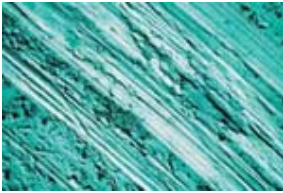


Receiving Inspection and Stretch Rolling



1. Receiving Inspection

Aesculap's quality control department carefully inspects the incoming titanium material. A specimen is then analyzed and tested for strength. The titanium is kept in a so-called "blocked store" until it is released by the quality control department.



2. Stretch Rolling

The titanium alloy is heated and rolled into a conical shape.



Hot Pressing



3. Hot Pressing

In the implant forge, computer-controlled hot pressing of the prosthesis material is monitored. Subsequent precision forging takes place in three stages: bending, rough pressing and finish pressing. The prosthesis is then trimmed (material residues are trimmed off) to give it the correct contour. The second pressing calibrates the prosthesis, thereby

giving it its final shape.



Prosthesis after the Hot Pressing



Milling and Drag Finishing



4. Milling

The production data for the prosthesis is input into the computer-controlled CNC machining center which is then equipped with special tools. Machining is then begun with the press of a button. The CNC machine requires 15 to 20 minutes for production unit. The finished prosthesis is then precisely measured and tested.

Prosthesis after the Milling



Drag Finishing

5. Drag Finishing

Milling leaves a rough surface on the prosthesis. It is smoothed automatically in a grinding machine in which ceramic chips together with a lubricating gel fluid remove the roughness. Drag finishing takes several minutes. Only when all surface values satisfy requirements does the prosthesis move on to the next production phase.

Prosthesis after the Drag Finishing



Cone Machining and Grinding of the Cone Basis



6. Cone Machining

The prosthesis cone must be turned using extreme care because it forms the critical interface to the prosthesis head. This demands the highest degree of machining precision. The CNC lathe gives the prosthesis cone the correct diameter, as well as the necessary roughness and roundness. Every prosthesis is measured in detail. All the production data is then recorded for full documentation purposes. This means the properties of an

implanted prosthesis can be reconstructed even after many years.



Prosthesis after Cone Machining



Grinding of the Cone Basis

7. Grinding of the Cone Basis

The direct transition between prosthesis shaft and prosthesis cone requires a special finish, produced by special hand work.

Plasmapore Coating and Finishing



8. Plasmapore Coating

The so-called plasmapore coating robots coat the top third of the prosthesis shaft by spraying pure titanium powder onto the oxide-free surface of the prosthesis in a vacuum chamber. The titanium powder hits the piece at twice the speed of sound. Upon colliding with the prosthesis, the powder particles burst, thereby forming a rough, microporous surface with high stability - the so-called plasmapore coating. Then come various tests and

measurements, e.g. of thickness, porosity and peel strength of the coat.



Coated Prosthesis Shaft



9. Finishing

The prosthesis then passes through a dulling process to give its other areas the final surface finish. For this it is pre-cleaned ultrasonically and then sprayed with ceramic beads. In the final inspection phase, the prosthesis is subjected to extensive measurement and visual inspection and labeled with a laser beam. The code number is particularly important as it makes it possible to later recount the "biography" of the prosthesis in full

detail.

Final Cleaning, Packaging and Sterilization



10. Final Cleaning and Packaging

Final cleaning of the prosthesis takes place in a continuous washing facility that then leads into a clean room in which workers wear special protective clothing. In the clean room, the prosthesis is packed in its primary and secondary packaging. It is then packed in its outside packaging (master carton) and labeled in a second step outside the clean room.

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11. Sterilization

The hip prosthesis is then sterilized by a company that specializes in the technique of gamma ray sterilization.