# FastenerClass® Course Guide

**Explore our free classes in fastener technology.**
**Learn from the experts and overcome your design challenges.**

PEM®

www.pemnet.com

**FastenerClass® is a series of in-depth courses covering all aspects of fastening technology. Free for engineers in all industries, FastenerClass® courses help you enhance your knowledge of fastening technology so you can confidently select the right fastening solution for your needs every time.**

Get expert guidance from our in-house team of experienced engineers and discover ways of improving your product designs and performance.

With a rich history spanning over 80 years and a host of strategic locations across the globe, PEM® engineers support customers in all industries. PEMedge® comprehensive product testing and teardown services complement our FastenerClass® courses, which you can call upon for expert guidance on optimising your products and overcoming unique design challenges.

# Contents


**Intro to Self Clinch Theory** 4

Catalogue Training 101 5

Fasteners for Compact Electronics 6

Surface Mount Technology (SMT) vs. Broach 7

Fasteners for Stainless Steel Panels 8

Captive Panel Fasteners 9

Self Clinching Locknuts 10

Sheet-to-Sheet Attachment 11

Innovative Solutions for Design 12

Fasteners for Magnesium and Aluminium Castings 13

Blind Threaded Rivets 14

Threaded Inserts for Plastics (SI®) 15

Self Clinching vs. Weld 16

**Introducing Your PEMedge® Course Leader** 17

**Learning Outcomes (Conclusion)** 18

**Register for FastenerClass®** 19


# Intro to Self Clinch Theory

## Course Overview

Self clinching fasteners offer a smart alternative to conventional joining methods, such as welding or adhesives.

In this course, our expert will guide you through the many benefits of self clinching fastening technology.

Hear directly from PEM® experts how leveraging this technology can help you improve your designs, minimise costs and maximise product performance.

## Applications/Industries

Self clinching fastener technology offers a host of benefits for applications across several industries, including:

- Automotive Electronics
- Consumer Electronics
- EV and Charging
- Datacom and Telecom
- Medical
- Aerospace and Defence Electronics
- Sheet Metal and Metal Enclosures

Self clinching fasteners become a permanent part of the item into which they're installed, whether a panel, chassis or bracket. It's important to understand the fundamentals of this technology to identify appropriate use cases.

## Learning Objectives and Outcomes

- ✓ Understand self clinch theory and how self clinching technology works
- ✓ Learn the key requirements for self clinching technology
- ✓ Gather important dos and don'ts for self clinching applications
- ✓ Get guidance on performance testing and establishing trust in self clinching products


# Catalogue Training 101

## Course Overview

In this course, our expert will guide you through some of the most popular PEM® products used in your industry, outlining potential use cases and demonstrating where they can be implemented to boost efficiencies and improve product performance.

