



C.F. Roark Welding & Engineering Co., Inc.

***Complex Metal Fabrication &
Electron Beam Welding***

ILC Workshop 2021



Custom manufacturer of complex fabrications and provider of electron beam weld services

www.roarkfab.com www.ebwelding.com

Who we are.....



70,000 square foot facility on 14 acre campus

Business

- Founded 1949, Family owned for 72 years
 - 4th generation in metalworking
- Employment level – 90
- Cage Code: 00518

Our Objectives

- 100% Customer Satisfaction
- 95% or greater on-time (Production) deliveries
- Continuing Improvement
 - Lean initiatives
 - AS9100/ISO9001 awareness for all personnel
 - Scrap – 2% or less
 - Rework - 3.5% or less

Accreditations

- ISO9001:2008, AS9100-B
- Welding, NDT, Heat Treating, Nonconventional Machining and Chemical Processing
- FAA Repair Station: YWER845L



Our Customers

Markets Served

- **Aerospace**
 - Engine, Gas Turbine
 - Missile
- **Defense**
 - Marine
- **Energy**
 - Power Generation
- **Transportation**
 - EBW support
- **Science**
 - SRF - Niobium Fabrication
 - SRF - He Vessel Fabrication
 - EBW support



Raytheon



Our Capability

Processes

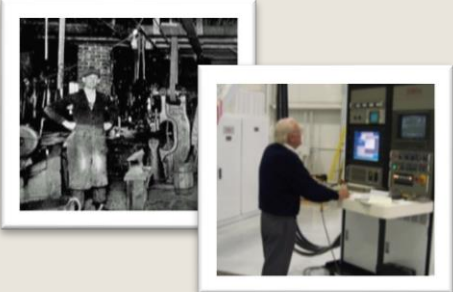
- ❑ **Materials Joining**
 - ❑ Electron Beam Welding
 - ❑ TIG Welding
 - ❑ Resistance Welding
 - ❑ Laser Welding
- ❑ **Thermal Processing (Laser, Heat Treat, Braze)**
- ❑ **EDM (Hole Drilling/Wire)**
- ❑ **Turning**
- ❑ **Milling/Drilling**
- ❑ **Forming**
- ❑ **Inspection**
 - ❑ CMM, Optical Comparator, Layout
 - ❑ NDT (FPI - internal, X-ray/UT/MPI - OV)
 - ❑ RF Frequency Tuning
 - ❑ Vacuum Leak Detection
 - ❑ MET lab
- ❑ **Cleaning (Ultrasonic, Alkaline, BCP, etc.)**
- ❑ **Tool Design/Fabrication Group**

Materials

- ❑ Nickel/Cobalt based Hi-temp alloys
- ❑ Titanium
- ❑ Niobium
- ❑ Aluminum
- ❑ Stainless Steel
- ❑ Copper

