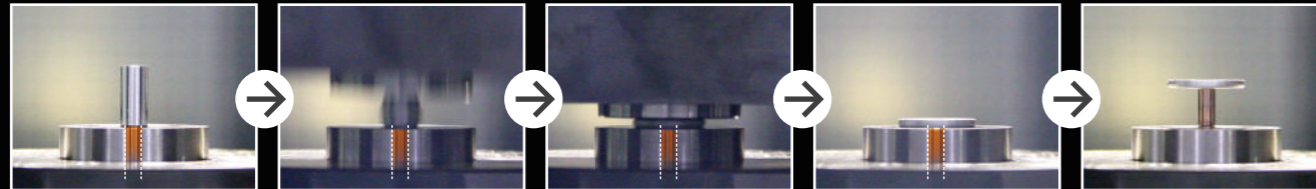


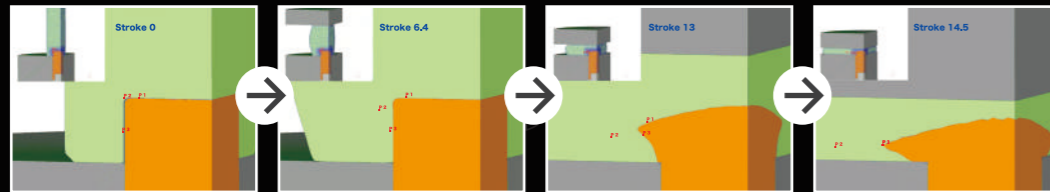
# AKROSE™

The Joining of Dissimilar Materials

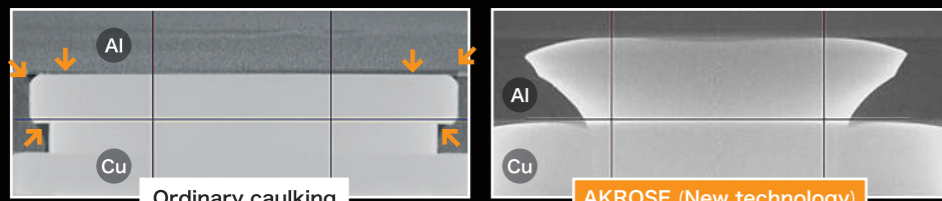
Pressing Sequence



FEM Analysis



X-Ray CT  
(360 deg. Rotation)



Unfilled gaps at arrowed points

Adherence without gaps

Examples of joining

**Improved extraction strength**

Al-Cu

[Cylinder] [Cross section]

[E groove] [Cross section]

[Screw] [Cross section]

**Improved torque resistance**

Al-Cu

[Cylinder] [Cross section] [Bearing surface of joined sections]

[Serration] [Cross section] [Bearing surface of joined sections]

[Hexagonal] [Cross section] [Bearing surface of joined sections]

**3 different types of materials**

Cu-Al-SUS

[Cross section]

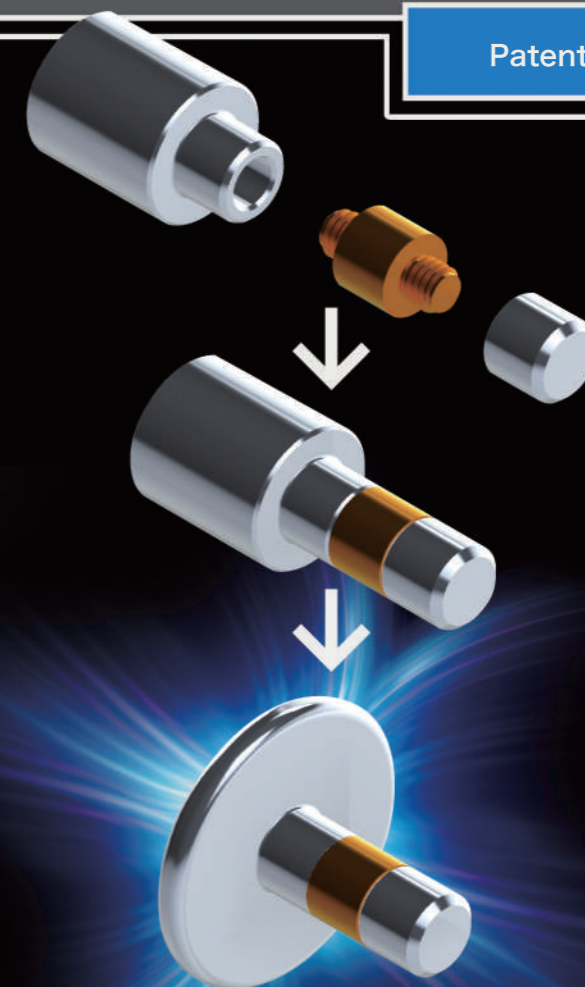
**5 different types of materials**

Fe-Al-Cu-Al-SUS

[Cross section]

Unique to NITTOSEIKO, AKROSE is the technology of tightly joining dissimilar materials by pressing them together after undergoing a cold-heading process.