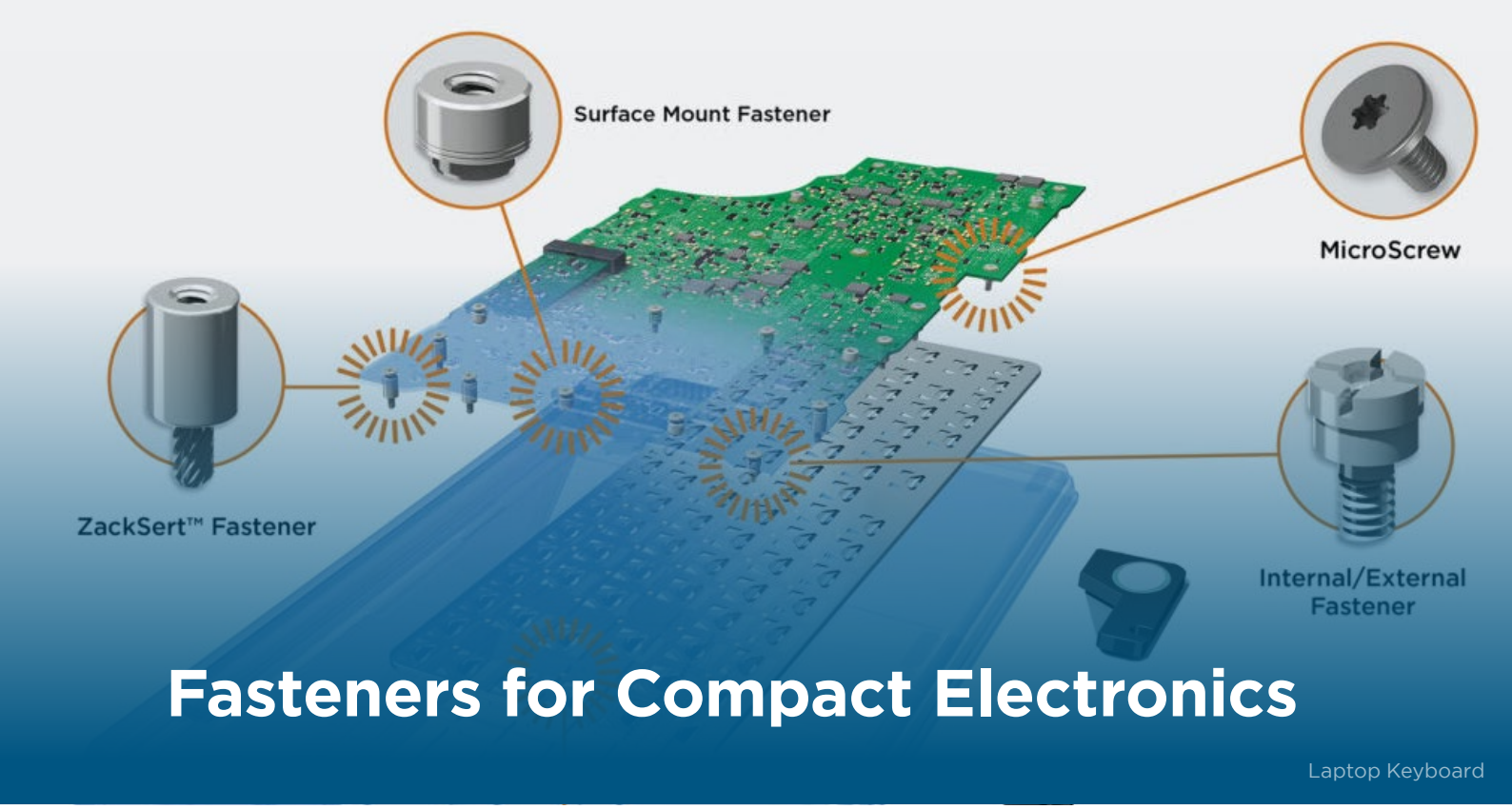
## Applications/Industries

The PEM® catalogue features high-quality, reliable fastening solutions that can improve designs in the following industries:

- Automotive Electronics
- Consumer Electronics
- EV and Charging
- Datacom and Telecom
- Medical
- Aerospace and Defence Electronics
- Sheet Metal and Metal Enclosures

## Learning Objectives and Outcomes

- ✓ Understand what self clinching fasteners are and how they work
- ✓ Discover the fastening solutions available as part of the PEM® range and understand their benefits and individual use cases




