

One stop shopping

The Torielli company has been a noted innovator ever since it was founded by Pietro Torielli Snr. in 1924. This continued under his son also named Pietro who was to become a leading figure in the global footwear industry. It was he who expanded the company into a major shoe machinery supplier with branch offices all over the world. In 1985, his son Giovanni joined the company to continue the tradition.

In 1989, the company joined UK company C&J Clark in the Shoemaster project to develop CadCam software for footwear manufacture. This ultimately led to the forming of CSM3D International Ltd. which Torielli acquired completely in 2004 in order to strengthen its position in the vital CadCam technology field. CSM3D is headed by Ian Paris, an Englishman who had been running Shoemaster for Clarks. The company was now able to concentrate more than ever in developing new CadCam, PDM systems, automatic cutting, production planning and control systems to meet the growing demand for Integrated design and production systems and technologies that increased flexibility and cost reduction.

LOSS AND REGENERATION

Then, in December 2013, Pietro Torielli unexpectedly died. This was a severe shock to both the Torielli family and the company itself as, while no longer active in day-to-day operations, he had remained an inspirational and much loved guiding figurehead. Fortunately, he left behind him a strong, resilient and well-managed company which, after the initial trauma had eased, has been pushing forward under Giovanni Torielli and Ian Paris with an ambitious development programme with which both Pietro and his father would have been pleased.

The company is regenerating itself through investment and the introduction of new personnel to complement existing expertise, and has appointed new distributors and management teams in the main shoe producing areas.



Torielli's modular conveyor can be quickly altered for different types of footwear.

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The main offices at Vigevano are being refurbished and modernised into a high-tech office space complete with a 'virtual receptionist' and new demonstration facilities. The management team has also been further strengthened by Franco Cappiello, an experienced entrepreneur close to the Torielli family, who has now taken on the role of CEO of the group.

LEATHER CUTTING

Computerised leather cutting has become a standard requirement for

today's modern factory, offering improvements in material consumption, consistency of results and reducing the operator skills involved. Always innovators, Torielli has long been at the leading edge of this technology and has now introduced further improvements and innovative solutions. Among these are NestorSC (sample cutting), NestorSR (small production runs) and NestorPC (full production cutting). These are further enhanced by offline nesting systems, automatic and manual nesting solutions for both leather and synthetics.



NestorPC LM 1600 cutting table.

Alongside a long standing collaboration as an OEM for Zund Cutting systems (Torielli add software and projection systems to the Zund cutters), Torielli has now become a producer of leather cutting tables in its own right, with these all designed, engineered and manufactured entirely in Italy. They include the NestorPC LM1600 cutting solution launched earlier this year. It is the first cutting table in the shoe industry to use contact-less linear motors (the same technology used by high-speed Japanese passenger trains). One big advantage with contact-less linear motors is that they do not need the maintenance required by tables based on contact motors. In addition, the high acceleration and control of the speed of the cutters ensures that a premium quality of cutting can be controlled at maximum performance from very fine materials through to robust ones. The system also has an optional laser projection system and is flexible in configuration for use by one or two operators and also for switching between leather cutting, synthetic sheets or rolls of synthetic materials.

INTEGRATED CAD

On the CAD side, there has been much talk in the past in regard to integrated solutions from design to production. While this has previously been something of a pipe-dream, it has now become a reality and companies can now have the luxury of installing a partial solution knowing that if they add to that solution at a later stage they can be confident that all the systems involved will be totally integrated. The process covers components, design, engineering, production planning (material consumption, product costing, technical sheets), leather and synthetic cutting, shoe production (stock control, shoe ordering, production control) and logistics.

Components – suppliers of heels, soles and lasts are now CAD users and are able to supply not just physical products but the CAD data associated with those products.

Design – on the design side, there is a real push within the industry to embrace the use of virtual models and 3D printing. Whilst this will not replace physical samples entirely, it will certainly significantly reduce the overall number of samples and to speed up the development process. In addition, designers are also able to try out more variations of designs.

