

Sputter Aluminum Status

~

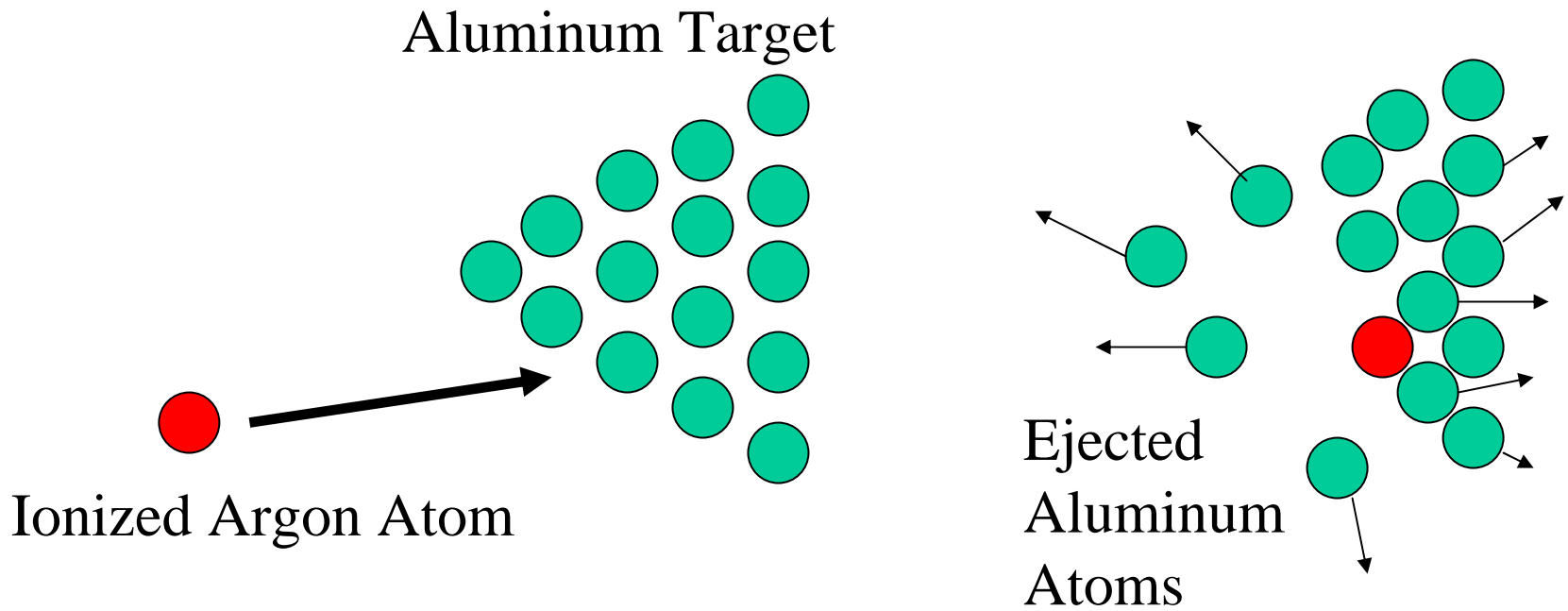
July 20, 2004

~

Stephen Gaydos
Boeing – St. Louis

IVD / Sputter Aluminum

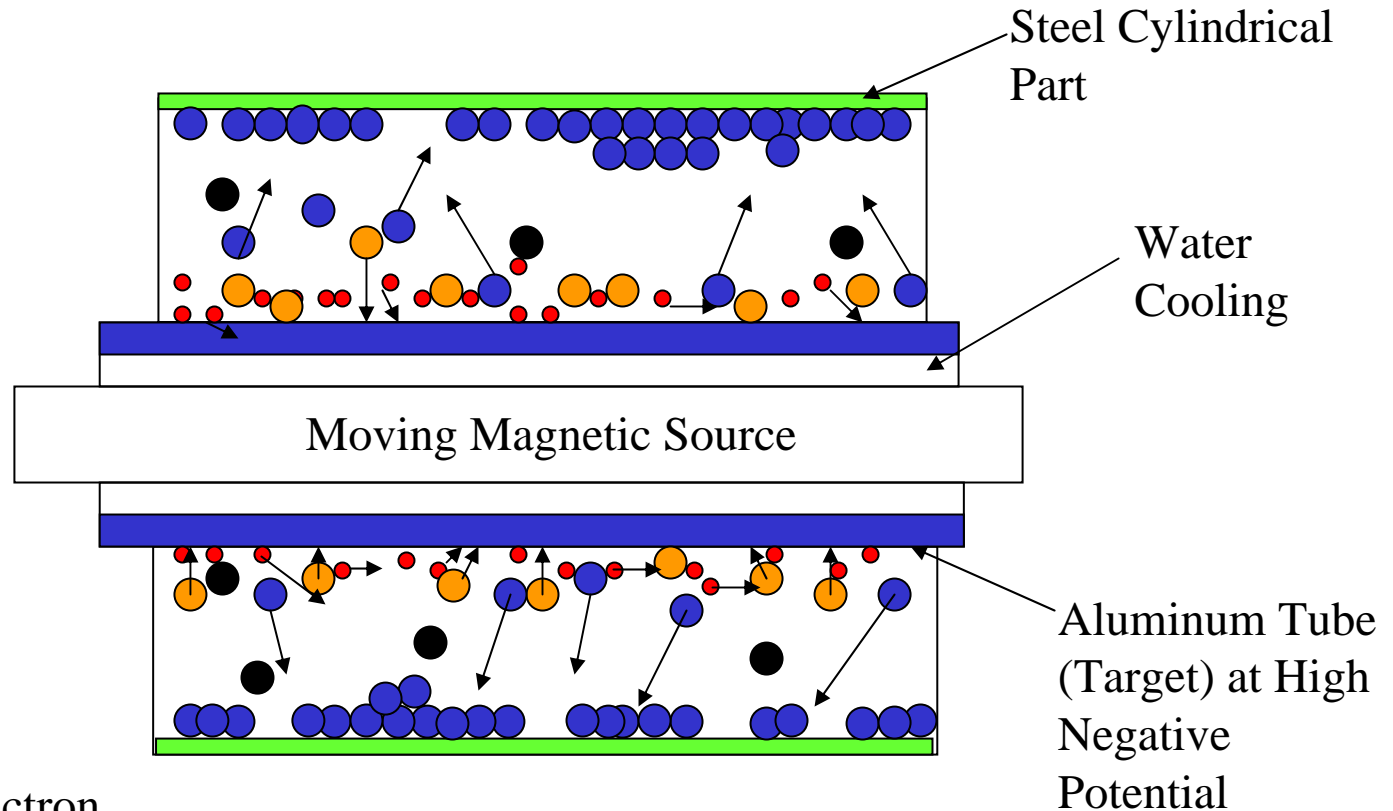
- IVD Aluminum Used on Exterior of Aircraft Parts
- Sputter Aluminum for Interior of Parts -
 - Aluminum Coat the Inside of Parts with “Plug & Coat” Magnetron Sputter System
 - Aluminum Sputter Coat Can be Applied to Parts Already In An IVD Al Coating Chamber