# Fasteners for Compact Electronics

Laptop Keyboard

## Course Overview

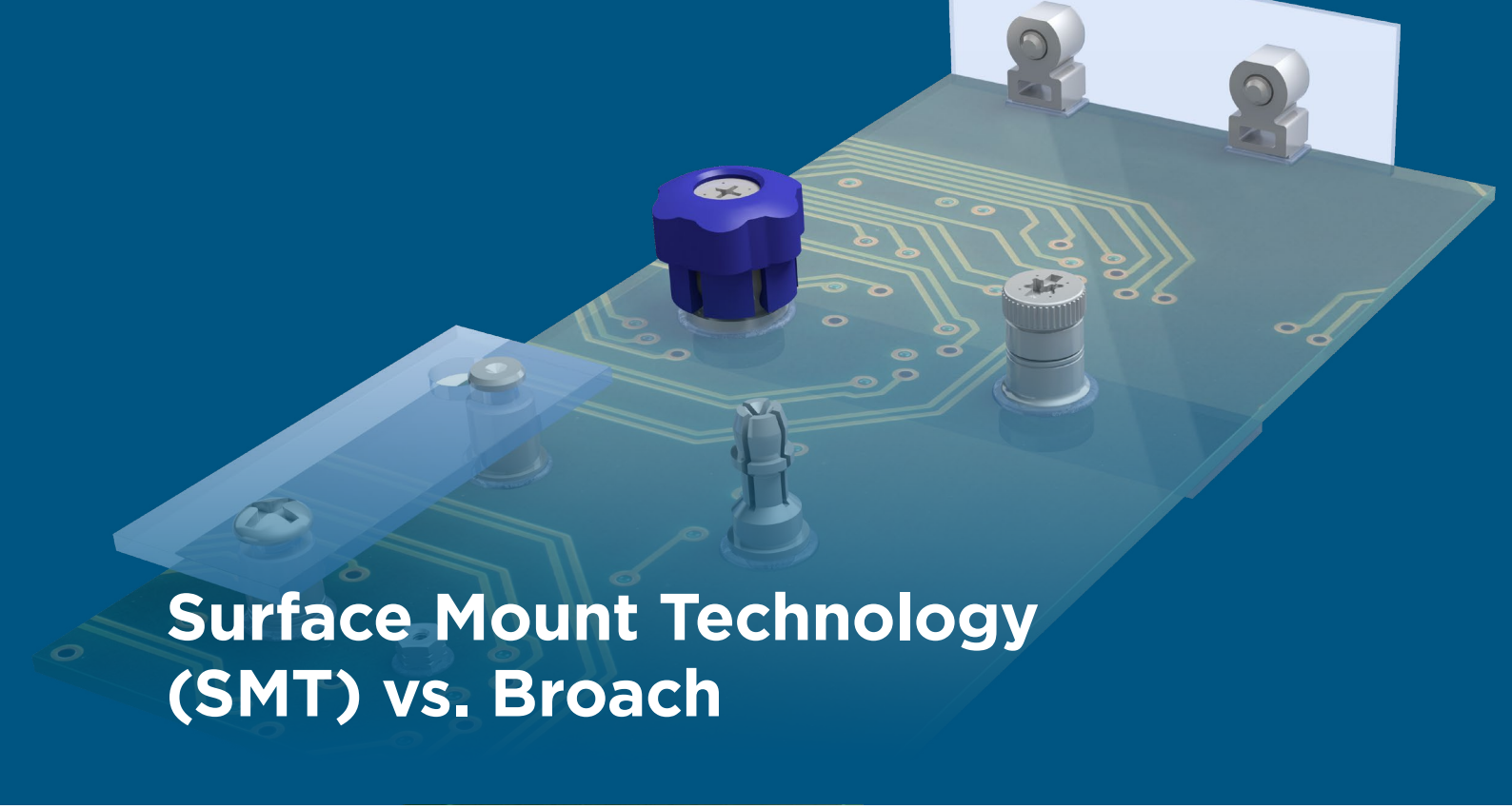
In this course, you'll learn how to **reduce the size and weight of your designs** while also reducing cost. You'll also learn how you can improve the quality of your product by replacing traditional hardware with microPEM® fastening solutions.

## Applications/Industries

The microPEM® range provides fastening solutions that design engineers can leverage to minimise footprint and reduce z-height in compact electronics, thereby enabling smaller, lighter and more cost-effective designs.

## Learning Objectives and Outcomes

- ✓ Learn more about microPEM® and the design needs this product line answers
- ✓ Understand how microPEM® solutions can replace loose screws for permanent assemblies
- ✓ Explore the microPEM® range and find the best fastening solution for your design



# Surface Mount Technology (SMT) vs. Broach

## Course Overview

In this course, our expert will guide you through the use cases and advantages of surface-mount technology compared to broaching fasteners. You'll learn how SMT works, how SMT products are installed and how these products can reduce scrap, handling and the total installed cost for your applications.

