Fort Wayne ENGINEERS' Club

Engineers' News **March 2023** **Vol. 85 No. 6**

www.FortWayneEngineersClub.org

March Tour

When: Thursday, March 16th @ 6:00 PM
Address: 8350 N 500 W, Decatur IN 46733
Website: (no website)
Info: Farming has transitioned over the past 50 years from the 80-acre family farm to 1500-acre (or more) farm operations. Most of these operations are still family owned but are run more like other businesses in the country instead of what most think of as family farms. This transition has been led by the increase in mechanization and more recently by software-controlled systems. These changes have increased the labor efficiency on farms to the point that a small number of laborers can now out-produce an entire community of earlier farmers. Yields have seen a steady increase driven by improvements in seed, fertilizers, pesticides, and tillage practices. While the time required to process has decreased with larger and more powerful equipment augmented by software and electronics. Join the Fort Wayne Engineer's Club at Kiefer Family Farms for a discussion of these trends and a review of the equipment

utilized in modern farming.

*This is a private farm that has welcomed us to visit. As always please respect the property and equipment. Dress accordingly. Most of the presentation will be indoors but there could be some outdoor exposure.

February Tour Summary

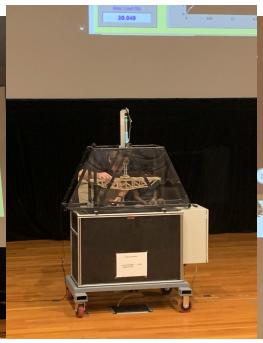
Seventeen members attended another Reelcraft Industries tour in Columbia City despite a cold February rain. Reelcraft designs and manufactures over a thousand versions of special purpose hose and cable reels distributed essentially worldwide. The quality ranges from potentially a lifetime of service in homes, to handling virtually any fluid at pressures up to 5000 psi in uses as severe as off-road fire trucks or aircraft carriers. We saw hose diameters up to 8 inches, in this instance for ducting diesel exhaust from facilities. Metric and English units of measurement were used, depending on circumstances. Reelcraft has been producing volumes of heavy duty commercial reels since the 1960's and has an active refurbishing business.

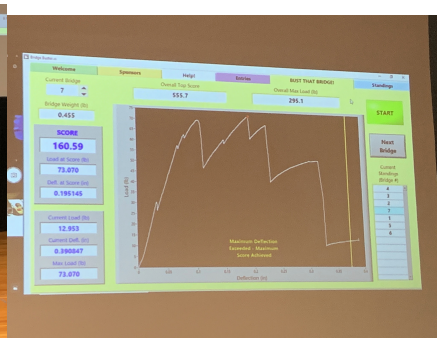
Their facilities occupy 80,000 square feet and employ about 400 people in two shifts. An excellent video tour of this complex business is available at “Abom79 - YouTube”. Reelcraft.com provides videos on specific product groups and their stunning range of uses.

To read more, click here

Bridge Building Contest

The Northeast Indiana Engineers’ Week Model Bridge Building Contest was held on Saturday February 25 in the Neff Hall auditorium on the campus of Purdue Fort Wayne. There were two divisions: middle school and high school. The competition was based on the total weight of the bridge and how much weight a bridge could support before it reached a total deflection of 3/8”. Each bridge was placed in a custom testing apparatus and a hydraulic ram was used to apply force and measure the deflection. The judging was stopped once the bridge reached the total deflection, and if it didn’t completely break during testing, the students could decide if they wanted to continue until the bridge was totally destroyed. This was my first time attending the contest (my son was a contestant) and I was truly impressed by the different array of bridges that were tested, the testing apparatus used to judge the competition, as well as the pace at which they moved through the many different competitors (mostly teams of students). The winning bridge supported a total of 1,296.634 lbs. It had only deflected 0.367 inches before it succumbed to the pressure. Its total weight was just 0.629 lbs. Not bad for popsicle sticks and wood glue. Many thanks to the sponsors: Engineering Resources, Purdue Fort Wayne, Adaptec Solutions, R.L. McCoy Inc., Almet Inc, and your own Fort Wayne Engineers’ Club.





To read more, click here

Items of Note

FWEC member Rod Vargo is Chair of the 28 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

Volunteer Positions within the Club

Membership and Contact Chair: Open
Northeast Indiana DiscoverE Chair: Open

Vice President:
Club Vice President needed! It's time once again to ask club members to fill this vital spot in the club's leadership roster next year. The Vice President is generally in charge of arranging club tours, though this has traditionally been a team effort so it's not really all that much work. You would be expected to attend the monthly officers meeting (from the end of August until the end of May) and at the end of your one-year term, you would automatically become club president. The typical monthly time involved would be roughly 2 hours (including attending the officers meeting). If you enjoy the club and would like to see it continue to function, please consider volunteering for this spot.

