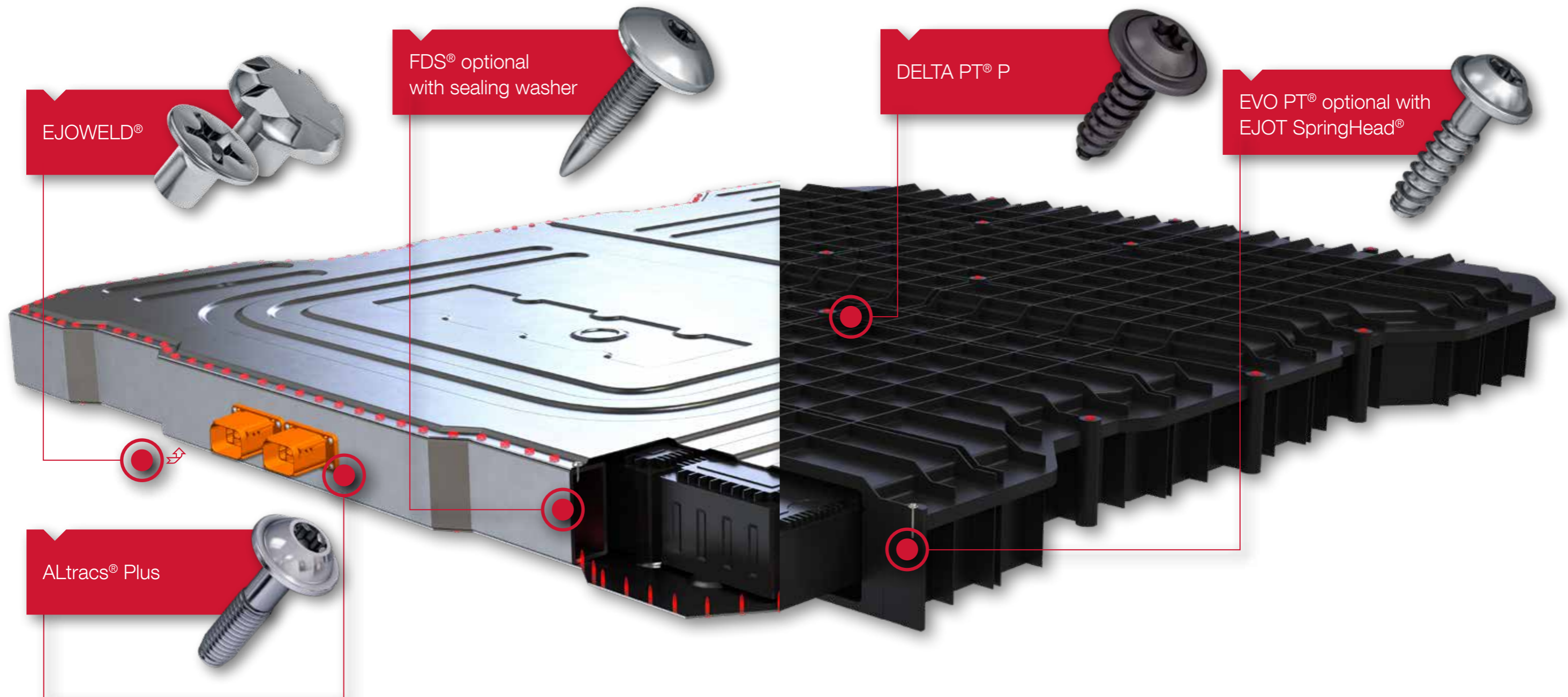


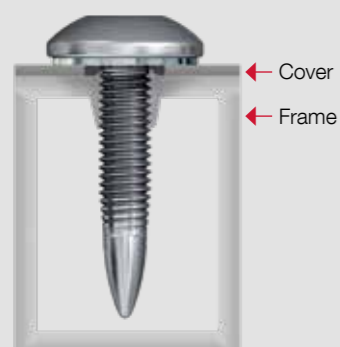


# EJOT® product and service concepts for battery systems

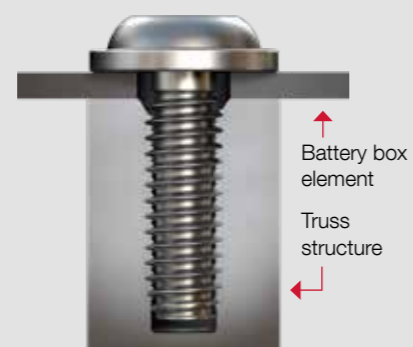
Fastening solutions for e-mobility



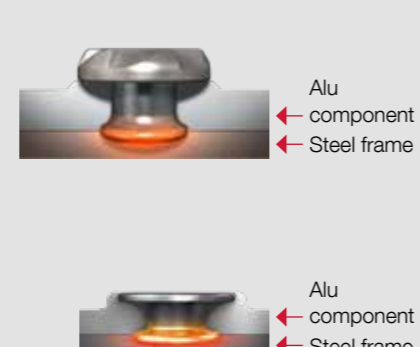
**FDS® with sealing washer**  
Fastening the battery box cover to the frame



