



Fort Wayne ENGINEERS', Club

Engineers' News

January 2025

Vol. 87 No. 4

www.FortWayneEngineersClub.org

January Tour



When: Jan. 30th, 2025 @ 6:00 p.m.

Where: 2501 E Coliseum Blvd., Fort Wayne IN 46805

Details: PBS FW is a free educational, cultural, and civic broadcast service, available to any home or classroom, regardless of income, education, gender, ethnic background, or age.

For every dollar of federal funding received, PBS FW raises nearly three additional dollars locally, providing a 265% return on the federal investment for a most successful and effective public-private partnership.

For nearly 50 years, PBS FW has been the only public television station in northeast Indiana and is today the only locally owned and operated full power (350 kW) television service in the region. PBS FW aligns its mission with programming over five channels:

- PBS Fort Wayne (39-1), our main channel
- PBS FW Kids (39-2), a 24-hour free service dedicated to quality, non-commercial, educational children's programming.

- PBS FW Create (39-3) offers a national schedule of "How To..." and travel programs.
- PBS FW Explore (39-4) airs local and Indiana-centric programs, international news, public affairs, and the best of PBS.
- PBS FW WX (39.5) provides 24/7 near real-time National Weather Service Doppler radar, weather alerts and NWS audio.

<https://www.pbsfortwayne.org/>

November Tour Summary



C&A Tool has over 600 employees and 650,000 square feet distributed between Churubusco, Auburn, and Columbia City. Each location has specialties to some extent. Collectively, the locations hold what can be reasonably described as a fistful of certifications (ISO, etc.) pertaining to medical, aeronautic, food, and other disciplines. Services range from mass production to prototype assistance. Tolerances for either can be within a micron if needed.

The business started with the original owner working out of his garage in Churubusco. He tended to cautiously buy shop equipment with improved or novel capabilities, believing that demand would follow. It appears there was also respect and high expectations for employees. Fairly steady diversification and growth resulted. Upon retirement, he carefully selected who to sell out to. MinebeaMitsumi Group effectively continued the business philosophies. There was a

very warm sense of homecoming between our manager-hosts and FWEC members on this tour who were former employees.



This sizable Auburn facility was built with substantial extra capacity, which has rapidly been put to use. Much of it is tooling and finishing for bone implants and related surgical implements. The metals tend to be titanium, cobalt-nickel alloys, and stainless steel alloys. Initial starting materials range from 10 foot-long rods to laser-sintered 3D printed implants. Body tissues tend to grow into and integrate with titanium, but not cobalt alloys. Sintered 3D-printed parts can vary in porosity and therefore tendency of patient tissue to grow into a part. Titanium encourages integration. Cobalt alloys discourage integration and may be chosen so an implant can be later removed or updated, such as for the skeleton of a growing child. The potential difference in density (i.e., “weight” and balance) of titanium versus cobalt components seemed at least an order of magnitude.

Printed parts must be freed from their extraneous handling extensions. Then, some surfaces may require one or more stages of smoothing or polishing, for instance to allow smooth body movement. Other surfaces may be roughened for handling or for rasping down for proper fit within a patient’s skeleton. Thicknesses may have tolerances in single-digit microns. Then, rigorous cleaning may be needed inside and out.

Some 3D parts are derived from casts of a specific patient. Our tour specifically studied all or partial replacement of custom-formed scapulas.



We handled and discussed the contents of display cases with over two decades of evolving materials and concepts produced at the Auburn facility. Coatings that encouraged integration with surrounding body tissue have been replaced with porous sintered titanium or other concepts. Deteriorated or shattered bones, such as vertebra or long bones, can now be replaced with adjustable parts that fit better initially and perhaps can “grow” with a patient. Ranges of artificial joint movement have also steadily increased. An intriguing full-range cervical (neck) implant is now available.

Bone screws tend to be formed elsewhere and then adapted at Auburn for an amazing range of specialty needs. These typically require finishing, cleaning, and often fusion with heads of a different metal. For instance, design and metal content of the head determines whether the screw can be removed later. Production and fusing of heads is complex, performed at the Auburn facility.