-A Legacy of Metal Fabrication –
-Spanning Four Generations-

1923 John L. Roark, Blacksmith

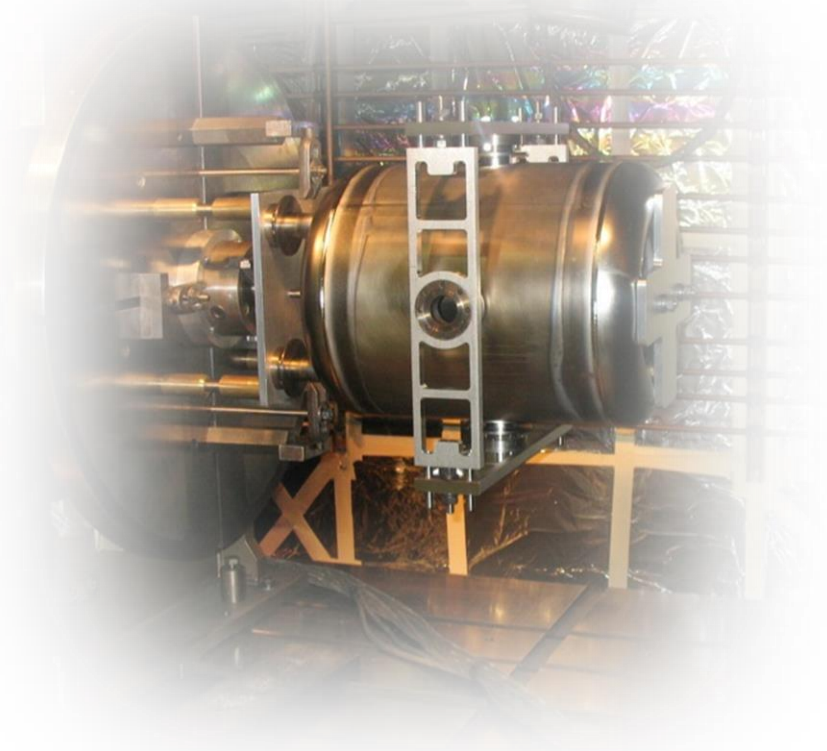


C.F. Roark, Founder
WW II Navy Veteran **2018**

Our SRF History

In 2005 a strategic decision was made to use decades of EBW (electron beam welding), complex fabrication and machining expertise to diversify into markets serving the SRF community.

- ❑ **Technology investments**
 - ❑ EBW
 - ❑ Chemical processing
 - ❑ Frequency Tuning
 - ❑ Leak Detection
- ❑ **FNAL/FRIB development work**
- ❑ **FRIB production**
- ❑ **“Build to print” supplier to SRF community**



Part Gallery – Niobium SRF Fabrication

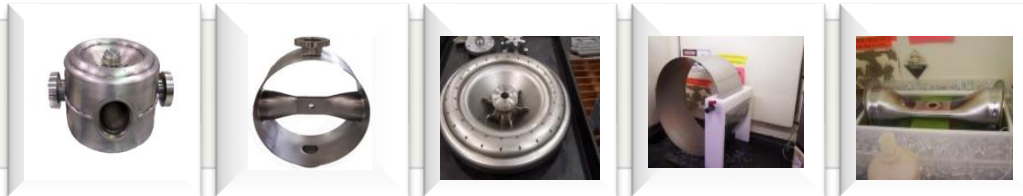
1.3 GHz
9-cell Cavity



1.3 GHz
9-cell Cavity



SSR1
Spoke Resonator



FRIB
1/2 Wave Resonator



Part Gallery – EBW

Aerospace



Energy



Science



Industrial



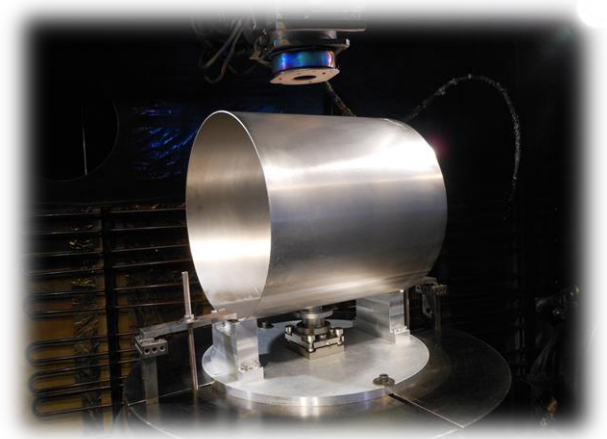
Our experience with supporting the science community...

We have found each team to be more open for discussion in the design stages, focusing on manufacturability. Much different, compared to our general experiences when manufacturing directly with the OEMs in our aerospace business segment.

Without question collaboration at a 'partner' level...



- FRIB Relationship
 - Goals of manufacturability for a production environment
 - EBW
 - Tuning
 - Chemical processing
 - Polishing
 - Borescope techniques
 - Leak detection
 - Lessons learned
 - Longer learning curve for training (subjectivity)
 - Establishing the ‘guard rails’



Outer Conductor EBW

MSU – FRIB Cavities



ILC ...the next steps



ILC – Production

Roark is currently a ‘build to print’ supplier of cavities, strategy for ILC preparation would include;

- ***Equipment upgrades for High Energy (HE) application***
- ***Cavity ‘process finishing’ capability including nitrogen doping***
 - ***Potential partnering arrangement***
- ***Infrastructure***
- ***Training***

