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## ANSI Webinar Critical Minerals: ASTM B10 on Reactive and Refractory Metals and Alloys

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## ASTM International- Over a Century of Openness

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- Established in 1898
- 13,000 + ASTM Standards developed from the expertise of over 30,000 members from 150+ countries
- 8,000+ International Members from 135 countries
- 5,100 ASTM standards used in 75 countries
- International Standards Developer according to WTO principles: Annex 4 of WTO/TBT Agreement
- ASTM's transparent process is open to anyone around the globe.
- Collaborate with organizations, academia, governments, trade associations, and consumers on the development of standards
- Worldwide acceptance and trust comes from more than 125- plus years of our rigorous consensus process.



## ASTM Committee B10 on Reactive and Refractory Metal Alloys – Activity Information

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### B10 Main Scope:

The ASTM B10 committee is dedicated to advancing specifications, broadening technical knowledge, and encouraging research into reactive and refractory metals along with their alloys. The core metals that fall within the scope of ASTM B10 comprise tantalum, niobium, hafnium, molybdenum, titanium, tungsten, vanadium and zirconium.

- **Formed:** 1965
- **Total:** 54 standards
- **Committee Makeup:** 94 Members,
  - 9 Countries Participate

### B10 Subcommittees

- B10.01 Titanium
- B10.02 Zirconium and Hafnium
- B10.03 Niobium, Tantalum, and Vanadium
- B10.04 Molybdenum and Tungsten
- **B10 Administrative Committee**
- B10.92 on Awards

### B10.93 Symposium

- **Zr Symposium** - The purpose is to provide a forum for exchanging new information on the fabrication, testing, development, and characterization of zirconium-based materials used in the nuclear industry. Of particular interest are studies that focus on identifying and understanding the mechanisms and behaviors of these materials.
- Basic Metallurgy and Processing; Fabrication and Alloy Development; Mechanical Behavior; Corrosion and Hydrating; In-Reactor Performance; Irradiation Effects;
- High-Temperature and Transient Phenomena; Mechanistic Modeling of Processing or Performance; Intermediate and Long-Term Storage Performance; And Coatings for Accident Tolerant Fuel.
- **Next Symposium:** 2028, South Korea