Matching surgical drills and bits are usually needed to predrill and then thread healthy bone. As with the screws, these often combine different metals which must be properly aligned during manufacture so an entire assembly rotates without wobble.

Engineers Club tours relentlessly highlight that continuous improvement, quality control, and exploration are required for business survival in modern times. C&A Tool's philosophy of cautiously exploring improved or novel capabilities led to an astonishing ability to document and control one-micron variations. Computed tomography (CT scanning) uses x-rays to effectively produce topographic maps of outside and inside surfaces of a target, including individual parts of an assembly. Internal pores, gaps, and other density changes are evident in detail. Literally, one can see surface undulations in a slice through a part, and/or hollows in the underlying matrix. Other depictions can use colors to highlight high and low spots on a part, or out-of-round variations in a drilled hole.

CT resolution is limited primarily by how much time is available to scan a target (can be seconds to hours) and how much computing capacity is available (such as data storage and software speed). We saw results depicted in three seconds using onsite data storage (terabytes). We gave up after 20 minutes when attempting to use offsite storage. Our tour host and subsequent sources suggest intervening security softwares (such as "firewalls") are one of several factors which hamper use of offsite data storage (generically referred to as the "cloud").

Much of the production is packaged at this facility for subsequent sale. Items destined for foreign markets are usually packaged as complete color-coded sets and sent to a specialized vendor in the U.S. for sterilization prior to sale. Some of the sterile sets are sold domestically for emergency circumstances. Hospital systems within the U.S. are usually equipped to properly handle, select, and sterilize individual pieces. Laser etched identification of individual parts is not unusual.

We toured "just" some medical prototype and mass production capabilities at C&A Tool. They do much more. Our sincere thanks for a tour that left some of us stunned.

Interested in Hosting a Tour?

Contact us today!

Host a Tour

Items of Note

FWEC member Rod Vargo is Chair of the 30 year-old and all-volunteer [Utility Advisory Group](#), which formally advises Fort Wayne City Utilities and often City Council. Your comments are welcome at rodvargo@comcast.net

General Club Info

Fort Wayne Engineers Club dues are \$0. Donations are welcome but strictly voluntary. In recent years, club funds have helped support Discover-E, the Regional Science and Engineering Fair, annual bridge building contests in schools, academic awards, networking events, mentoring, our website, and facilitating free tours.

Please see FortWayneEngineersClub.org for updates on current Club activities, other news, and past newsletters.

Those participating in activities or hosting tours through FWEC do so strictly at their own risk, including disease exposures. Participation in club events is voluntary, free, nonprofit, and solely for the benefit of participants and the community at large. Anyone with an interest may participate unless restrictions are specified for specific events, such as minimum age or minimum safety attire.

FWEC Roster for FY2024-2025

President: Nathaniel Wisel

Vice President: Mindy Robinson

Secretary: Rod Vargo

Treasurer: John Magsam

First-year Board Members: Marna Renteria, Mike Magsam

Second-year Board Member: Dave Gordon, Bert Spellman

Third-year Board Member: Ryan Stark, *Open*

Editor of Engineer News: Nathaniel Wisel

Membership and Contact Chair: *Open*

Northeast Indiana DiscoverE Chair: *Open*

Job Posting and Resumes Listed

The club accepts both job openings from around the area, as well as resumes from those seeking employment. Please submit these to the following email address:

Info@FortWayneEngineersClub.org

Advertise in the Engineers' News

The FWEC provides advertising space within the Engineers' News. Advertisements are only \$10 per issue and limited to ½ page of content.

Advertise Your Business

Copyright © 2025 Fort Wayne Engineers Club, All rights reserved.
You are currently subscribed to this Newsletter

Our mailing address is:
Fort Wayne Engineers Club
8421 Fantasia Way
Fort Wayne, IN 46815

[Add us to your address book](#)

[unsubscribe from this list](#) [update subscription preferences](#)