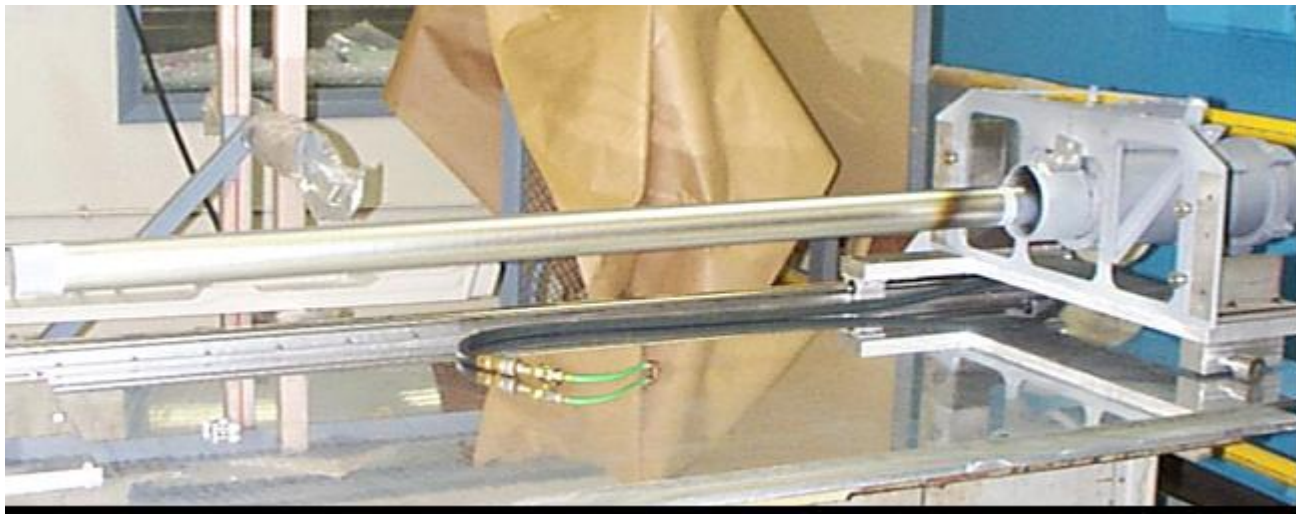
Sputtering – The Atomic Billiards Game

Magnetron Sputtering Process

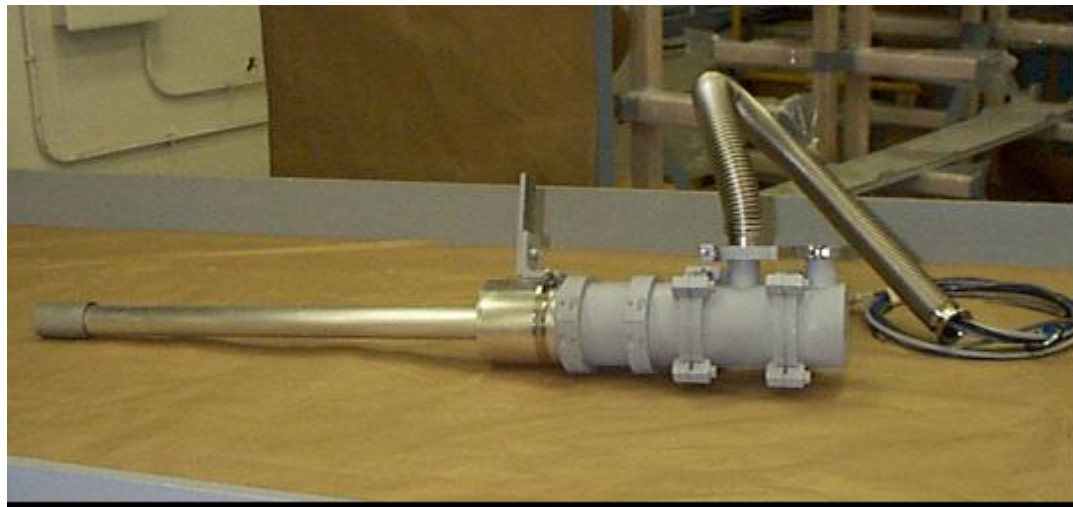
(Magnetic Field Addition to the Electric Field Increases Sputtering Rate)