# ASTM B10 Subcommittee Standards –

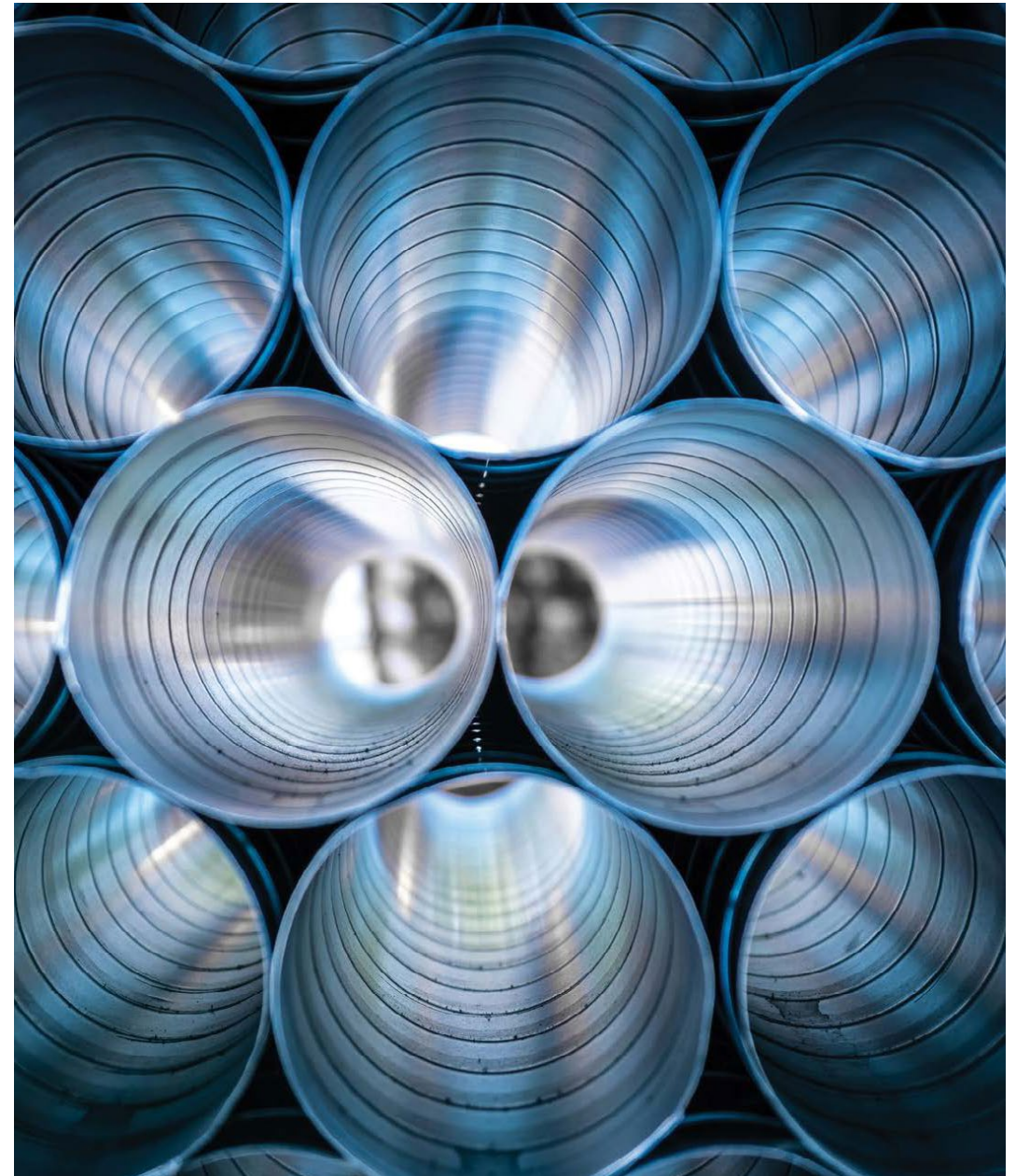


- B10.01 on Titanium (total: 15 standards)
  - B265 — Standard Specification for Titanium and Titanium Alloy Strip, Sheet, and Plate
  - B338 — Standard Specification for Seamless and Welded Titanium and Titanium Alloy Tubes for Condensers and Heat Exchangers
  - B367 — Standard Specification for Titanium and Titanium Alloy Castings
  - B381 — Specification for Titanium and Titanium Alloy Forgings
- B10.02 on Zirconium and Hafnium (total: 16 standards)
  - B350/B350M — Standard Specification for Zirconium and Zirconium Alloy Ingots for Nuclear Application
  - B550/ B550M — Specification for Zirconium and Zirconium Alloy Bar and Wire
  - B551/ B551M — Specification for Zirconium and Zirconium Alloy Strip, Sheet, and Plate
- B10.03 on Niobium, Tantalum, and Vanadium (total: 12 standards)
  - B652/B652M — Standard Specification for Niobium-Hafnium Alloy Ingots
  - B654/B654M — Standard Specification for Niobium-Hafnium Alloy Foil, Sheet, Strip, and Plate
  - B708 — Standard Specification for Tantalum and Tantalum Alloy Plate, Sheet, and Strip
- B10.04 Molybdenum and Tungsten (total: 11 standards)
  - B386/B386M Standard Specification for Molybdenum and Molybdenum Alloy Plate, Sheet, Strip, Foil, and Ribbon
  - B387/B387M- Standard Specification for Molybdenum and Molybdenum Alloy Bar, Rod, and Wire
  - B777- Standard Specification for Tungsten Base, High-Density Metal

## Who is Involved-

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- **Over 7 Technical Committees have collaborated on B10 standards:**
- A01- Steel, Stainless Steel and Related Alloys
- B02- Nonferrous Metals and Alloys
- B09- Metal Powders and Metal Powder Products
- E01- Analytical Chemistry for Metals, Ores, and Related Materials
- F04- Medical and Surgical Materials and Devices
- F42- Additive Manufacturing Technologies
- F47- Commercial Spaceflight



## Standards in Progress

### What is Next-

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#### – B10.03 Niobium, Tantalum, and Vanadium

- WK87647 -New Specification for Vanadium and Vanadium Alloy Ingots
- Scope: This specification covers unalloyed and alloyed vanadium ingots.
- Rationale: bulk of vanadium produced is used in various high-strength or high-performance 5 alloys, some V-alloys are proposed for special applications.

#### – B10.04 Molybdenum and Tungsten

- B1024/B1024M-23 -Standard Specification for Isotropic Pure Molybdenum





# ASTM B10 Standards Impact/ Use-

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## **Aerospace & Defense**

- Titanium, niobium, and molybdenum alloys are essential for high-strength, lightweight, and heat-resistant components.
- Used in jet engines, airframes, rocket propulsion systems, and missile components.
- Standards ensure material reliability under extreme temperatures and stresses.

## **Nuclear Energy**

- Zirconium and hafnium alloys are critical for nuclear fuel cladding and reactor components due to their low neutron absorption.
- Support safety, purity, and dimensional control in nuclear environments.

## **Chemical Processing & Corrosion-Resistant Equipment**

- Titanium, tantalum, niobium, and zirconium are used in heat exchangers, reactors, piping, and valves exposed to highly corrosive chemicals.
- Standards ensure chemical purity, corrosion resistance, and mechanical integrity.

## **Electronics & Semiconductor Manufacturing**

- Tantalum and tungsten are used in capacitors, thin-film coatings, sputtering targets, and semiconductor fabrication equipment.
- Standards help maintain consistent electrical and physical properties.

## **Medical Devices**

- Titanium and its alloys are widely used in implants, surgical tools, and prosthetics.
- Standards ensure biocompatibility, mechanical strength, and material cleanliness.

## **High-Temperature Industrial Applications**

- Tungsten and molybdenum are used in furnace components, lighting filaments, and high-temperature tooling.
- Standards define thermal performance and material stability.