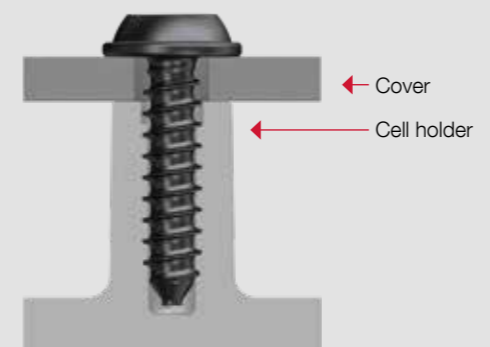
**ALtracs® Plus**  
Fastening of battery box elements to the cast truss structure



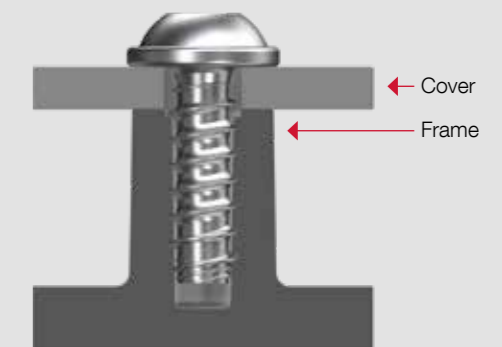
**EJOWELD® CFF and SRE**  
Reliable joining of alu components to the battery frame



**DELTA PT® P**  
Fastening the cover with the cell holders inside battery systems



**EVO PT®**  
Fastening the battery box cover to the frame



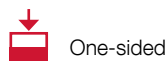
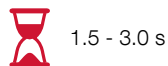
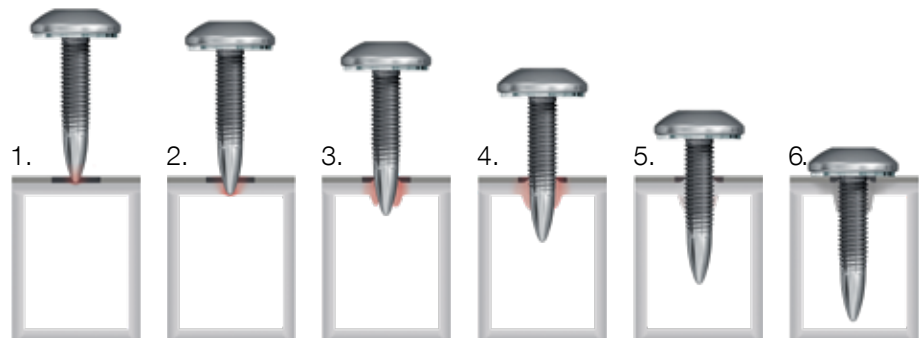
# FDS®

## Flow-drill screw connection - optional with additional sealing function



A pre-assembled embossed aluminium sealing washer ensures an under-head seal of this innovative version of the FDS® screw. The washer prevents the ingress of water. The waterproofing function is achieved by the sealing surface of the aluminium washer, which means that there is no need for additional sealing of the screw head. Pre-drilling of the clamping part is necessary, because without a pilot hole the rising material affects the water tightness. The sealing function in connection with economic installation options are specific reasons why the FDS® screw is the ideal option for the demanding use in battery systems. The FDS® screw without sealing washer is also suitable for a variety of possible applications in battery systems.

### Assembly stages:



Product animation:



1. Warming up
2. Penetration of the material
3. Forming of the draught
4. Thread forming
5. Full thread engagement
6. Tightening



Detailed view

### Advantages:

- One-sided assembly
- Removable and high-quality joints
- No material waste while forming the draught / no chips during thread forming
- Easy removal and recycling
- Optional: sealing on the head side through embossed sealing washer

# EJOWELD® friction element welding

Fastening light metal sheets with advanced high strength steel without pilot hole



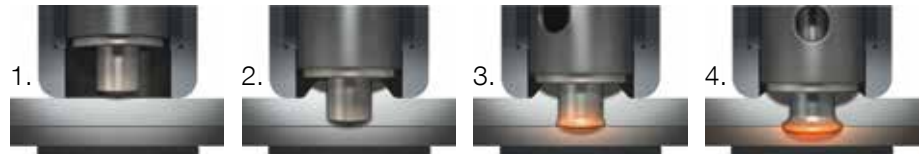
EJOWELD CFF®



EJOWELD SRE®

The EJOWELD CFF® friction element enables the pilot hole free joining of light-weight materials with high-strength sheet metal by means of friction welding. The large head with a hollow under the head and the different lengths of the element offer a large application window in the field of battery systems. The SRE friction element is 30 % smaller than the CFF element. Due to its geometry, the SRE element is ideally suited for joining narrow flanges with small head projection.

