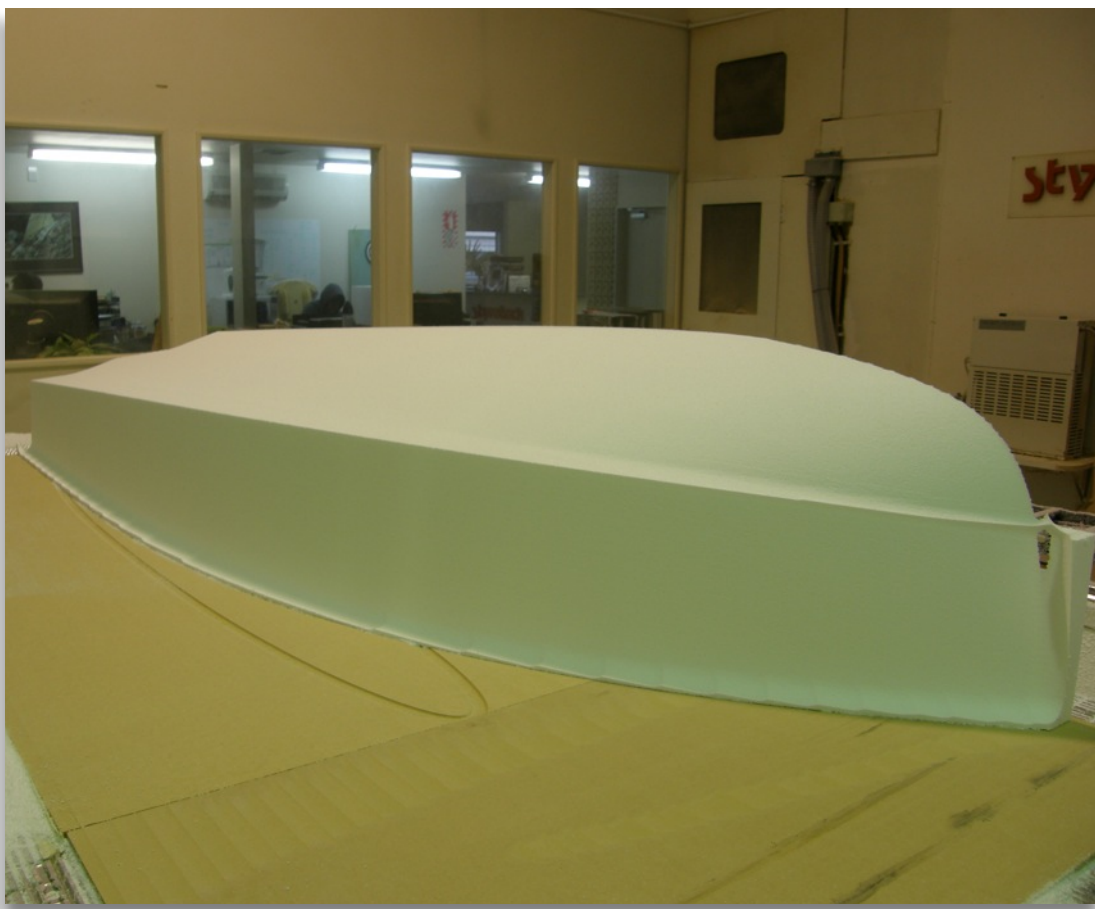


Styrotech CNC has the experience and ability to undertake a wide range of precision cutting and machining projects. Whether it's precision profile cutting of MDF, Plywood, or another type of wood, plastic or foam, or the design and cutting of intricate organic shapes, engraving, the manufacture of a complex geometric structure or your specific requirements, Styrotech CNC Ltd. have forged a name as industry leaders for contract CNC services.



## Winter 2014

**Geometry is the quarterly newsletter from Styrotech CNC. It gives an overview of what's happening at Styrotech, a look at some of the work we've done and how what we've done might apply to your next project.**

In this issue, we've an overview of how the combination of different technology platforms (namely CNC machining and 3D scanning) can combine to create innovative solutions across different industries, from boat building to art, design and restoration.

In this case, we're talking about combining 3D Scanning with CNC machining, and how this can be applied to different scenarios. We often work with FormScan 3D to achieve these outcomes - the bottom of page 5 outlines

how you can get in touch with FormScan 3D to discuss how they can help.

As well as this there's an overview of some of the interesting work we have recently completed, including cutting large statues from polystyrene, different moulds for a variety of applications including maritime, specifically a mould for an OC290 tender (picture above).

For more details on this, and other projects, please have a look at page 4.

Rounding off this issue of Geometry is a short summary of some breaking news here at Styrotech CNC - the introduction of a new CNC machine from Italy, details of our website and Facebook page, and contact details for FormScan 3D.

### Software Partners:

**alphacam**

**SolidWorks**

**rapidForm XOS**  
scan

**FORMSYS**  
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*Main image:*  
The newly restored  
stern of the  
*Ngataringa*, sitting at  
mooring with several  
other classic yachts.