- Electron
- Argon Molecule
- Argon Ion
- Aluminum Atom

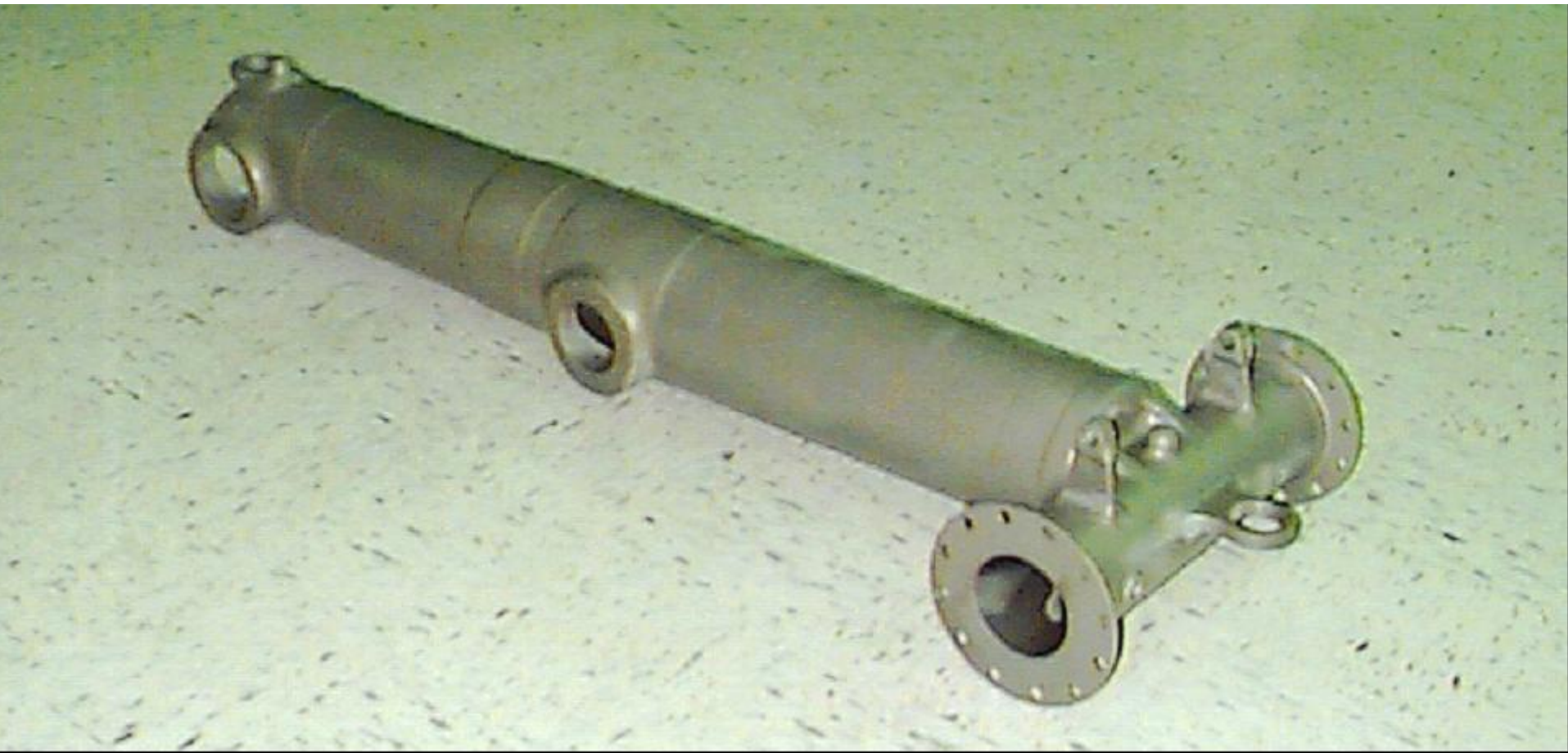


