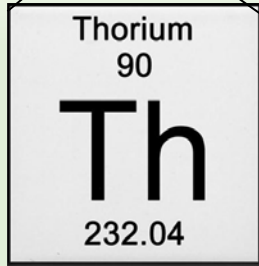
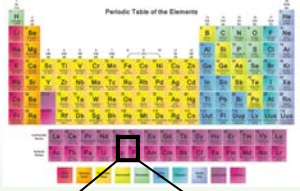


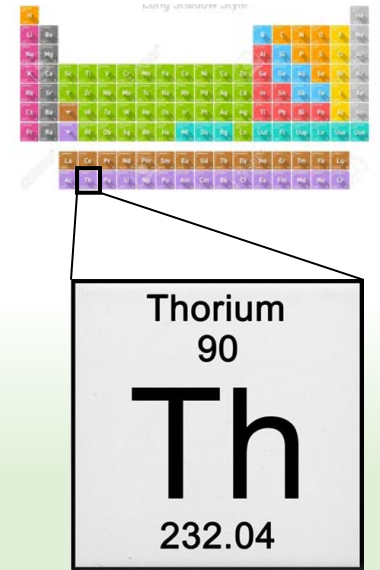
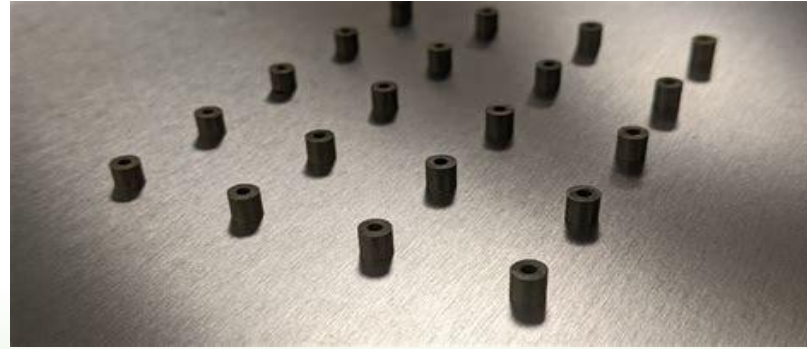
Thorium



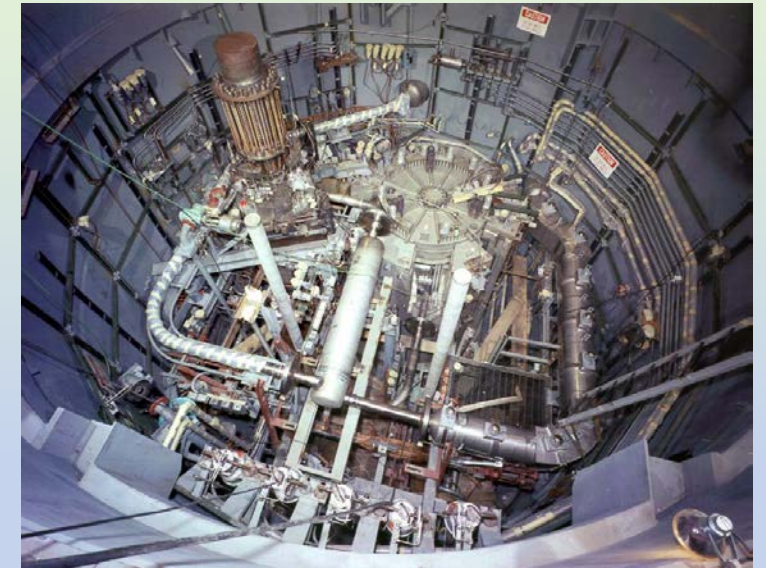
- Thorium is a naturally occurring element found in abundance in the USA
- Slightly radioactive (alpha-emitter)
- Not Fissile, Thorium is Fertile (can not undergo fission on its own), inherently safe to handle
- Discovered in 1829 in Norway
- A free byproduct of critical Rare Earth metal Mining
- Can be fabricated as fuel for use in current reactor fleet, even better suited for Advanced Molten Salt Reactors
- Multiple non-nuclear industrial uses, such as advanced alloys, catalysts, ceramics, optical coatings



