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P r e s s r e l e a s e f o r t h e H a n o v e r f a i r

Prospects with potential – Aluminium lead screws

Lightness with heavyweight – Aluminium lead screws

(about 9'500 characters including spaces, no legends or profiles, 3 images)

((Main title))

Development and deployment of new materials are the decisive factors for competitiveness

((Lead))

Lightweight construction materials and lightweight construction technologies are major driving forces behind innovations in many sectors. In the future, resource and material efficiency will be the determining factors for the competitiveness and success of companies working in the manufacturing industry. More lightweight materials capable of sustaining load have become indispensable for aerospace applications, and are already playing a key role in vehicle manufacturing and in the medicinal sector for example. Eichenberger Gewinde AG is successfully demonstrating that the potential of lightweight construction using aluminium brings with it essential relevance and entails extraordinary benefits - even for the simplest of mechanical drive components. Challenges can be overcome. Engineers at Eichenberger are developing on a continual basis - inspired by the diversity of aluminium as a material and spurred on by constructive dialogue with customers. In addition to steel ball screws, and round thread / high-helix solutions, aluminium round thread and high-helix lead screws are being designed and manufactured for a very broad range of applications.

((Subheading))

Technical advancement and the strictest demands made of mechanics go hand-in-hand

How can equipment and power be bundled so that we can work more sparingly with limited raw materials, and not least of all cut costs? Progressive technologies provide

the answers for many process improvements. Eichenberger is based in Switzerland and has dedicated itself primarily to the rolling, so cold-forming, of threads and the production of ball screws and lead screws (spindle and nut). The thread specialist is fully aware of the fact that technological capability also entails strictest requirements made of the effectiveness of mechanics, and is leveraging the opportunities.

((Subheading))

Whenever reliability and speed are called for

((Normal text))

A door system of a bus must ensure doors are opened quickly and safely first and foremost. In winter when temperatures are below zero, and with snow and salt, perfect functioning must be guaranteed just as it is in summer, in periods of hot weather when dust and dirt deposits are everywhere. Attributes such as speed, service life, efficiency and precision are therefore required. This is where the Speedy high-helix lead screw boasts outstanding properties. The thread specialist from Switzerland has optimised and industrialised the Speedy high-helix movement screw. Unusual customer solutions are being developed in a broad array of application fields on the request of customers. Responses in the form of prototypes can be realised within a few weeks.

((Subheading))

Successful search for pioneering spirit

For its new development project, a leading and highly-specialised manufacturer of high-tech bus door systems researched progressive materials, advanced manufacturing processes and flexible development partners having extensive expertise. The company scoured the Internet and found what it was looking for - the rugged, cold-rolled aluminium round thread and high-helix lead screws from Eichenberger. Now a perfectly integrated, tailored, aluminium Speedy high-helix lead screw solution, with a screw diameter of 16 mm and pitch of 90 mm in the innovative opening mechanism, manages the highly effective movement of the bus doors. The high-helix lead screw features a high level of technical and quality finishing and helps the manufacturer achieve the following impressive figures:

((Subheading))

Aluminium provides justification for best figures

Despite its low weight, aluminium as a light metal with a density of 2.7 g pro cm³ boasts a high level of rigidity and many positive material properties. The level of enthusiasm is high - for a metre of Speedy lead screw (16 mm x 90 mm), the weight is 0.533 kg. A metre of the same screw in steel would weigh 1.549 kg. The high-helix lead screw enables the efficient implementation of linear and rotation movement, and highest movement speeds at low rotation speeds are possible. Also, the perfect combination of aluminium, nut and lubrication means an impressive efficiency of 0.8 is achieved. This enables the engineer to leverage cheaper parts, such as a motor, which can be reduced as regards performance. According to the bus manufacturer, three door entrances are fitted per vehicle in this state-of-the-art door system. Thanks to the use of aluminium in the entire door area, and support from Speedy, a weight reduction of up to 35 kg per door is achieved compared to the conventional solution. This generally means two more passengers can travel in the bus. Vehicle weight savings are essentially a key component in reducing fuel consumption, and so associated CO₂ emissions.