Long “Plug & Coat” Sputter Probe

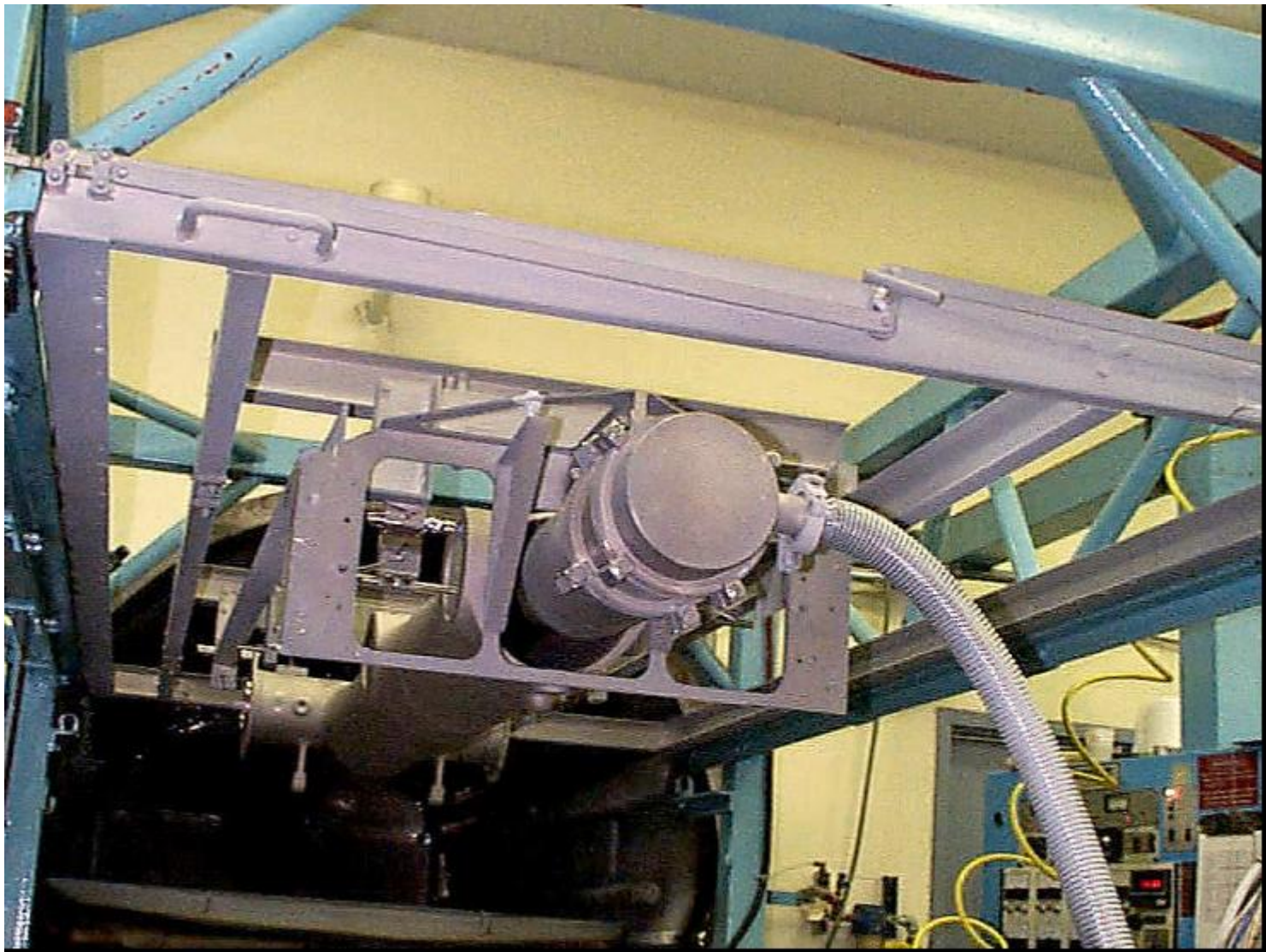


Short “Plug & Coat” Sputter Probe

