UFO POTPOURRI

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MAGNETORHEOLOGICAL (MR) MATERIALS
(Speculation)

For more than half a century military and civilian pilots, scientists and technicians, police officers and business people, as well as ordinary citizens have been reporting characteristics of unidentified objects (UFO) that they described in terms that appeared to be impossible, at least during the age in which they were reported. For that reason many of these incidents were ridiculed or ignored, while others were put in the "gray basket" awaiting future technology breakthroughs. On the whole, the science community avoided them even though the questions they posed had great potential for changes in materials and processes and technological applications in general. Therefore, this may be a good time to go back and reexamine past observations in the light of new developments.

For the purpose of this discussion, we will use the term UFO, meaning unconventional flying object, for the reports of vehicles of various sizes and shapes and how the use of magnetorheological (MR) materials might explain some of their reported but unusual characteristics. Some of the reported characteristics are as follows:

- The UFO makes a right angle turn while traveling at high speed. How can the various systems withstand the forces involved? How could the crew keep from passing out or being crushed? "G-suits" used by jet pilots would not give sufficient protection.
- The UFO changes shape, seeming at times of changes in speed and direction. What material could react fast enough to account for the morphing conditions that have been reported?
- The UFO lands on rough terrain, nevertheless landing supports appear rapidly and adjust automatically to the shape of the terrain. While these often do not appear to be aircraft type landing gear, they perform the same function.
- The UFO comes in hot but quickly comes to a halt and lands without slamming down. The landing seems to be dampened in some way to prevent shock to the vehicle.

The use of magnetorheological materials could explain some of the observed UFO characteristics. One description of MR materials can be found in "Space-Age Goop Morphs Between Liquid and Solid," written by Erik Baard, technology correspondent for Space.com. According to Baard, "Magnetorheological materials are fluids that solidify into a pasty consistency in the presence of a magnetic field (as molecules assemble in

somewhat stiff chains along field lines), and the re-liquify when that force is removed. One can also achieve a similar effect with electric fields. In either case, the fluids can do work that in the past involved intricate moving parts."

MR materials are soft and respond to stimuli faster than human tissue. The simple forms used today take advantage of particles suspended in a fluid that becomes rigid when an electrical or magnetic field is applied. They have the potential for shape-changing, but that is not part of current MR applications. Baard says we need a breakthrough in "precise digital control of magnetic fields" to if we are to grow the number of MR applications.

At the present time MR materials can be used in simple applications such as exercise machines or automobile shock absorbers, but what if they were used in exotic applications in space vehicles? Could their use explain the aforementioned characteristics noted in UFO reports?

- Vehicle structures surrounded by lightweight enclosures containing MR material might be able to protect the vehicle from the effects of high-G maneuvers.
- Pilot seats or suits could be contoured to precisely fit the pilot's body and activated to protect the pilot during a high-G maneuver or impact.
- As shape-shifting technology progresses, new application for MR materials could provide the shape changing appearance when the control systems advance sufficiently to allow shape-changing of large structures.
- Landing gear constructed of MR materials could be rapidly deployed and shaped as necessary for the surrounding conditions.
- Vehicles and crew could be protected from the impact of landing through use of MR materials to adapt shock-absorbing devices to match loads, speed and direction.

The complete field of MR materials applications may still be years in developing, but the potential is vast. As the field advances we may find it contributes logically to explaining more of the characteristics described by the witnesses of UFO incidents.