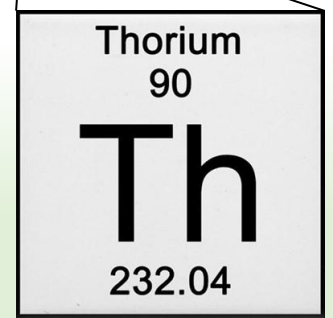
Nuclear Fuel



- Thorium first gained attention from ORNL in the 50s to fuel breeder reactors and advanced designs such as Molten Salt Reactor (MSRE)
- No isotope separation enrichment needed, Th232 most common isotope (99.98%) can be used “as is”.
- Current domestic Uranium production is less than 1% of our needs.
- Multiple companies currently developing direct replacement Th-Fuel Rod Assemblies in USA, EU and China. [Clean Core Thorium Energy]
- Natural Thorium has extremely long half-life (14.5 billion years) but produces short-lived waste when used as fuel (<200 years, not 10,000 as the current LWR fleet produces). Long life equals low radiation
- In certain reactors, Thorium decay chains produce promising “daughter isotopes” for oncology treatments, currently limited studies by ORNL and Terra Power (Bill Gates) as well as startup Curio Inc.



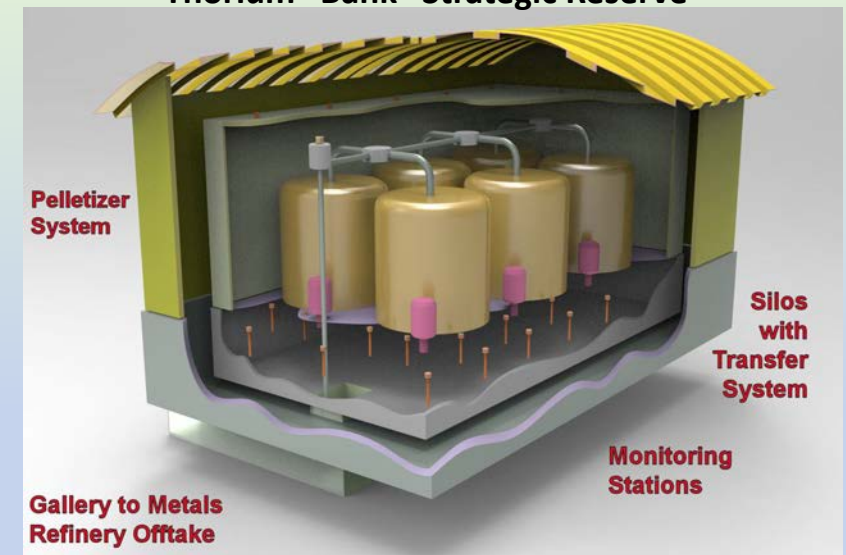
Thorium & Rare Earth Metals



- Thorium is always co-located with rare earth deposits.
- Thorium is also usually present in phosphate mine tailings and waste streams.
- Currently, Thorium is classified as “Source Material” it creates regulatory obstacles for mining, transporting and separation of Rare Earth ores.
- A domestic Rare Earth Magnets and Metals industry will require a fully licensed and managed storage repository to safely handle, process and store separated Thorium byproduct.
- This Thorium Repository would enable domestic rare earth metals production and assume all liability.
- Thorium Repository would lead advanced R&D into fuel and industrial uses.

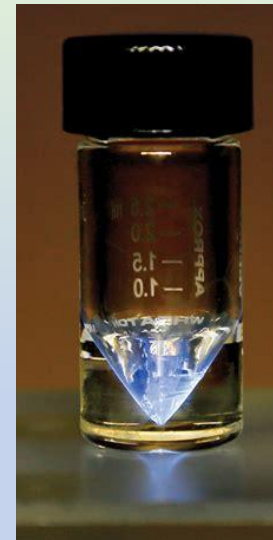
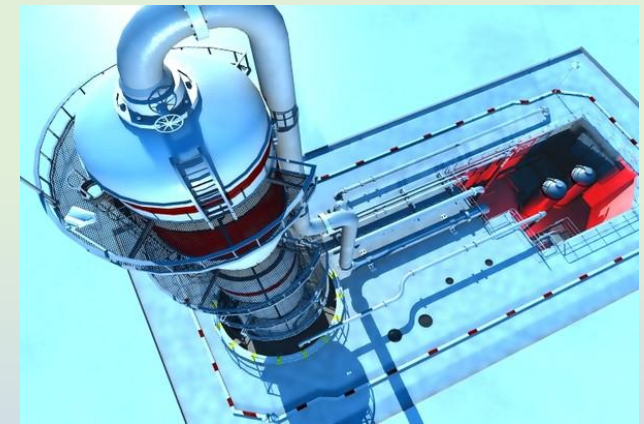
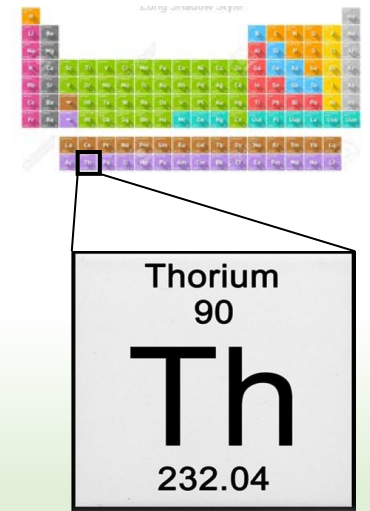



