

## RIBE ALUFORM

EXTERNAL HEXAGON  
HEAD ROUND  
BOLT

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INTERNAL HEXAGON  
HEAD ROUND  
BOLT

Technical product data sheet

# RIBE<sup>®</sup> ALUFORM AL9 – CREATING LIGHTWEIGHT CONNECTIONS

The connection solution for lightweight metal applications and electrical contact joints.

## › THE RIBE<sup>®</sup> ALUFORM BOLT

**Technology and market leader with more than 20 years of expertise from aluminum bolt design and manufacturing to application consulting.**

Lightweight metals are being used more and more frequently in all areas of technology, and they require connections adapted to the material. With Aluform bolts, RIBE is the market leader in terms of quantity and technology in these applications. At RIBE, all process steps involved in the production are combined in a dedicated aluminum production line. As a result of our many years of experience and technical innovations in alloys, heat treatment and surface coating, RIBE-Aluform bolts are now used in many automotive and industrial applications.

## › THE RIBE<sup>®</sup> ALUFORM ADVANTAGES

**Lightweight, reduced thread engagement, minimal preload loss due to similar thermal expansion, and high electrical conductivity.**

Fasteners made of aluminum alloys paired with magnesium or aluminum components offer significant advantages over steel bolts. These benefits include 60 % weight savings, maintaining a high preload level during thermal cycling, the avoidance of galvanic corrosion and significant cost-saving potential. The entire bolt connection point can be optimized for weight savings in addition to the weight advantages offered by the aluminum bolt itself. RIBE Aluform bolts are the perfect fasteners for electronic connection applications thanks to their low contact resistance, stable clamping force and conductivity.



◀ RIBE Aluform RIBE application examples

## ▶ TECHNICAL DATA

<b>Dimensions</b>	M4 - M12
<b>Material</b>	"AlMgSiCu" Al alloy according to SN 9.6056
<b>Yield strength</b>	$R_{p0.2}$ min. 350 N / mm <sup>2</sup> max. 400 N / mm <sup>2</sup>
<b>Tensile strength</b>	$R_m$ min. 400 N / mm <sup>2</sup> max. 450 N / mm <sup>2</sup>
<b>Elongation at break</b>	$A_{2d} \geq 6 \%$
<b>Conductivity</b>	30 m / $\Omega$ mm <sup>2</sup>
<b>Application temperature</b>	max. 150°C
<b>Surface coating</b>	RIBE-Lub, Al-phosphated + RIBE-Lub, RIBE-Lub IK+

## ▶ LIGHTWEIGHT MANUFACTURING WITH RIBE® ALUFORM

The direct substitution of an 8.8 steel bolt with the RIBE Aluform enables a weight reduction of 60 % compared to steel bolts due to its lower density. Further secondary weight savings can be achieved through an optimized flange design, reduced thread depth and the use of through holes. Particularly in space-efficient electrical contact joints, contact safety is enhanced due to the inherent resistance being three times better than that of a steel bolts.

### Application example Transmission fittings

<b>Bolt dimensions</b>
<b>Bolt material</b>
<b>Bolt weight</b>
<b>Assembly</b>
<b>Prestressing force</b>
<b>Contact resistance: Busbar example</b>

RIBE ALUFORM	
M8 x 36 AL9	M8 x 40 8.8
EN AW 6056-T6, strength class AL9	Standard material, strength class 8.8
7.3 g	24 g
8 Nm + 90°	30 Nm
13 kN	10 kN
48 $\mu\Omega$	142 $\mu\Omega$

## ▶ GUIDELINE VALUES FOR BOLTS WITH STRENGTH CLASS AL9

Dimensions	M4	M5	M6	M8	M10	M12
<b>Minimum breaking torque <math>M_b</math> (Nm)</b>	1.9	4.1	6.8	16.8	33.2	57.1
<b>Minimum tensile strength <math>R_{m, \min} \cdot A_s</math> (kN)</b>	3.4	5.5	7.8	14.2	22.6	32.9
<b>Joining torque* <math>M_F</math> (Nm)</b>	1	2	3	8	15	25
<b>Prestressing force** <math>F_M</math> (kN)</b>	3	5	7	13	21	30

Thread dimensions and stress cross sections refer to 6 g

\* Data applies to tightening controlled by angle of rotation; additional angle of rotation  $\varphi = 90^\circ$  for clamping length 1d to 5d;  $\varphi = 180^\circ$  for clamping length over 5d

\*\* typical values at  $\mu_{ges} = 0.11$ ; utilization factor  $n = 1.1$ ; yield strength  $R_{p0.2} = 370$  N / mm<sup>2</sup> and head geometry according to WN 17005

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