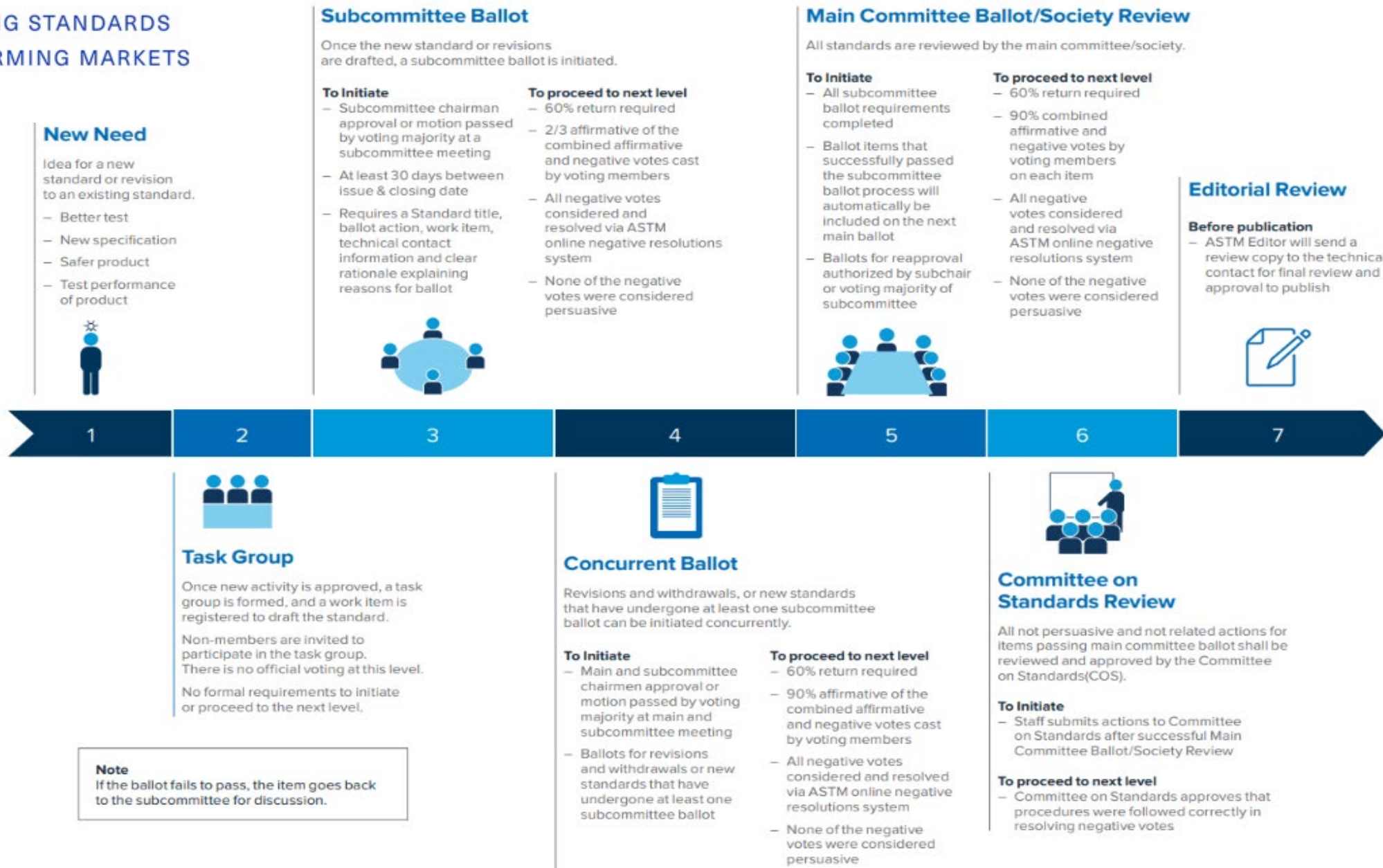
## **Research & Materials Development**

- Laboratories and manufacturers use B10 standards for testing, classification, and quality assurance when developing new alloys or validating material performance.

# ASTM International Process- how standards are developed

## Guiding Principles:

- ✓ Voluntary Consensus
- ✓ Transparency
- ✓ Balance of Interest
- ✓ Due Process
- ✓ Open Participation



## Participation / How to Join ?

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- Join ASTM
  - <https://www.astm.org/membership-participation/membership>
- Attend ASTM Committee Week – **future dates for B10:**
  - **Dates:** Tuesday November 03, 2026 - Wednesday November 04, 2026
  - **Location:** Hyatt Regency Jacksonville Riverfront, 225 East Coastline Drive, Jacksonville, Florida
  - **Event Name:** November 2026 Committee Week
  - Search ASTM by Committees (future dates/ locations): <https://member.astm.org/meeting>
- Reach out to Committee / Sub-Committee Members to discuss committee activities.
- Resource: <https://astm101.training.astm.org/#/>
- Contacts:
  - Jennifer Tursi ([jtursi@astm.org](mailto:jtursi@astm.org))
  - Rick Porter, Scanacon, Inc., B10 Chair - [porterrlp@aol.com](mailto:porterrlp@aol.com)



Scan the QR code to learn  
more about Committee B10.