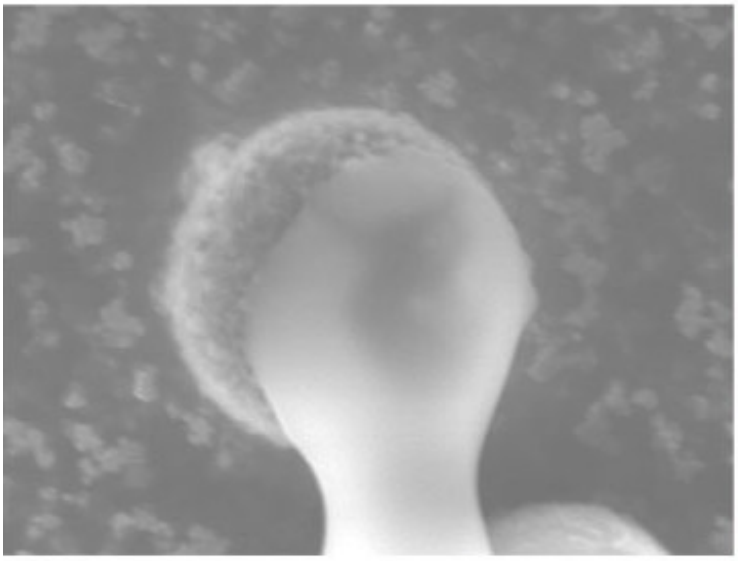
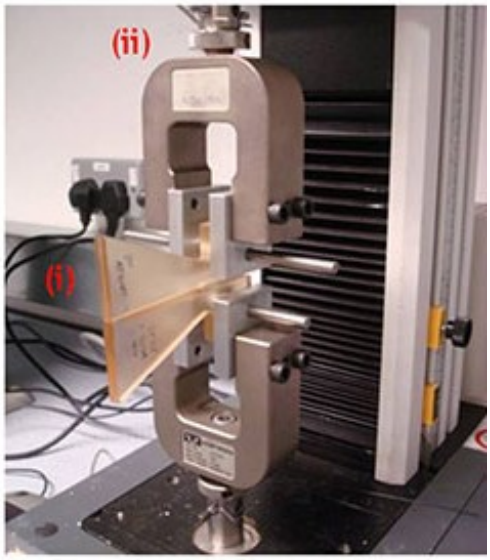
Scientists making progress on self-repairing aircraft parts

June 24 2015, by Bob Yirka





(Phys.org)—A team of researchers working at Bristol University in England recently briefed the press on progress they have made on creating self-healing carbon fiber reinforced composite materials—they reported that they have successfully tested their new technology with airplane wings.

As they take-off, fly and land, aircraft sometimes develop tiny cracks that under the right circumstances can develop into larger cracks which

can lead to material failure—part of modern maintenance is taking X-rays of critical parts to see if cracks have developed. In the future, that may not be necessary, the researchers suggest, because those cracked parts may be able to heal themselves.

The technology is based on the creation of very tiny spheres embedded in a material—they are made of one type of a healing agent. If a crack in the material develops, the sphere breaks, allowing the material inside to seep into the gap that has been created. When the healing agent comes into contact with the regular material, it reacts causing it to slowly harden. The end result is a repaired crack that is hopefully just as strong and durable as the original material. The team reports that they sought to replicate the way nature works when attempting to repair damage, whether bleeding or other types of breakage.

Currently, the new technology is only able to repair extremely small cracks in certain kinds of materials, and it is likely to be expensive. If it does make its way to real aircraft, the team reports, it would likely only be in critical areas. They also note that while they were able to get cracks to heal themselves, there is still work to do—making sure a wing is as strong as the original, getting cracks to heal during weather extremes, etc. They suspect it will be five to ten years before it is ready to go commercial, at least in aircraft. It is possible, they also note, that the same technology could be used as is, or modified for use in other less serious applications, such as nail polish. Down the road, there is speculation that it could even be used to repair cracked phone screens—in the event that engineers fail to come up with a new type of phone glass that will not crack in the first place.