elongation at break of a prepared test sample in percent	A	[%]	≥ 7		
Vickers hardness	HV10		≥ 125	≥ 125	≥ 99
Brinell hardness	HBW		≥ 120	≥ 120	≥ 94
Chemical composition			EN AW-6056 (AlSi1MgCuMn)	EN AW-6056 (AlSi1MgCuMn)	EN AW-6082 (AlSi1MgMn)
Thread tolerance			6g	6H	
Heat treatment condition			T6	T6	T6

Available dimensions of HA-SCHRAUBENGARNITUREN®		
Thread dimensions* (nominal diameter in mm)	Shaft length in mm	Maximum thickness of clamping pack in mm
M8	40 - 85	71,85
M10	45 - 155	138,95
M12	50 - 155	134,90
M16	60 - 175	149,40
M20	75 - 175	145,90

*other dimensions on request

	Torque-controlled preload		Combined preload procedure		
Dimensions (nominal diameter d in mm)	Tightening torque 3rd tightening step $M_{A,HA-DV}$ [Nm]	Preload force $F_{p,c-HA*}$ [kN]	Tightening torque 2nd tightening step $M_{A,HA-KV}$ [Nm]	Prevailing angle Δ [1] for t [2]	Preload force $F_{p,c-HA}$ [kN]
M8	11	9	8	< 2d: 60° 2 - 6d: 90° 6 - 10d: 120°	11
M10	22	14	15		17
M12	35	21	25		24
M16	90	40	65		45
M20	170	60	120		70

[1] according to DIN EN 1090-2 and Table 48

[2] t: total nominal thickness of the parts to be connected (including all filler plates and washers)