((Subheading))

Positives making themselves evident

Machineability: The manufacturer of the new door system emphasizes the outstanding and cost-effective machineability of aluminium. The silver-white, easily formable metal is impressive all round. Aluminium is in no way inferior to steel as regards tolerance compliance. It is well known that high cutting data can be used. Tool wear is 10 to 25 times lower than is the case for steel. The machining times for end machining in the production process are also much shorter. The light metal 16 x 90 high-helix lead screws are available from Eichenberger Gewinde AG at prices 5 to 10% lower than their counterparts made of steel.

The anodisation of aluminium, also called anodic oxidation and eloxadizing, is a proven and common method for surface finishing of aluminium. The result of the

eloxadizing process is an extremely hard, scratch-resistant surface which reduces the friction coefficient and reliably guarantees protection against corrosion, and thereby contributes greatly to prolonged service life. Layer hardnesses attainable are dependent on the aluminium alloy used, and range between 350 and 600 HV (Vickers hardness). The dimensional accuracy of the workpiece can be calculated exactly because aluminium can be coated within tolerances. 1/3 of the coating created is visible as application, and 2/3 of the layer diffuses. Layer thicknesses of 5 to 30 µm are usually attained in the eloxadizing process. In contrast to other metal coating processes which are demanding in the machining process and for which handling is complex, the handling of anodised aluminium screws is straightforward.

Did you know that aluminium packaging is collected as a valuable collector's item in Switzerland? Of ten empty aluminium drink cans, a proud nine end up being recycled. Aluminium is a sustainable material and fully recyclable. Whilst the extraction of aluminium is energy-intensive, used aluminium can be melted down without problem and be fully recycled. Only 5% of the energy is used up in the process. Recycled aluminium is on a par with primary aluminium as regards quality.

((Subheading))

Aluminium Rondo and Speedy are MRT-compatible

Magnetic resonance tomography (MRT) is one of the imaging examination methods. Unlike X-rays and computer tomography, it requires no "X-ray radiation". In the MRT process, detailed images of the inside of the body are generated by means of a strong magnetic field and radio waves. It creates sectional images of the human body in any direction. The MRT process enables tissue changes and functional failures of organs to be identified in 3-D form without any risk ascertained thus far.

It is on the spine in particular that the cause of pain can often not be located with conventional MRT examinations. Discomfort is commonly and erroneously put down to harmless intervertebral disc swelling, and can result in unnecessary operations. The application of a special MRT contrast agent on the other hand enables centres of inflammation responsible for pain to be verified reliably and be subjected to targeted treatment.

Non-ferromagnetic materials are therefore a prerequisite in the production of radiology equipment. Eichenberger's sliding lead screws, made of aluminium and magnetically neutral, are used in the injector drive unit for MRT contrast agent. According to the leading manufacturer of radiology devices, the cold-formed Rondo and Speedy round thread and high-helix lead screws are indispensable for this high-tech equipment. The slide screw units are not affected by the magnetic fields and are MRT-compatible. The exceedingly good tribological properties of the smooth aluminium surface of the Speedy and Rondo, influenced positively by the rolling process, raise the profile in the medical sector where sterility is absolutely vital. The excellent sliding properties of aluminium are also a stand-out feature. They of course always work depending on the opposite sliding contact surfaces. The excellent pairing between the aluminium screw and the highly wear-resistant synthetic nut is an impressive feature of the Rondo and Speedy sliding lead screws. Dry running and low maintenance are even possible for certain applications and corresponding coating. The production core competence of thread rolling brings with it many benefits. In addition to the considerable increase in strength due to cold forming, and reduced notch sensitivity, the fibre course of the metal is not interrupted by thread rolling. A high level of dimensional accuracy is also possible.

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((Portrait))

Development service provider

Eichenberger Gewinde AG is a company with clear goals: The rolling - as in cold forming - of threads and the manufacturing of lead screw assemblies (spindle and nut). Eichenberger supports "the customer's" innovations through the use of state of the art production methods and by developing new dimensions.

- «**Carry**»: Ball screw for applications where heavy loads must be moved with low energy consumption.
- «**Carry Speedline**»: Wear-free high-helix ball screw for high moving speeds. The patented recirculating design combines low mass with a good price.
- «**Speedy**»: The high-helix lead screw converts rotational motion into linear motion with high moving speeds.
New: Some versions available in aluminium.
- «**Rondo**»: The round thread lead screw with very quiet running properties. **New:** Some versions available in aluminium.

((Caption))



Speedy aluminium lead screws



Speedy aluminium lead screws, \varnothing 26 mm, pitch 6 mm