

## WÜRTH FASTENER ACADEMY

Würth created the “Fastener Academy” classes based on questions and discussions encountered with engineering teams on a regular basis. After launching this initiative to our customer base in November of 2012, over 1500 attendees, largely engineers, have gained a much better understanding of the basics of fastener assembly design and they’re asking for more. Below is a brief description of each module in the two primary training programs offered today.

### **FASTENER APPLICATION & SPECIFICATIONS:**

- **Manufacturing Process** – In this opening segment we learn about the different processes to produce most fasteners. What are the cost drivers, capabilities and limitations of each method? We have found it’s important to understand the fundamentals of manufacturing first as we refer back to this understanding to build upon the mechanical effects caused during the process.
- **Industry Standards**- There are many industry consensus standards governing fasteners. Who are these organizations, what are the differences among them, Can you substitute one for the other?
- **Basic Terms and Drawings** – Close to 25% of all fastener drawings do not properly identify the component required. This causes costly supply mistakes, assembly error’s and quality concerns. In this module we examine some dos and don’ts of fastener drawing basics.
- **Fastener Materials and Mechanical Properties** – Here we discuss how to specify fastener materials without falling into the “specials” category unnecessarily. Mechanical terms are also defined and explanation given as to their use in application.
- **Torque Tension** – Torque is simply a rotational force to overcome friction. How does that equate to tension in an assembly? Here we walk through the basic fundamentals of bolted joint design and achieving the final objective of joint clamp load.
- **Threads** – First we explore the differences between cut and rolled threads then move into providing a better understanding of the different thread classes and tolerances, how coating thickness affects the thread fit, and how metric threads are defined.
- **Thread Inspection** – The basics of thread inspection are covered in this module along with allowances for nicked threads and coating thickness

### CORROSION & FASTENER FINISHES:

- **Corrosion** – We start with an understanding of corrosion including, Galvanic Corrosion, Surface Corrosion, and Stress Corrosion Cracking
- **Phosphate** – This is a widely used coating. How does it protect metals and what are its many uses?
- **Black Oxide** – A good fastener coating to achieve a black aesthetic appearance without adding dimensionally to the metal surface.
- **Electroplating** – The most common of all fastener finishes. In this module we address environmental concerns and the challenges ahead with corrosion protection.
- **Hydrogen Embrittlement** – Internal Hydrogen Embrittlement is explained in laymen’s terms. How do you prevent this extremely costly and catastrophic event from happening in your assembly?
- **Dip Spin/Spray Coatings** – In this module we explore fastener coatings via the dip/spin process. These are high corrosion resistant coatings which bring many advantages and some challenges.
- **Electrocoat “E-Coat”** – Bulk process of applying paint as the fastener finish. This is a high decorative black finish.
- **Mechanical Plating/Galvanizing** – This fastener finish is gaining popularity as a replacement for electroplating and hot dip galvanized for high tensile parts.
- **Electroless Nickel** – Do you need a hard surface finish for wear resistance? This may be the answer.
- **Hot Dip Galvanized** – Dependable high corrosion resistant coating used in outdoor applications. What are the advantages and challenges with this durable fastener finish?

The Fastener Academy class is typically 5 hours with lunch included. An engineer at a recently conducted class commented *“The Würth Fastener Academy training is equivalent to a college course in Fastener Technology!”*. On another occasion an engineer wrote to his assigned Würth engineer *“One thing that struck me in Randy’s presentation is how much of that stuff you’ve taught me over the years. Imagine how much time you could save if you just put new customers through that course first...”*