

Knee Implant Technology

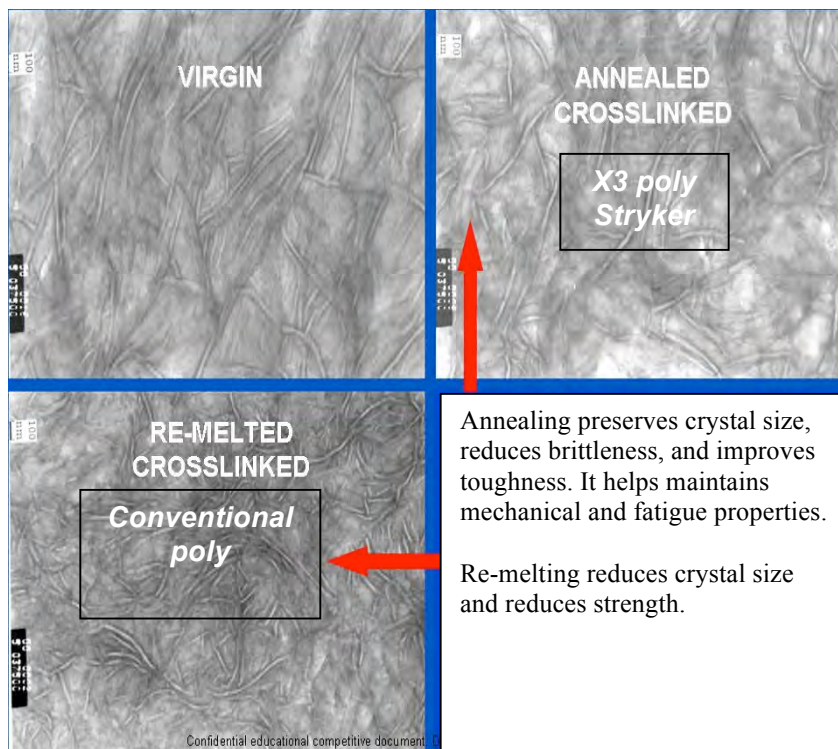
X3 polyethylene

There are over 475,000 knee replacement surgeries performed every year¹, a number that will increase as the baby-boomers age and desire to remain active throughout their retirement years. To meet these demands, new technologies are being researched and developed to improve both the reliability and function of knee implants.

The bearing material used for knee implants must be strong and highly durable, as it is subjected to over 1 million loading cycles per year over the life of the implant. Recently a new patented, highly crosslinked polyethylene called X3 poly (Stryker Orthopaedics) was introduced which performs better than previous materials.

Polyethylene is subject to oxidation, which occurs when the polyethylene is constantly exposed to oxygen in the human knee. The result is that the polyethylene becomes gradually weaker which may compromise the duration of the implant. Stryker researchers have discovered a way to reduce the oxidation of polyethylene through an advanced manufacturing process.

Figure 1. Microscopic views of X3 poly compared to conventional poly. The annealing process used to make X3 helps maintain strength & durability, whereas re-melting processes have resulted in reduced crystal size and strength.



In research testing involving the knee, *X3 poly* has been shown to reduce the wear rate of tibial inserts by up to 79% compared to conventional polyethylene. As a result, *X3* is expected to last considerably longer.

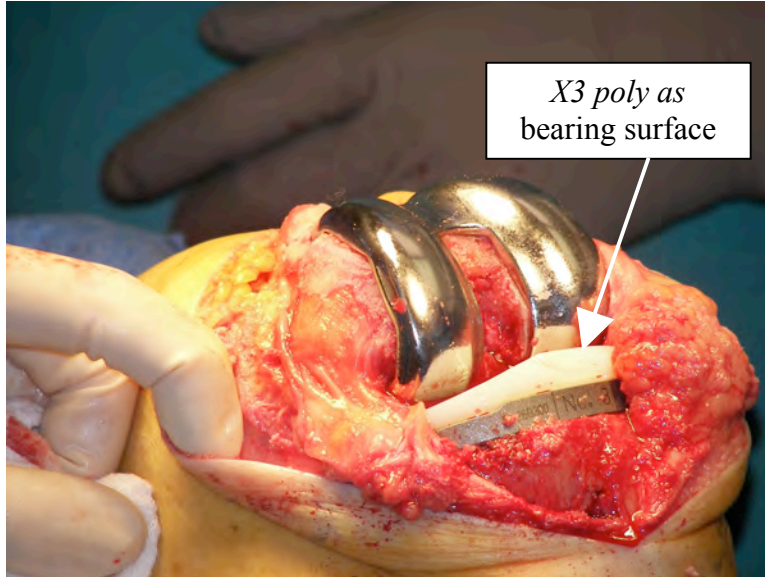


Figure 2. Positioning of *X3 poly* in a patient receiving a Triathlon knee implant (Stryker Orthopaedics).