## Applications/Industries

SMT can be used to **optimise PCB production processes** and product performance in several industries, including consumer electronics, automotive electronics, datacom and telecom.

## Learning Objectives and Outcomes

- ✓ Understand the reflow solder process in greater depth
- ✓ Explore the benefits and potential applications for PEM® ReelFast® fastening solutions

# Fasteners for Stainless Steel Panels

## Course Overview

In this course, our expert will discuss how and why self clinching fastening technology is a viable alternative to conventional joining methods in stainless steel applications. We'll then outline some essential dos and don'ts to remember when selecting and installing a self clinching fastener, before exploring the various options available in the PEM® product catalogue.

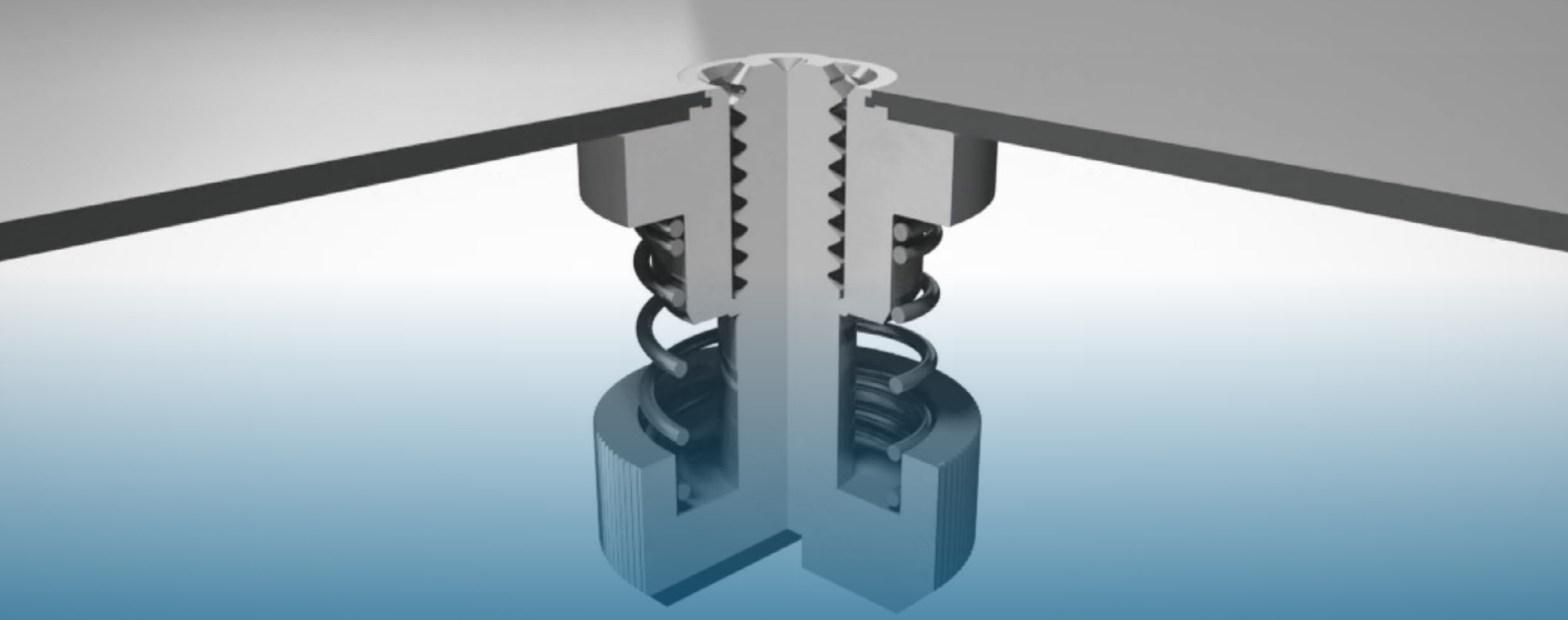
## Applications/Industries

The knowledge gained in this course can be valuable to design engineers working across several industries, including:

- Industrial and Commercial
- Datacom and Telecom
- Medical
- Consumer Electronics
- Aerospace & Defence Electronics

## Learning Objectives and Outcomes

- ✓ Learn the key factors to consider when choosing the right fastener for installation into a stainless steel panel
- ✓ Uncover the benefits and various use cases for self clinching fastener technology
- ✓ Understand why panel hardness is an important factor for proper assembly
- ✓ Further your understanding of the potential applications of self clinching fasteners in stainless steel sheet metal with real-world examples from various industries



# Captive Panel Fasteners

## Course Overview

PEM® captive panel fasteners help keep parts to a minimum and eliminate the risks associated with loose hardware in a component.

These panel fasteners are an ideal solution for attaching metal panels or other thin material components in applications where frequent access to the fitting will be required.

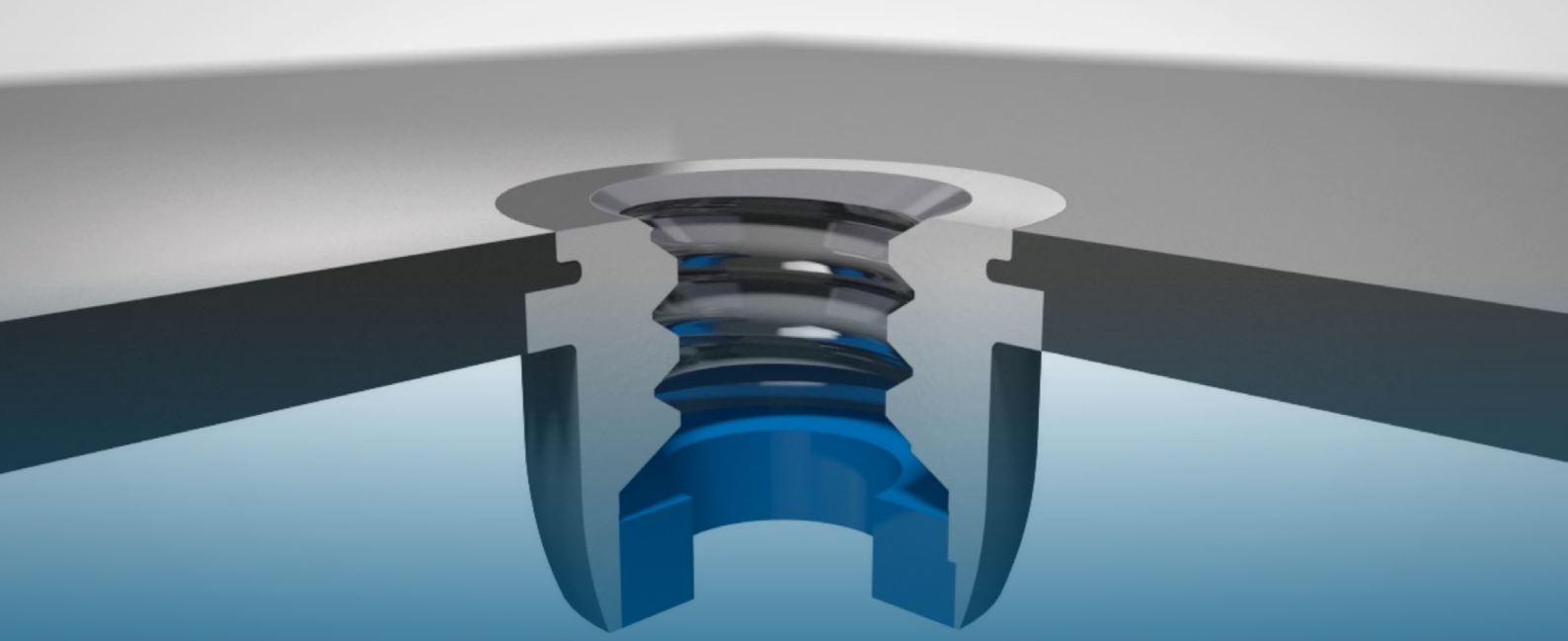
In this course, you'll learn about the types of captive panel fasteners available in the PEM® product range. You'll also receive expert guidance on choosing the right type of fasteners to meet your specific design requirements.