3rd Generation - Production Ready “Plug & Coat” Sputter Probes



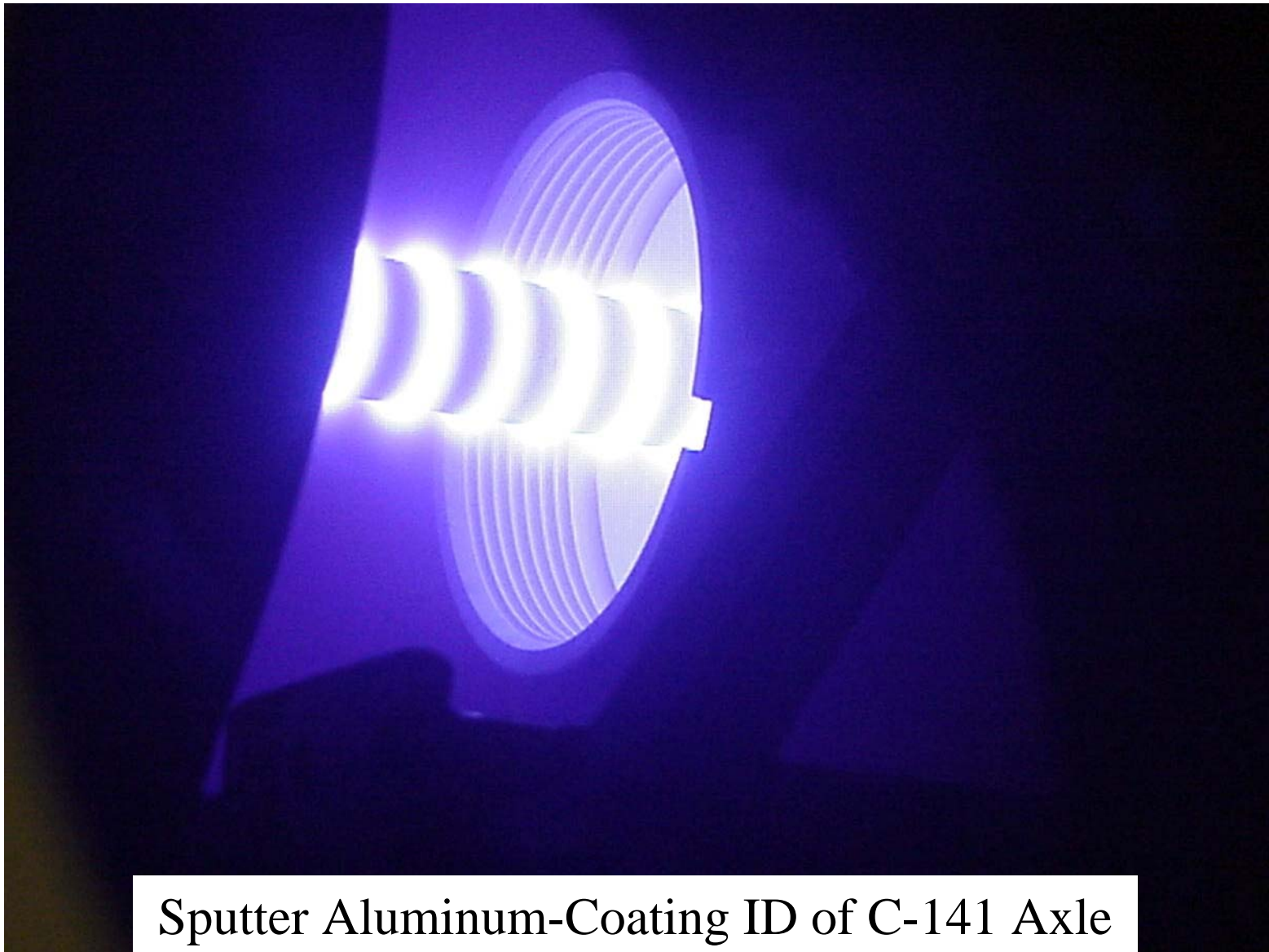
