



# The Macrogram

Hartford Chapter of the ASM International  
Build on our Strengths - Leverage our Diversity - Network to Succeed

## MONTHLY MEETING – TOPIC

October 12, 2010

**Topic: The Vacuum Heat Treatment of Titanium Alloys for Commercial Airframes.**

**Speaker:** Mr. Robert Hill Jr.  
ASM Trustee (2010 - 2012)  
President, Solar Atmospheres Western PA  
Hermitage, PA ([www.solaratm.com](http://www.solaratm.com))

**Directions: Margaritas Mexican Restaurant - 350 Roberts St., East Hartford, CT, Ph: (860) 289-7212 I-84 Exit 58 Roberts Street:** From the East, turn right onto Roberts St. and the restaurant is immediate on the left. From the West, turn left on to Robert St. and after the first light the restaurant is immediate on the left.

**Agenda:**  
Cocktails: 5:30-6:30 PM  
Dinner: 6:30-7:30 PM  
Program: 7:30-8:30 PM

**Program Charges:**  
Regular Members - \$28.00  
Retirees - \$15.00  
Full Time Students - \$15.00

**Technical Chairperson:** Sam Christy  
**Reservations:** Call Linda at Service Steel Aerospace (860) 583-3336 by noon October 7th.  
**Thanks!**

### Abstract:



From a materials' point of view, the Boeing 787 Dreamliner is one of the most revolutionary leaps in the history of manufacturing. In designing the 787 airframe with 50% of its weight as composites, Boeing necessitated the use of more titanium for compatibility and extended use of newer, near-beta, alloys for higher strength components. Fifteen percent of the 787's airframe is titanium. The four main areas where the largest concentration of titanium is used are:

1. Landing Gear and Fittings- Ti 5553
2. Floor Structure- Ti 6-4
4. Extrusions- Ti 6-4
5. Nacelles- Ti 6-4

For this discussion we will review basic vacuum and pyrometry technology. We will then relate this information to the critical heat treatment of particular airframe components and the capacity increases that were necessary to support this growth.

### Bio:



Bob Hill has over 30 years of metallurgical experience involving a wide range of heat treating methodologies. During the past ten years Bob has specialized in the development of large vacuum furnace technology and titanium processing capabilities for Solar Atmospheres.

In 2000 Bob took on the responsibility of starting Solar Atmospheres second plant located in Hermitage, PA. At this location there are twelve vacuum furnaces including the world's largest, 36 feet long with a weight capacity of 150,000 lbs. Over the period of ten years the plant's sales have increased an average of 35% per year for total sales of \$15 million in 2008. This 50,000 square foot facility primarily services titanium that is used in the aerospace, medical, and power generation arenas throughout the country.

Bob has been a member of ASM since 1980. He has published numerous articles on vacuum technologies and vacuum heat treating applications. Bob has publicly presented these papers at the National ASM Heat Treating Conference, SME events, and at various local chapters throughout the country.

In 2000-2001, Bob served as the Chairman of the Philadelphia Liberty Bell Chapter of ASM. Additionally he co-chaired the 2003 and 2005 ASM Heat Treating Society Conference and Exposition. He received a B.S. from Millersville University and a degree in Metallurgy from Spring Garden College.