3D one

High quality, Accurate, Patient Specific or Library set, Radiation Shielding

Varian & Elekta Compatible

eCutout

- NonToxic
- Tungsten Carbide material
- Patient specific capabilities
- Reclaimable & Recyclable

Lead Alternative Shield

Utilising advanced 3D Design and CNC capabilities, 3D One has been able to develop a streamlined, processes that create a precise, customised shield that allows Healthcare Professionals to deliver accurately contoured electron radiation therapy whilst minimising exposure to healthy tissue. TTungsten Carbide has equivalent electron shielding performance to lead, but is non-toxic and able to be physically handled, as well as being reclaimable. The 3D One eCutout is a vendor specific (Elekta or Varian) electron therapy shield, consisting of a 3D printed plastic frame filled with a proprietary Tungsten Carbide composite, incorporating a high precision waterjet cut aperture. 3D-One provides on-demand custom-designed eCutouts, efficiently and rapidly via its online orders portal, where clinical centres can upload patient-specific treatment aperture profiles, as well as optionally use of the purposely designed GUI for offset, labelling and orientating purposes.

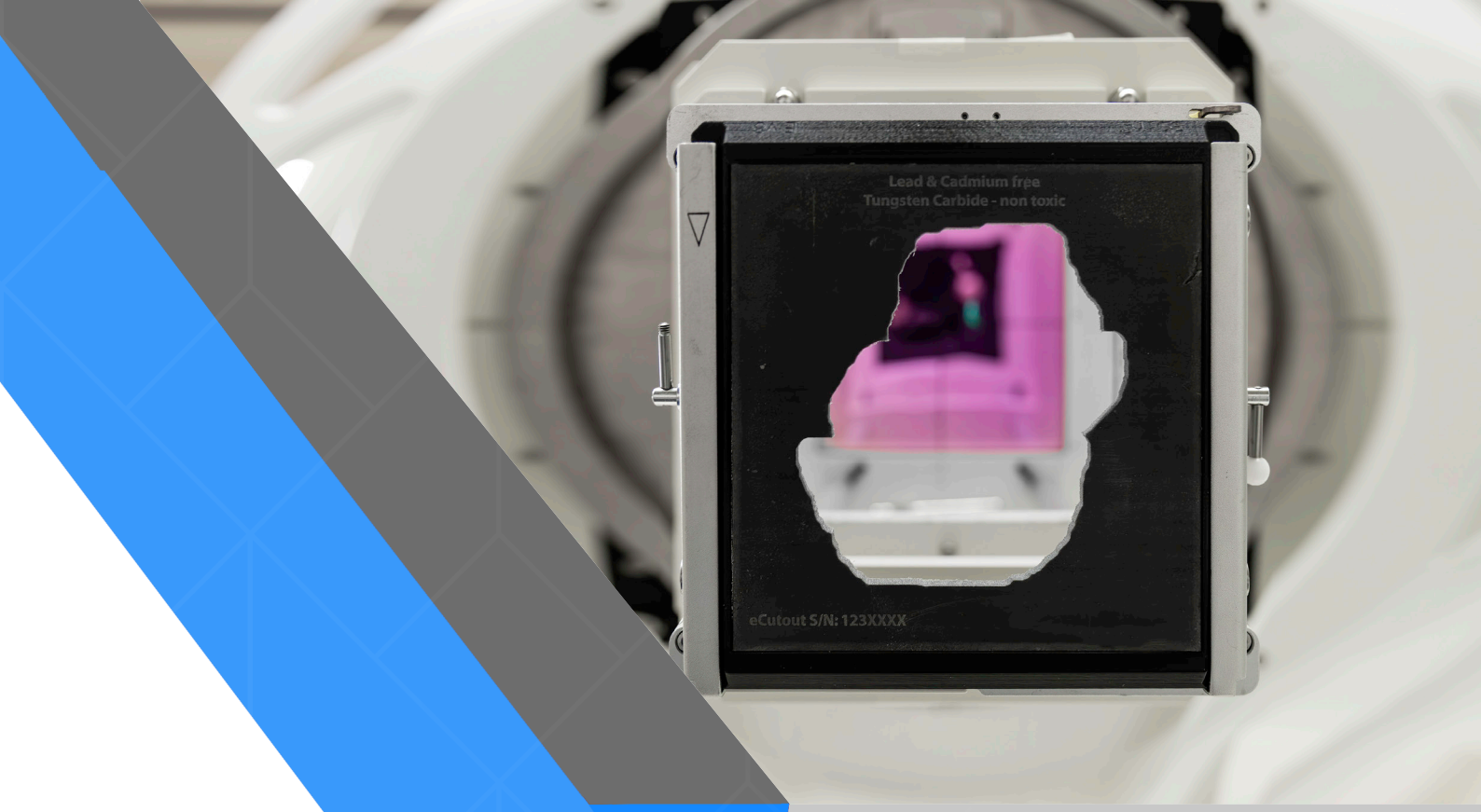
Tungsten Carbide Powder

Introduction

To ensure that the 3D One eCutout was as effective, as it was innovative, it needed to be capable of replacing the long-standing method of radiation shielding, which uses toxic, low melting point alloys (LMPA) like Cerrobend.