## Assembly stages:



0.7 - 2.0 s



Two-sided

1. Penetration of the cover sheet (lightweight material)
2. Cleaning and activation of the surfaces
3. Plastification of friction element and base plate
4. Compression / forming the welded joint

Product animation  
EJOWELD CFF®:



Product animation  
EJOWELD SRE®:



## Advantages:

- Joining without pilot hole
- No pre- or post-treatment of the joined plates
- No intermetallic phases
- Fully automated assembly possible
- Corrosion-resistant and waterproof joint, since the lower plate is not pierced
- Low energy balance compared to spot welding

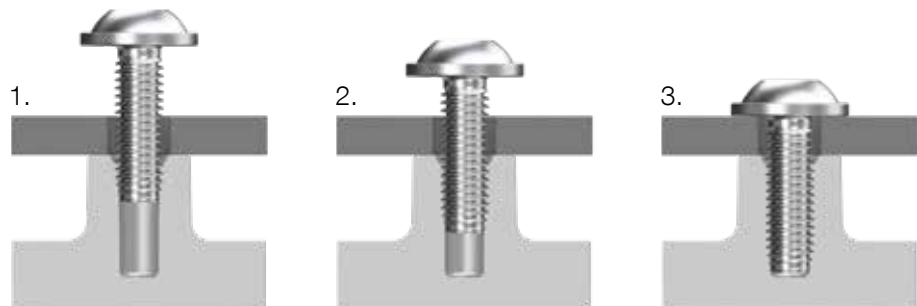
# ALtracs<sup>®</sup> Plus

The „specialist“ for light metal applications



EJOT ALtracs<sup>®</sup> Plus screws are thread-forming fasteners developed for maximum strength values in light alloys and other non-ferrous metals. The fastener is designed for direct assembly into cast holes. This results in significant cost savings compared to metric screws. Due to the special combination of the highest fastening performance and economic efficiency, this screw is ideally suited for fastening battery box elements or attachments made of cast materials. The ALtracs<sup>®</sup> Plus with optional EJOT SpringHead<sup>®</sup> reduces the effects of possible relaxation with increased thermal stress.

## Assembly stages:



1.2 - 1.8 s



One-sided

Product animation:



1. Application and forming of the first threads
2. Thread forming
3. Final tightening

## Advantages:

- High installation safety due to high stripping torque
- High and stable clamp loads due to reinforced female thread flank
- Minor tendency to creep under thermal and/or dynamic stress due to large thread flank engagement
- Possible reduction of installation depth, i.e. shorter screw lengths, smaller component sizes, less weight, reduced wear and tear of the die casting tools
- Good repeat assembly properties

## EVO PT®

### The evolution of direct fastening into plastic



The EVO PT® screw is an innovative fastening solution for direct assembly into thermoplastic material. It combines new digital tools and features such as the innovative forming thread for depth-independent installation torques or the lead-in thread for straight centering of the screw. The calculation service EVO CALC® and the FEM-based part analysis are the ideal option for the design engineering of battery housings made of plastic. The EVO PT® with optional EJOT SpringHead® and rolled-on washer reduces possible effects of relaxation.



0.8 - 1.1 s



One-sided

Product animation:



#### Advantages:

- Variable installation depths
- Compensation of different clamping part thicknesses
- Reduction of variants
- Prognosis program EVO CALC®
- More planning safety with numeric calculation (FEM)
- Computer-aided engineering for complete assembly groups (CAE)

## DELTA PT® P

### DELTA PT® made of plastic for direct assembly into soft thermoplastics



To reduce the use of metal elements in battery systems, the DELTA PT® P made of plastic is the ideal screw to use for battery cell holders inside battery systems. This safely prevents risk factors such as corrosion or short circuits and significantly reduces the weight compared to the use of steel screws.



0.8 - 1.1 s



One-sided

Product info:



#### Advantages:

- Weight savings
- No corrosion or short circuits
- Recyclable
- High insulation resistance
- Non-magnetic
- Higher loosening torque than steel screws

# Our special services

For your fastening project in battery systems

## Engineering

Our application engineers will support you directly on site, especially when it comes to demanding, technical joining questions in the area of battery systems.



## CAE services

Special CAE services are available for the EVO PT® screw, for example FEM-supported component analysis to identify the point with the highest load.



## Online services

Our online services are available 24/7 digitally on the EJOT website: This includes download options for CAD data, the use of APPLICATION CHECKS and various prognosis programs.



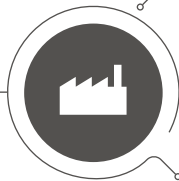
## Application engineering laboratory

In the APPLITEC test laboratory, our experts examine your individual component and its fastening points and then give helpful design recommendations in a comprehensive test report.



## Technical cleanliness

For special cleanliness requirements, the EJO CLEAN® range offers individual solutions to use "clean" fastening elements in assembly.



## Sustainability

Since removable connections are made with EJOT screws, these support the material-compatible recyclability of the battery components by easy disassembly of the battery systems. EJOT carries out a detailed analysis of the carbon footprint for all business processes and products in order to analyse, document and continuously optimise the energy requirements in production.

# EJOT®

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Subject to technical changes.