## Applications/Industries

- Datacom and Telecom
- Medical
- Industrial and Commercial

## Learning Objectives and Outcomes

- ✓ Learn more about the different types of panel fasteners available in the PEM® range, including SMT captive panel fasteners
- ✓ Uncover new design opportunities and further your understanding of this technology with real-world application examples



# Self Clinching Locknuts

## Course Overview

Vibrational loosening is a common concern for design engineers working across various industries and applications. One potential solution is finding a suitable locknut variation to prevent mating hardware from becoming loose in service.

In this course, we'll discuss the different locknuts available as part of the PEM® range. Our expert will guide you through the two main locking design features – **prevailing torque and free-running thread** – outlining the benefits of each so you can confidently select the right locknut for your needs.

## Applications/Industries

Industrial and Commercial

Datacom and Telecom

## Learning Objectives and Outcomes

- Discover the range of PEM® self clinching locknuts available
- Understand how the features of the two main locking designs work
- Receive expert guidance on how to select the right locknut for your design requirements
- Explore the various use cases for self clinching locknuts with several real-world application examples

# Sheet-to-Sheet Attachment

## Course Overview

In this course, you'll uncover all the benefits of self clinching fastening technology and learn how to choose the suitable fastener for your sheet-to-sheet attachment.

Understand how self clinching fasteners work and find out how this technology can replace welds and adhesives to provide a flush sheet-to-sheet joining method that is stronger, quicker, cleaner and more cost-effective.

## Applications/Industries

- Automotive Electronics
- Consumer Electronics
- EV and Charging
- Datacom and Telecom
- Medical
- Aerospace and Defence Electronics
- Sheet Metal and Metal Enclosures

## Learning Objectives and Outcomes

- ✓ Understand the benefits of self clinching fastener technology in sheet-to-sheet metal applications
- ✓ Explore the PEM® range of self clinching fasteners suitable for sheet-to-sheet fastening and learn the key factors to consider when selecting the right solution for your needs


# Innovative Solutions for Design

## Course Overview

Fasteners are used across various industries in place of welding or adhesives, with each type of fastener bringing unique capabilities, uses and benefits to the design engineer.

In this course, we'll explore the unique PEM® fastening technologies you can leverage to improve product design and performance.

## Applications/Industries

Our unique PEM® fastening solutions have been used to combat design challenges in various applications across all industries, including:

- Automotive Electronics
- Consumer Electronics
- EV and Charging
- Datacom and Telecom
- Medical
- Aerospace and Defence Electronics
- Sheet Metal and Metal Enclosures

## Learning Objectives and Outcomes

- ✓ Explore the innovative PEM® fastening solutions that can solve your unique design challenges


# Fasteners for Magnesium and Aluminium Castings

## Course Overview

In this course, you'll learn about the resurgence of magnesium and cast aluminiums in industries such as automotive and consumer electronics.

Our expert will guide you through the different types of fasteners that may be appropriate for your design, along with their installation processes, including internally and externally threaded fasteners, captive panel screws and other fastening alternatives.

## Applications/Industries

Automotive Electronics

Consumer Electronics

## Learning Objectives and Outcomes

- Learn about the importance of selecting the right type of fasteners for your magnesium or aluminium cast design
- Explore the different types of fasteners that are appropriate for use in magnesium and aluminium castings
- Understand the advantages and disadvantages of these fastener types and learn how they're installed

# Blind Threaded Rivets (ATLAS®)

## Course Overview

In this course, you'll learn how blind threaded rivet nuts are the best choice for certain product designs. Our expert will discuss this technology's benefits, use cases and installation methods.

## Applications/Industries

- Industrial and Commercial
- Automotive Electronics
- Datacom and Telecom

## Learning Objectives and Outcomes

- ✓ Understand the benefits and use cases of blind threaded rivet nuts
- ✓ Get expert guidance on how to select the right installation tool for the job
- ✓ Explore the solutions available in the ATLAS® range

# Threaded Inserts for Plastics (SI®)

## Course Overview

Learn how threaded inserts and compression limiters can help achieve strong and reusable permanent threads in plastics.

