

WINS!

WTIA National Diffusion Networks
Project (NDNP) funded by the
Federal and State and Territory
Governments and industry



AusIndustry

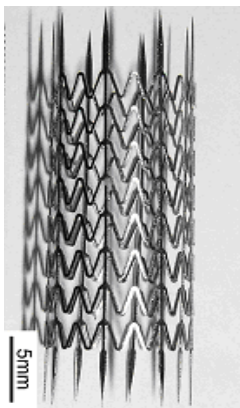
SUCCESS STORY NUMBER 08: ANSTO laser measurement helps keep the life blood pumping – *Proof testing of shape memory NiTiNol aids introduction of vascular stents*

What is a Stent?

A vascular stent is a mesh-like tube, often made of metal, that can expand once it is inserted into a blood vessel. Vascular stents may be placed in either arteries or veins for the treatment of diseases such as coronary artery disease.

NiTiNol in Medical Devices

NiTiNol is used in a vast variety of applications in medical implants and instruments.



The stent acts as a kind of scaffolding for the blood vessel to maintain the lumen of the vessel. Usually, the stent is left in the vessel permanently. Stents may also be used as the basis for a graft to bypass or repair severely diseased vessels.

Its excellent corrosion behaviour, together with extraordinary properties opens significant market opportunities.

As a shape memory alloy, NiTiNol is capable of returning to a previously memorised shape. It has to be deformed while in its low temperature form, martensite and upon subsequent heating transforms to the high temperature form, austenite. A large force is generated during the phase transformation, which has been successfully utilised in the manufacture of stents that need to expand to a required geometry once inserted into an artery.

ANSTO Technology

Through the WTIA's NDNP, Medical Devices and Sensors sector member the Australian Nuclear Science and Technology Organisation (ANSTO) based at Menai in NSW has applied its highly sophisticated laser measurement technology to help local medical device companies accurately quantify the application of NiTiNol in the manufacture of stents.

Laser Dilatometry

This non-contact and highly accurate method measures thermal expansion of materials

accurately in addition to acquiring accurate 3D shape of specimen at elevated temperatures.



ANSTO's laser dilatometer system



Stent shadow while being laser scanned

An analysis of the thermal dilation behaviour of NiTiNol shape memory alloy stents was conducted by ANSTO over the temperature range -10°C to $+40^{\circ}\text{C}$.

NSW Industry Leads the Way

AllVascular Pty Ltd, based in St Leonards, NSW, recently acquired local SME Droneon Pty Ltd and are utilising the results of laser dilatometry proof-testing undertaken by ANSTO for the company to expand their medical valve device business into the manufacture of stents.

AllVascular is an innovative company whose corporate focus is on marketing and selling unique, restorative, medical devices into under developed markets. The company thrives on problem solving and turning ideas into products and typifies the thriving medical devices industry in NSW. This sector, and the WTIA's NDNP are actively supported through the Department of State and Regional Development (DSRD).

The results of ANSTO's work will contribute to AllVascular's technological edge and help to maintain NSW as one of the leaders in medical device technology. The outcome – better health care for everyday Australians.

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