KC-135 Truck Beam



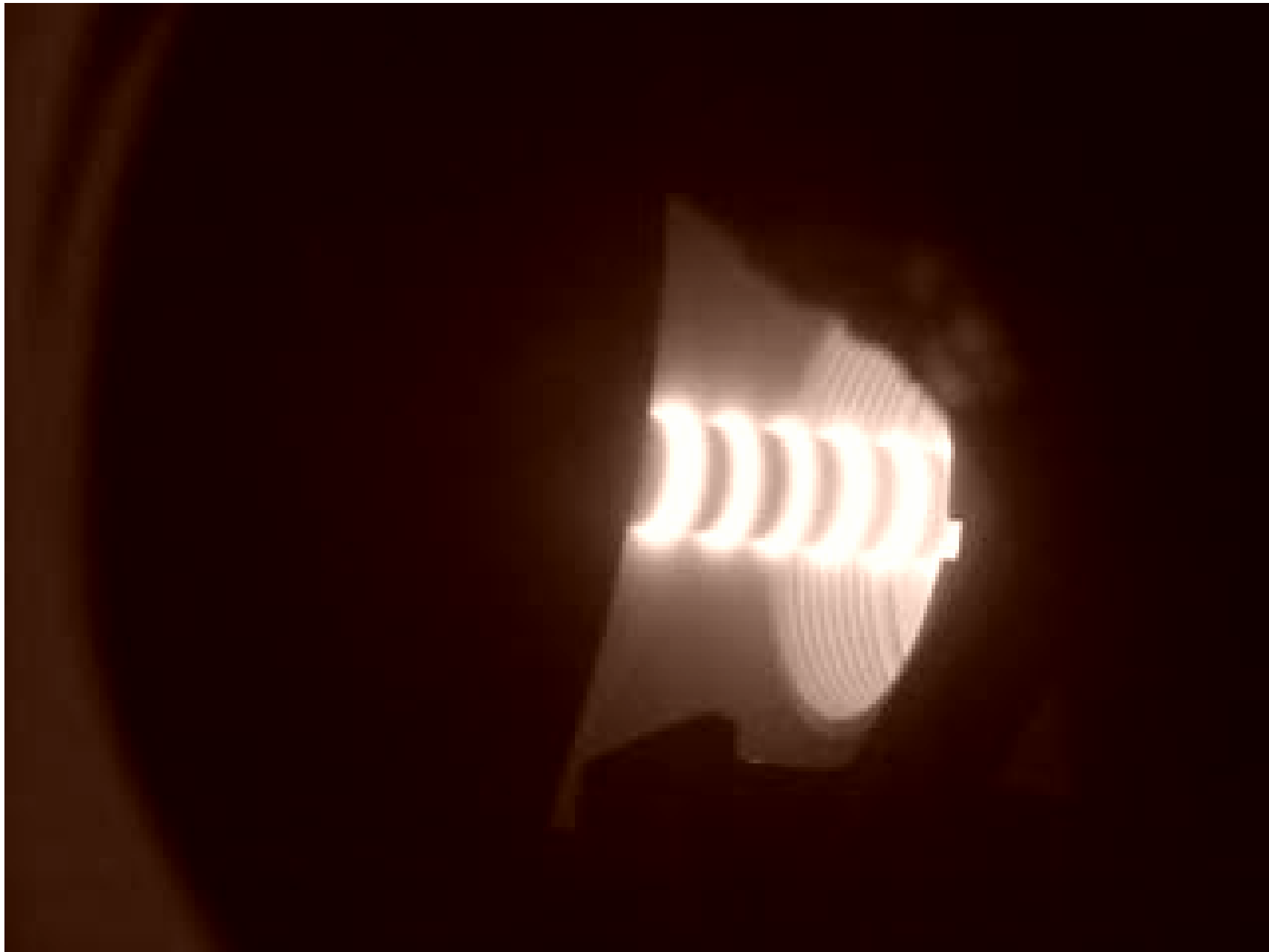
Long Probe Installed in KC-135 Truck Beam