In this course, you'll develop an understanding of threaded inserts – what they are, why they're used and how they're installed. You'll explore the SI® range of flanged inserts and compression limiters with real-world examples and use cases.

## Applications/Industries

- Industrial and Commercial
- Datacom and Telecom
- Automotive Electronics
- Consumer Electronics
- EV and Charging
- Medical

## Learning Objectives and Outcomes

- ✓ Understand what threaded inserts are and why they're used
- ✓ Develop a critical understanding of the installation methods used to implement these solutions
- ✓ Access expert insight and solutions for overcoming common design challenges and technical issues

# Self Clinching vs. Weld

## Course Overview

In this course, our expert will discuss why self clinching fasteners are a smarter way to achieve flexible designs, cleaner installation, stronger threads and reduced costs.

We'll cover the basics of self clinching theory before exploring the various benefits this technology offers compared to conventional weld fasteners.

Through a combination of theory and real-world application examples, you'll develop an understanding of how self clinching fasteners work and the installation process behind them.

You'll also learn how to leverage the full suite of PEMedge® services, including full application engineering support and guidance, to assist in transitioning from welding to self clinching technology.

## Applications/Industries

- Automotive Electronics
- Consumer Electronics
- EV and Charging
- Datacom and Telecom
- Medical
- Aerospace and Defence Electronics
- Sheet Metal and Metal Enclosures

## Learning Objectives and Outcomes

- ✓ Understand the basics of self clinching theory
- ✓ Explore the benefits self clinching offers compared to weld fasteners
- ✓ Get insight into how this technology can be used with real-world examples

# Introducing Your FastenerClass® Course Leader

## Jay McKenna

Global Technical Marketing Manager

### Industry Experience

With a background in applications engineering, Jay has been part of the PEM® team for over 25 years and enjoys sharing his passion and expertise with engineers in all industries.

### Specialist Areas

Self Clinch Theory, PEM® Catalogue Training, Compact Electronics, Surface Mount Technology vs. Broach, Fasteners for Stainless Steel Panels, Captive Panel Fasteners, Self Clinching Locknuts, Sheet-to-Sheet Attachment, Fastener Design Innovations, Fasteners for Mg and Al Castings, Self Clinching vs. Weld

# Learning Outcomes

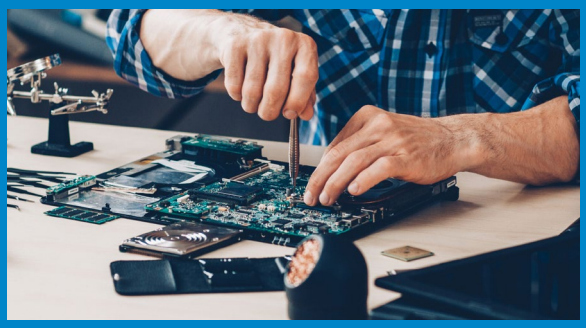
Our FastenerClass® series equips engineers with the knowledge, skills and ability to improve their designs, reduce costs, optimise product performance and make production processes more efficient.

When paired with our complementary suite of PEMedge® services, FastenerClass® can help uncover new design opportunities within your field and improve the products you'll be taking to market.

## Access the Full Suite of PEMedge® Services

### PEMedge® Application Engineering

Access our prototype development centre, assess your design and develop your product alongside our in-house team of expert engineers.



### PEMedge® Teardown

Get in-depth analysis and expert guidance on improving your product costs and performance with a complete product teardown carried out by the PEM® experts.

### PEMedge® Testing

Leverage PEMedge® comprehensive analytical testing to deliver safety compliance, consistent quality and optimal performance for your products.

# Enhance Your Skills and Expand Your Fastener Knowledge with FastenerClass®

Ready to take the next step in your development?
Gain confidence in the design process and start optimising your products today with key learnings from PEM® experts.

**REGISTER FOR FASTENERCLASS®**

PEM®

www.pemnet.com