

Developing a superior bonding technology for artificial limbs.

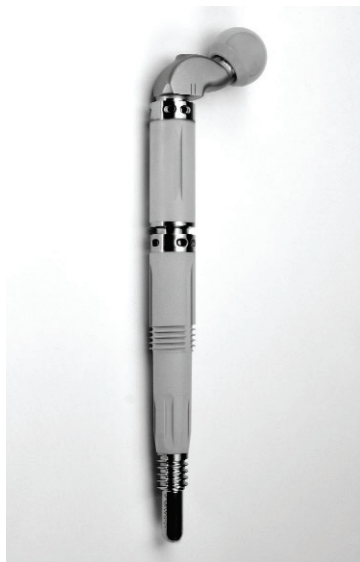
Hip replacement is one of the fastest growing and most competitive areas of orthopaedic surgery, with 540,000 hip replacements being performed annually around the world. A challenge with implanting hip replacements is providing a permanent bond between the femur (thigh bone) and the man made joint. Traditionally, a single piece, wedge shaped prosthesis was percussively inserted into the top end of the femur.

This method of insertion has a number of problems in about 5% of hip replacements, including loosening and leg length problems. Recognising the need to develop a better approach, Portland Orthopaedics developed a tapered, threaded hip replacement that could be screwed into the femur. A further development to enhance the permanency of the bond was the development of a radical new bonding material.

Scientists were well aware of a man made compound called Hydroxyapatite (HA), which contains both calcium and phosphate, the building blocks for the skeletal system, and its ability to encourage a bone to grow towards the prosthesis. HA is thermally unstable and expensive, and the coating thickness and particle sizes are critical for optimal product performance. To resolve these problems, CSIRO commenced development and Monash University refined a plasma sprayed coating.

To ensure that the HA coating was viable, Future Materials' facility at Monash University was engaged to test the product until a consistently high quality sprayable variant of HA was produced.

Now, not only does Portland's unique threaded design give the patient a robust initial femur connection, but it offers stronger bone growth and prosthetic bonding that can only be achieved from the customised HA Spray Process. This gives Portland a powerful value proposition in the marketplace and offers significant international competitiveness.



The tapered screw thread and the white hydroxyapatite (HA) coating on the upper cylindrical section work together to provide a fast and strong bone attachment with the Portlands Orthopaedics artificial hip.