Patented in Japan



**NITTOSEIKO CO.,LTD.**  
Fastener Division Global Sales Section

1-6-4, Honjyo-nishi, Higashiosaka city, Osaka, 578-0965, Japan  
TEL: +81-6-6745-8392 FAX: +81-6-6745-8372  
E-mail: sales@nittoseiko.co.jp  
URL: https://www.nittoseiko.co.jp/



● Specifications are changed without notice for the purpose of improvement of functions.

# NITTOSEIKO's cold-heading technology is an important contribution to the next generation of manufacturing

"Cold Heading" is the technology that distorts and then reshapes metal parts by pressing under normal temperature.

This process not only limits the amount of waste, but also helps maintain the strength of the material.

Furthermore, the process allows for high accuracy with less variation.

"AKROSE" is the new technology of tightly joining dissimilar materials using NITTOSEIKO's cold-heading technology which has evolved over decades of experience with development and production of industrial fasteners.



## Applications

Automotive, Batteries, Appliances, Electronics, Infrastructures, etc.

## Ordinary Joining Technologies and Their Weak Points



### Mechanical Joining

- Caulking, etc.

- Lack of adhesion
- Requires preparation of pilot holes
- Requires joints, thus more parts



### Chemical Joining

- Adhesive Agents, etc.

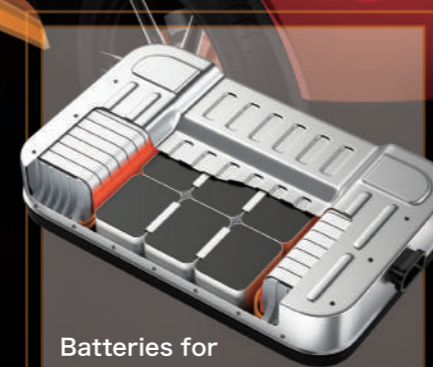
- Lack of bonding strength
- Lack of heat resistance
- Lack of long-term reliability



### Metallurgical Joining

- Welding, etc.

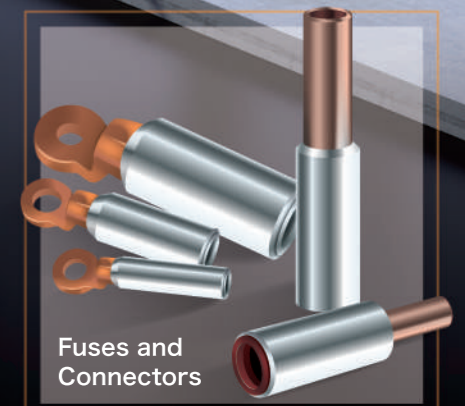
- Deformaty and softening due to heat
- Danger from sparks and spatter during operation
- Embrittlement due to generation of intermetallic compounds



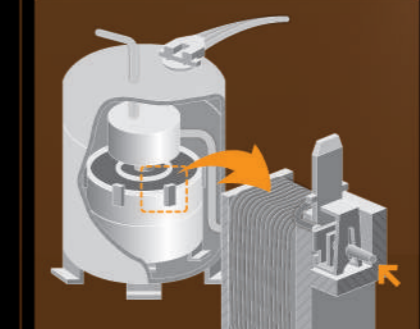
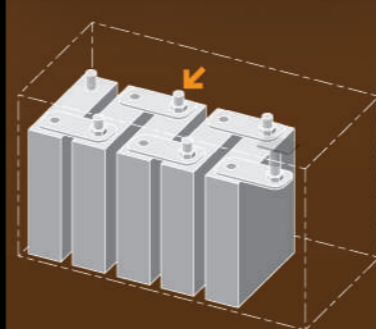
Batteries for Electric Vehicles



Compressors for Appliances



Fuses and Connectors



Great potential for metal-joining technology in various fields and industries.



**AKROSE™**  
The Joining of Dissimilar Materials  
**Features**

Allows for the joining of various materials

**01**  
POINT

Allows for the joining of multiple materials

**02**  
POINT

Allows for the joining of complex joint shapes

**03**  
POINT

Provides tighter adhesion

**04**  
POINT

Provides higher resistance to rotation at seam

**05**  
POINT

Allows for reduction of environmental impact

**06**  
POINT