Clinical Validation

The 3D One R&D team, undertook extensive preclinical testing and trials at the Radiation Oncology Mater Centre in Brisbane Australia. Dosimetry of the 3D One eCutout was characterised by measuring transmission, relative dosimetry (percentage depth doses and profiles) and insert factors for all electron energies (6, 9 , 12, 15, 18 MeV) at both 100cm and 110cm Source to Surface Distance (SSD) on a Varian Clinac iX for a range of square cut-out Dimensions (3cm-25cm). The transmission test showed the 3D One eCutout attenuating material is equivalent of the LMPA for 6-18 MeV to within ± 0.5%. Most importantly, it was clear that, dosimetrically, the 3D One eCutout could be used as an alternative to LMPA.



Clinical Use

In stark contrast, the 3D One eCutout uses non-lead radiation shielding powder in a 3D printed frame which fits into a specific LINAC applicator. This change in block out material combined with the use of 3D printed, Biodegradable Poly-Lactic acid (PLA) plastic frames means that the 3D One eCutout shield is non-toxic to personnel, patient's and environmentally recyclable.

Lead & Cadmium Free

Existing shield devices most commonly use LMPA electron block material, which is toxic and hazardous. The use of lead containing materials at room temperature, let alone melting point, is a serious health concern for the hospital workers and patients when it is placed onto radiotherapy machines for patient treatment. Special rooms and handling procedures have been developed to manage the risk but this comes at a high operating cost to the hospitals. Unfortunately, this does not eliminate the risk as lead is still toxic even in final form ready for use. 3D One has utilised a manufacturing process which is rigorously tested and is guaranteed 100% lead and cadmium free.

R&D

3D One has invested over $1 Million in R&D specifically to design an environmentally friendly material that can be used as a replacement for LMPA traditionally used within the Varian and Elekta LINACS.

Lead Time

3D One's advanced technology allows for **same day despatch** on orders placed before 9am.

eCutout Unique Features

- A Superior alternative to traditional lead radiation shield devices
- Laser etched labelling
- Non-hazardous
- Superficial & Orthovoltage use
- Improved accuracy of all eCutout water jet cut apertures
- Significant reduction in preparation time
- Environmentally friendly

1) Vedang Vyas, Lisa Palmer, Ray Mudge, et al. On bolus for megavoltage photon and electron radiation therapy Medical Dosimetry 38 (2013) 268–273
2) Yizhou Zhao, Kathryn Moran, Mammo Yewondwossen, Clinical applications of 3-dimensional printing in radiation therapy. Medical Dosimetry 42 (2017) 150–155
3) Burleson S, Baker J, Hsia AT, et al. Use of 3D printers to create a patient-specific 3D bolus for external beam therapy. J Appl Clin Med Phys. 2015;16:166–178
4) Park S-Y, Choi CH, Park JM, et al. A Patient-Specific Polylactic Acid Bolus Made by a 3D Printer for Breast Cancer Radiation Therapy. Deutsch E, ed. PLoS ONE. 2016;11:e0168063.
5) Robar James L., Moran Kathryn, Allan James, Clancey James, Joseph Tami, Chytyk-Praznik Krista, MacDonald R. Lee, Lincoln John, Sadeghi Parisa, Rutledge Robert, Intra-patient study comparing 3D printed bolus versus standard vinyl gel sheet bolus for postmastectomy chest wall radiation therapy, Practical Radiation Oncology (2017)
6) A. Dubey, A.M. Sharma, D. Sasaki, et al. Perception and Time Effectiveness of Utilizing 3D Printer Technology to Create Rigid Bolus for Radiation Therapy. Int J Radiat Oncol Biol Phys 2017 99;2:413-414

Testimonials

"We recently investigated and then commissioned 3D One's Electron cutouts for use with our Elekta machines. The team was excited to have an option which would remove our need for a mould room and the cutouts meet all our expectations. They interfaced well with the linacs, were dosimetrically equivalent to the Cerrobend cutouts we have traditionally used, and were appreciated by the RT's for their easy handling. Throughout the commissioning process, the team at 3D One were always extremely responsive and helpful to our requests. They adjusted their online ordering process to ensure the ordering fit with our local systems and dealt with any issues we had in a positive and constructive manner."
- Christchurch Hospital, New Zealand

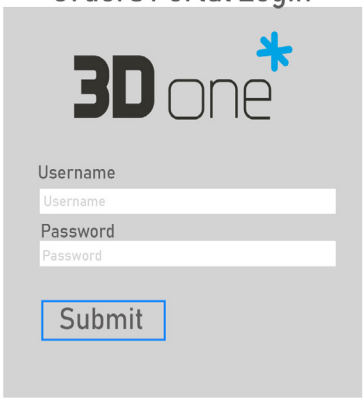
"The team at 3D One actively engage in customising their products to our departmental needs. They show eagerness in investigating improvements and thoughtful design modifications are offered frequently. Exciting things have been made possible for us!"
- Waikato Hospital, New Zealand

Technical Specifications

Density (g/cc)	> 9 (Equivalent to LMPA)
Size (cm)	**Varian:** 6x6, 10x10, 15x15, 20x20, 25x25 **Elekta:** 6x6, 10x10, 14x14, 20x20, 25x25
Working Temp (°C)	< 50 °C
Materials	Tungsten Carbide Polylactic Acid

ARTG Registeration no: 299710

Orders Portal Login



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Our unique Orders Portal https://3d1orders.com.au/ allows our registered clients to upload paitents redacted files in various formats such as .DAT, .CSV, .STL or .DCM