*Inset:*  
*Ngataringa.*

## End-to-end solutions: Accurate, timely and cost-effective.

**Regular users of CNC machining and digital scanning are not always aware of the range of 'end-to-end' solutions possible through the combination of 3D scanning and CNC machining.**

By working together, it's possible to combine the strengths of each service such that the complete service offers more value than the sum of its parts. To give you an idea of what's possible, here are some examples of the range of work we have done, and a case-study highlighting what can be done in the field of restoration.

**ARTISTS and DESIGNERS** use FormScan 3D and Styrotech CNC to help turn their concepts into a reality. Starting with an idea, a prototype is designed and created (i.e. carved) with few limits as to what

can be done with its shape. Once satisfied with the 'look', the prototype is then scanned by FormScan 3D, thus creating a 'master' CAD file. The master CAD file can then be further modified prior to arriving at a final design.

Using the finalised CAD file, Styrotech CNC can then use this to re-create the object in virtually any form from wide range of materials depending on customer requirements.

Using this process as a guideline makes it possible to **commercialise** an idea **quickly, accurately** and **cost effectively**.

**BOAT BUILDERS** often use 3D scanning to verify the accuracy of a job against its original design, and use 3D scanning as a design tool for 'subsequent' parts.

**Below left:**

This is the damaged transom of the *Ngataringa*. Half of the original piece has been reconstructed (the grey area) so it can provide a basis for the 3D scan and CAD modelling.

**Top right:**

This is one view of the finished CAD model of the transom. Looking aft and down on the transom, the model was developed from the scan of the original stern.

**Opposite right:**

This is the newly machined transom that was installed on the *Ngataringa*. Cut from a large block of Kauri, the 'new' part matches the original as exactly as possible. The new stern is viewed from the underside.

By 'subsequent' parts, I mean those that will be installed inside a hull. 3D scanning **economises** this entire process as the 'subsequent' parts can be designed and made to precisely fit the location they are going to be used, reducing the amount of time needed for installation as the parts have been 'made to fit'.

In addition to marine, this technique is used extensively in the automotive and aerospace industries. For example, the components installed in V8 Super Cars (racing cars) are designed in this way.

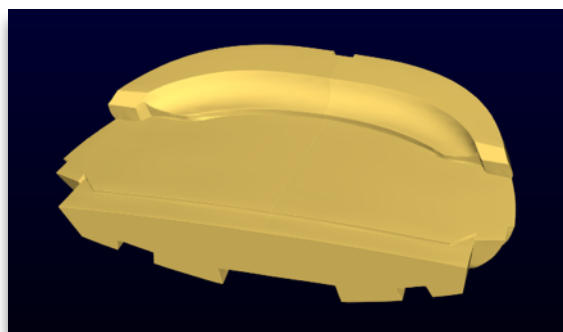
Scanning and CNC machining are often used together in **RESTORATION**. A good example of this was the construction of a new transom for the 1939 'A' class yacht, *Ngataringa*.

The challenge was that the original transom had been extensively damaged (see picture below), and large parts of it simply weren't there. Plans did not exist, so 3D scanning provided a means to create a new stern reflecting the original design.



The solution was to remove the damaged transom, measure *Ngataringa* and then restore, as best as possible, one side of the original transom using undamaged sections as a guide. The original transom was then bought to FormScan 3D, who 3D scanned it thus creating a digital starting point. FormScan then CAD modelled a new transom that would reflect the original design of *Ngataringa*, and fit the original stern.

Once finalised, the CAD file (see image below) was passed to Styrotech CNC, who machined a new transom using the original material, Kauri.



The completed transom (see image below) was matched up with and attached to the rebuilt stern of *Ngataringa*.



In a similar way to boat builders using these technologies, this process can be used to make **moulds** for different applications, particularly where it's important that the parts made using the mould fit exactly into a given space or as one of an assembly of parts.

These examples demonstrate some of the possible 'real-world' outcomes of combining 3D scanning and CNC machining. The process can not only create a **solution**, but a **cost effective**, **efficient** and **accurate** one that will **improve the overall quality** of the job, **provide CAD that can be used for future projects** and improve the **efficiency**, and **hence profitability** of your team.

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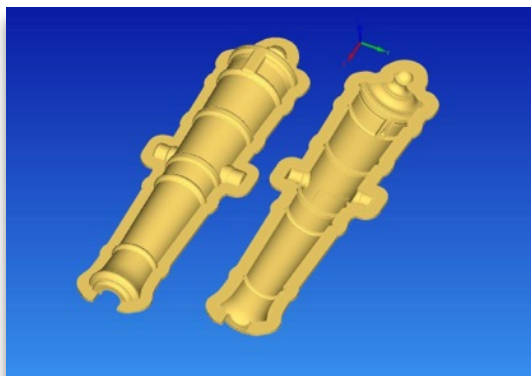
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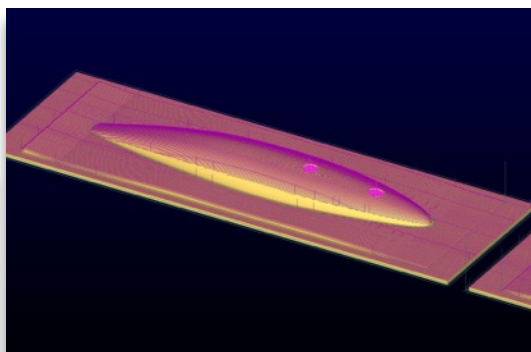


# Recent Jobs at Styrotech CNC ...

We've been fortunate enough to work on some really interesting projects over the last few months. Here's a bit of a snapshot...