Thorium “Bank” Strategic Reserve



Industrial Thorium Uses

- Catalysts for the chemical industry
- A source for medical Isotopes
- Advanced super-alloys needed for defense, energy, transportation and construction sectors.
- Used in specialty welding applications for advanced materials
- High-Temperature ceramics
- Super conductors and Magnetrons
- High performance lenses and coatings

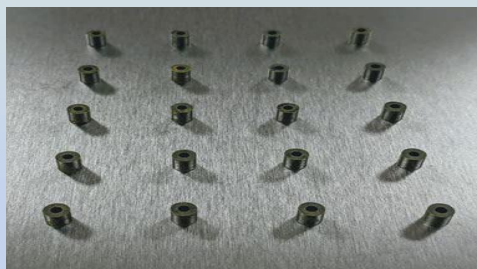
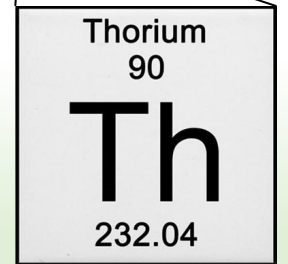



Magnesium- Thorium Alloy

- Mag-Thor
- Mg-Th-Zr
- Mg-Th-Zn-Zr
- Mg-Ag-Th-(rare earth) - Zr

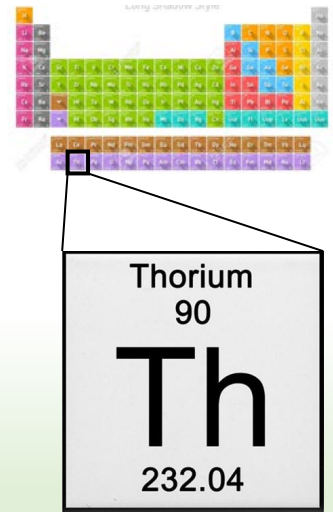
Key Points

- Domestic Thorium Abundance (known USA reserve 440,000 tons is conservative).
- Must be dealt with to revive domestic Rare Earth Industry and maintain phosphate production.
- Used in Next-Gen advanced nuclear and current fleet.
- Multiple industrial and medical uses.
- Safe to transport, handle and store. Blanket regulations for all “source materials” cause obstacles. This policy must be reformed.
- Key to advanced energy, critical materials and industrial base.



ANEEL Fuel using ThO₂ & HALEU

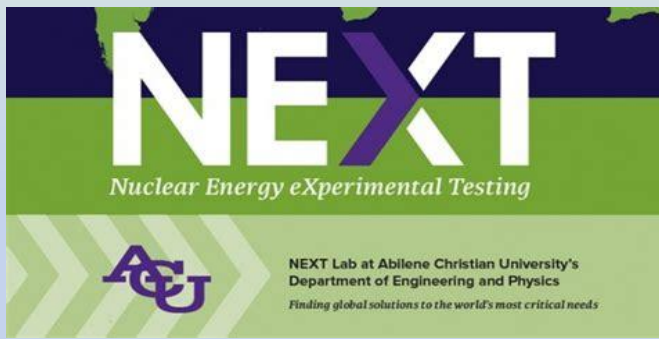




Call to Action

- Support Thorium and Rare Earth Metals Facility, Mining Rare Earths with no Domestic Processing perpetuates the problem.
- Support proposed “Rare Earth Tax Credit” Legislation
- Support Thorium Nuclear Fuel Research by Private Stakeholders and National Labs & Universities [such as Abilene Christian University].
- Demand DOE Issue “Alternative Fuel Report” To Congress stipulated in the 2020 Energy Act – See Title II, Sec, 2001, sub-section (b)(3). Was due to Congress June 2021 – over 12 months late.

**Critical Amendments to Senate
companion bill H.R. 5033
*Rare Earth Magnet Manufacturing
Production Tax Credit Act***



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1 DIVISION Z—ENERGY ACT OF
2 2020

3 SEC. 101. SHORT TITLE; TABLE OF CONTENTS.

4 (a) SHORT TITLE.—This division may be cited as the

5 “Energy Act of 2020”.



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