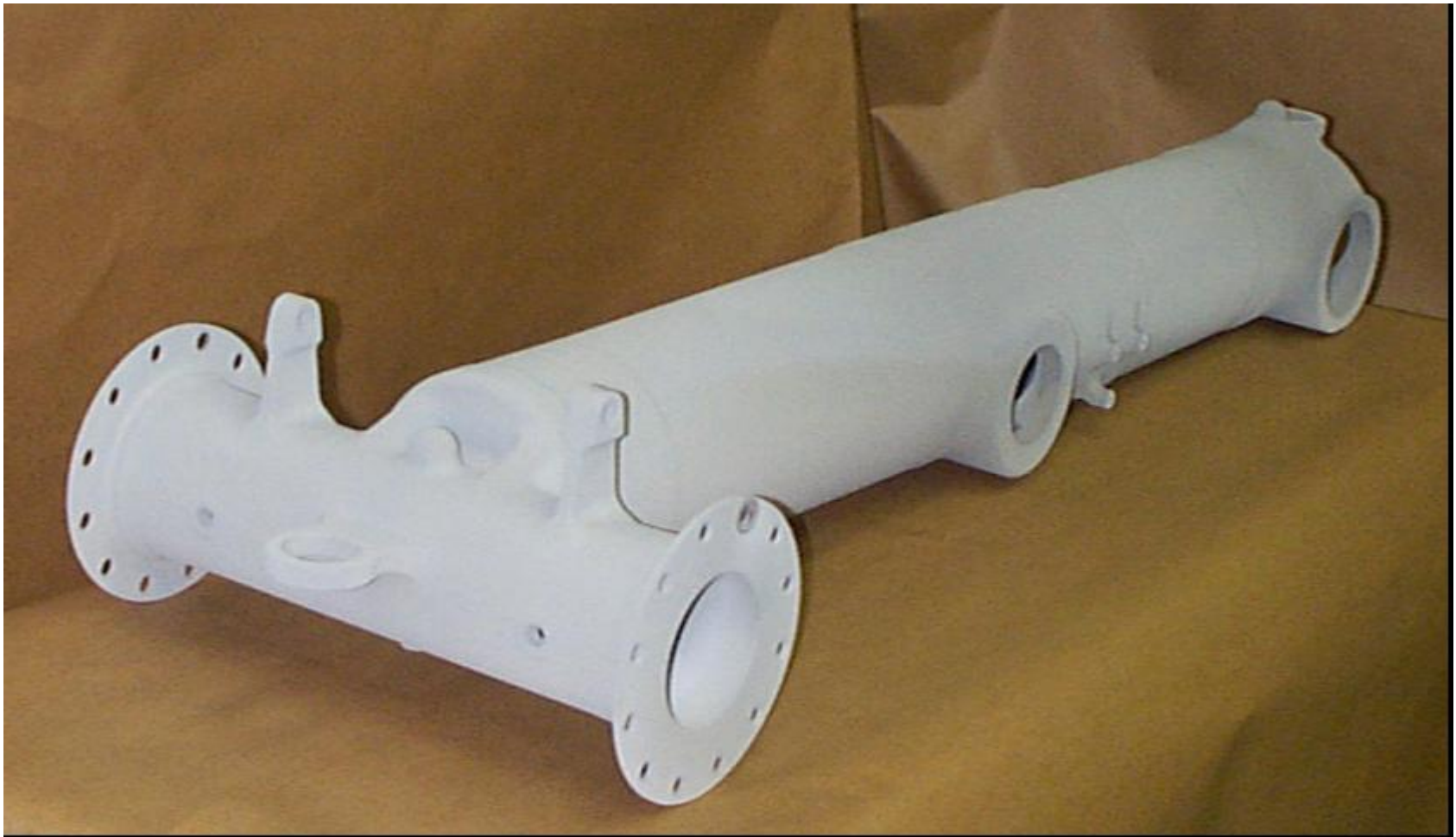


Sputter and IVD Aluminum Coating
of C-17 Axle Completed



Sputter Aluminum-Coating ID of C-141 Axle





**KC-135 Truck Beam With Aluminum Coating on
Interior and Exterior Surfaces**

Sputter Aluminum Status

- Completed Production Demo on Sept. 7, 2000 at Boeing – St. Louis
 - Coated O.D. and I.D. of KC-135 Landing Gear Part
- Sputter Characterization Tests Completed May 2001
 - Sputter Aluminum Meets and Exceeds the Requirements in MIL-DTL-83488
- Contract to Install Sputter System at Hill AFB
 - Awarded October 10, 2001

Sputter Aluminum Status (Cont.)

- Sputter Aluminum Equipment Installed in IVD Coater #1 at Hill AFB
 - Demo for OO-ALC, Boeing – Long Beach (C-17), and BF Goodrich Personnel October 2002
- Sputter Equipment Training of Hill AFB Workers Completed March 2003
- Hill AFB Applying Sputter Aluminum Coating to ID of Landing Gear Parts
 - March 2003 to Present

Sputter Aluminum Status (Cont.)

- August 2003 – Conducted Sputter Aluminum Demo for Engineers from Other Air Force ALCs and Navy Depots
 - Navy Depot – Cherry Point Expressed Interest
 - Meeting Scheduled for Aug./Sept. 2004 to Discuss Details
- P² Project to Qualify Sputter Aluminum for Production C-17 Landing Gear Parts
 - Project Started October 2003
 - Several C-17 Axles Already Coated at Hill AFB (Apr – Jun 2004)

Future Work

- Complete Qualification Tests for C-17 Program
 - Authorize Use on C-17 Landing Gear Parts
 - Apply Sputter Aluminum to New and Used C-17 Landing Gear Parts
- Install Sputter Aluminum Equipment at a Navy Depot
- Continue to Utilize Sputter Aluminum Equipment at Hill AFB