Using supplied CAD, we cut a mould for a 17th century cannon. The mould's going to be used to make rotational moulded cannons, in plastic, so this is a UMDf mould for a casting that'll be used to make a male mould.



**Top left:**  
CAD image of the 17th century cannon.

**Middle/bottom left:**  
CAD image of the keel bulb from a VX-1. This was what was used to cut the keel mould using UMDf.

**Inset bottom left:**  
This is the cast lead keel bulb, made using the bulb as machined by Styrotech CNC.

**Top right:**  
This is the CAD model used to cut the mould for the OC290.

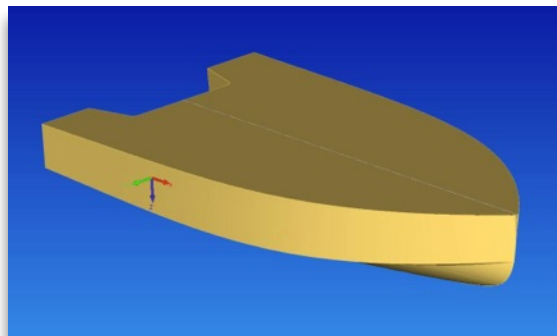
**Far right, upper:**  
One of several male moulds for kayaks.

**Far right, lower:**  
The 3.5m statue of King Joffrey.

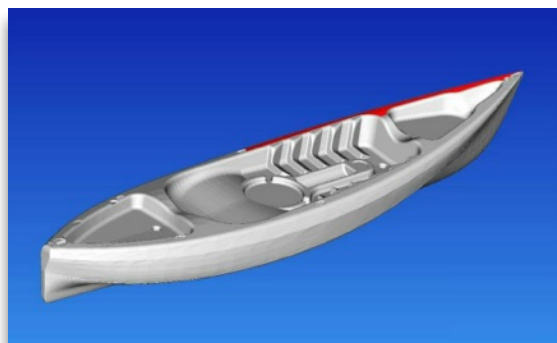
**Bottom right:**  
CAD drawing of the hull of the SS Wairarapa. This was used to CNC cut the male mould for the casting.



in one-design boat manufacture, this is incredibly important as maintaining the integrity of the one-design class.



Staying with marine, we recently cut the mould for an OC290. An OC290 is a small tender for use with offshore cruising boats.

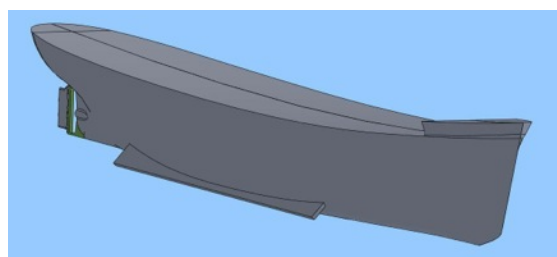


We've made some moulds for kayaks...



... and a 3.5m statue of King Joffrey (Game of Thrones). The statue was used in the promotion of the new series, launched in April 2014.

And last up is a scale model of the SS Wairarapa, CNC cut using a CAD model based on original drawings.



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## New CNC machine

Increasing demand for services from Styrotech CNC has meant we're evaluating the purchase of a new 3-axis CNC machine (pictured at right).

Manufactured in Italy by SCM (our current supplier), this machine offers quicker code processing speeds and machining times, as well as a wider range of tools that can be used.

This machine can do more, faster and more economically... stay tuned for more details.



## Check out our Facebook Page!

With two – three weekly updates, the number of people who have taken an interest in our page is continuing to grow.

Check it out – it's a good was to stay tuned in to what we're up to, and how some of the work we do might apply to your next project.

So if you're looking for up to date information on what's happening at Styrotech CNC, check out our Facebook page ([www/facebook.com/styrotech](http://www/facebook.com/styrotech)).

## FormScan 3D

FormScan 3D is New Zealand's leading provider of 3D Scanning for Engineering, Inspection and creating CAD Data. Styrotech CNC works closely with FormScan in order to help bring to reality a wide range of projects.

The website has an interesting portfolio of the work that FormScan has done, including projects that were completed in conjunction with Styrotech CNC.

To learn more about FormScan 3D, the work they do and how they can help you with your next project, check out the website ([www.formscan3d.co.nz](http://www.formscan3d.co.nz)), or the Facebook page ([facebook.com/formscan3d](http://facebook.com/formscan3d)).



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