Let us know if you're interested!

Volunteer

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, LinkedIn, or Facebook 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.

Interested in hosting a tour?

Contact us today!

Host a Tour

FWEC Roster for FY2022-2023

President: Nate Berndt
Vice President: Nathaniel Wisel
Secretary: Marna Renteria
Treasurer: John Magsam
First-year Board Members: Ryan Stark, Ed Woodward
Second-year Board Member: Mike Magsam, Rod Vargo
Third-year Board Member: Dave Gordon, Bert Spellman
Editor of Engineer News: Pending
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

February Tour Summary Continued

Custom-made reels are available, but the manufacturing floors are oriented to rapidly producing masses of parts and assembling them with genuinely superb ISO-certified precision. An automated laser cuts and/or etches initial pieces, loading itself from up to a pallet load of flat sheet metals. Other pieces are derived from various coils of metal feedstock. A considerable range of stamping machines, up to 500 tons of force, further cut and bend parts. Minimal scrap metal is generated. Minimal hand-finishing and/or welding are needed because these labor intensive and unpopular steps have been explicitly designed out over time. Most pieces are cleaned, powder coated, and baked in an extensive series of enclosed spaces fed by an overhead chain conveyor. Hose fittings and clamps are manufactured on site or procured, and durably attached to appropriate lengths of various hose types. The parts come together as needed in generic assembly areas, each area rapidly reconfigured as needed according to meticulously organized info on computer screens. Quality testing is done on every unit in various steps of manufacture and assembly. Then product, packaging, and related materials meet at the end of an assembly area based on similar operating procedures.

Workers appeared to take pride in the facility's flow and detail. Our tour group included two former engineers, who were obviously glad to be revisiting. Our tour host had returned to Reelcraft after a stint elsewhere. He outlined a longstanding corporate commitment to training, retention, and steady improvement in work experiences. Discussions throughout the tour of decade-long cost control and competitive marketplace pressure almost always included improved circumstances and pay.

Much of the tour revealed broad based continuous improvement. We had considerable engineering discussions regarding durability versus weight. Bends, indents, bevels, or rolls in metal work evolve from design experience and ongoing efforts to reduce weight and materials while retaining or improving strength. They introduced a few heavy nylon-based products for some less demanding applications, which are much lighter and less costly but not as durable as metal for most applications. A base (pedestal) or other mount might support the reel at just one

end, or both ends. The reel might or might not be enclosed, for instance to protect the hose on the back of a truck from sunlight deterioration or grime. An expensive detail is countersinking of fasteners, where fasteners are still used, to presumably eliminate wear points, potential snags, and facilitate cleaning. (Fabricating some reels in stainless steel suggested considerable use in food processing and preparation facilities.)

The stamping machines (mechanical presses) are managed and potentially replaced to meet changing products, safety requirements, and economics. Reelcraft repairs and sharpens most of its own dies and has extensive racks of them. Reconfiguring them for different products would be more time consuming but follow computerized guidelines analogous to those for the assembly areas.

ISO standards and active continuous improvement are evident throughout the facilities. We were not allowed to see much regarding military uses, but additional rigorous quality was evident in what we did see.

“Hose” applications commonly include heavy-duty multiple-outlet electrical cables, fuels, lubricants, air, welding hose or cord, fire-fighting, suction (such as sewer cleaning), and fume exhausts. Mountings may include boom truck assemblies.

A spindle, or hub, for conveying fluids (instead of just electricity) can be formed in various ways but is usually cast metal. It may carry two separate fluid channels, such as for oxyacetylene welding reels. Spindle engineering was widely discussed and continues decades-long complex improvements for durability, changing requirements, and attempts to utilize outside contractors. The swivel joint in these products must not leak for thousands of cycles of use.

The hose is typically retracted back onto the reel by a helical spring with or without ratcheting mechanism. Alternatives include a hand crank, sometimes an electric motor, and occasionally other means. The springs are both an art and science that Reelcraft handles in-house, except perhaps specific treatment(s) of the spring metal. Spring tension is set at the same time that Reelcraft loads a hose onto the reel. Even lubrication needs to be just right, and the unit sealed from dust and moisture. Customers should not lubricate helical springs unless instructed otherwise, for functional reasons and because accessing them can be extremely dangerous.

Some nationalities expect a ratcheting mechanism to click or provide specific tactile cues when it releases to pull a hose back onto the reel. Others expect it to be silent or nearly so. Others are annoyed by ratchets. Tension expectations can vary with customer. Unless carefully designed otherwise, tension on a hose varies by how far it is extended and can sometimes pull people off balance.

Our sincere thanks to Reelcraft Industries and Senior Design Engineer Mike Papaik

for a throughly productive tour. Perhaps the most impressive aspects for this writer were obvious decades of improvement, durability, and concern for workers.