EO M440.01 – IDENTIFY AEROSPACE MATERIALS

1. **Performance**: Identify Aerospace Materials
2. **Conditions**:
   a. Given:
      (1) Supervision, and
      (2) Assistance as required.
   b. Denied: Nil.
   c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard**: The cadet shall identify various aerospace materials, to include:
   a. aluminum,
   b. magnesium,
   c. titanium,
   d. stainless steel,
   e. fibreglass,
   f. aramid,
   g. carbon / graphite, and
   h. ceramic.
4. **Teaching Points**:

TP	Description	Method	Time	Refs
TP1	Discuss: a. metals used in aerospace construction, to include: 1. aluminum, 2. magnesium, 3. titanium, and 4. stainless steel; b. material tests, and c. orbit environment.	Interactive Lecture	15 min	C3-136 (pp. 2-1 to 2-15) C3-294
TP2	Discuss composite materials used in aerospace construction, to include: a. fibreglass, b. aramid, c. carbon / graphite, and d. ceramic.	Interactive Lecture	10 min	C3-136 (pp. 3-22 to 3-27)

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Verify against the official publication.

5. **Time**:

a.	Introduction / Conclusion:	5 min
b.	Interactive Lecture:	25 min
c.	Total:	30 min

6. **Substantiation**: An interactive lecture was chosen for this lesson to introduce the cadets to aerospace materials and to generate interest in the subject.

7. **References**:

   a. C3-136 ISBN 0-88487-207-6 Sanderson Training Systems. (2001). *A&P technician airframe textbook*. Englewood, CO: Jeppesen Sanderson Inc.

   b. C3-294 Silverman, E. M. (1995). *Space environmental effects on spacecraft: LEO materials selection guide*. Hampton, VA: NASA Langley Research Center. Retrieved November 27, 2008, from http://see.msfc.nasa.gov/mp/NASA-95-cr4661pt1.pdf

8. **Training Aids**:

   a. Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area.

   b. Samples of materials, to include:

      (1) metals, to include:

         (a) aluminum,

         (b) magnesium steel,

         (c) titanium steel, and

         (d) stainless steel;

      (2) composite cloth, to include:

         (a) fibreglass,

         (b) aramid,

         (c) carbon / graphite, and

         (d) ceramic.

9. **Learning Aids**: Nil.

10. **Test Details**: Nil.

11. **Remarks**: Cadets who are qualified Advanced Aerospace may assist with this instruction.

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