Shoemaster Creative is a software tool that bridges the gap between creative design and the industrial engineering of the product and allows designers to create their design ideas in whatever way they want using the following design methods:

- Draw (import hand drawn sketches)
- Photo (import photo of prototype shoe)
- Scan (scan a design drawn on a last)
- Illustrate (use a drawing package e.g. Photoshop, Corel Draw to sketch on a last)
- Sketch (use Shoemaster sketching tools to sketch on a last)
- Create (add 2D/3D lines using CAD splines)

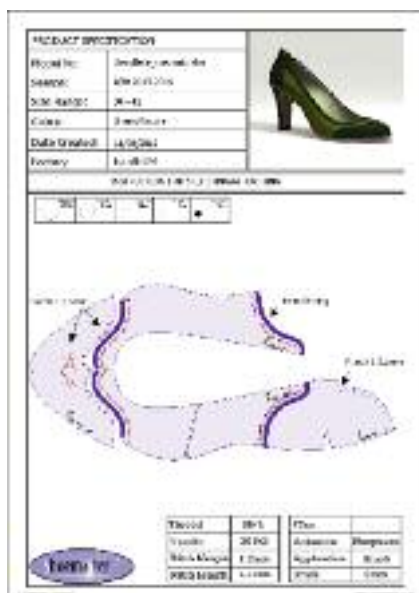
These design methods are combined to create 'What you see is what you get' CAD data which ensures that sample or production shoes are exactly as designed in Creative. The designer is able to verify within Creative that everything is correct before any physical shoes are made. The tool also allows designers to experiment with more variations of their designs, creating virtual models to:

- Try a different last
- Change the toe shapes of lasts
- Apply different material colours and textures
- Use different components such as buckles, eyelets, etc.
- Try different sole types
- Try different heel heights and heel designs

Creative ensures that fewer physical samples are required and that 3D printed prototypes can also be produced where necessary. The designer/engineer interface is made



Creative produces virtual samples that can be adjusted by the designer if required, saving the time and expense of multiple physical ones.



Technical sheets such as this one for stitching a ladies upper can be generated from the original Creative data.

complete as any style changes required for engineering purposes can be immediately seen by the designer before sample or production shoes are made.

Engineering – historically, ShoeCAD has traditionally been in 2D but, once again, there is a drive towards 3D systems to ensure the fidelity of links with design and to also store skills within the systems that are traditionally understood and unwritten by the most experienced shoemakers within a company. The latter aspect is an extremely valuable asset in regard to increasing overall employee knowledge and skills.

The 3D CAD system Shoemaster Power starts by scanning the chosen lasts or receiving e-lasts from the last maker. Alternatively, the last and shoe design can be received from Shoemaster Creative. The process then covers last flattening, pattern engineering and grading as well as the development of 2D tooling such as stitching palettes, assembly jigs etc. Computerised last flattening systems have improved dramatically in recent years from the basic flattening systems found in the early CAD systems to comprehensive ones that include different methods for various last shapes and shoe constructions.

Production planning – although CAD data by itself is very useful for

production needs, more information is needed for the modern shoe factory. The process of calculating materials consumption and estimating production costs has not only been simplified but, as Shoemaster Quantum is integrated with design/engineering, it is possible to quickly try out changes in design to determine if costs can be optimised or even to see if design enhancements or usage of particular materials will meet the production budget.

Technical sheets, providing instructions on how to assemble parts of the shoe, are another essential part of the process. Shoemaster Techspec allows these sheets to be created from the CAD data as well as pre-stored libraries of shoemaking instructions, data tables, symbols and logos. A major benefit of this CAD integration is that any changes to the design or construction of the shoe can lead to automatic updating of the sheets. This is true integration.

Factory production – at this stage, the CAD has supplied all that is needed to allow a factory to produce shoes. Now the factory itself has to organise its own functioning. This can now be integrated through Enterprise Resource Planning (ERP) systems. In 2015, Torielli has launched Shoemaster ERP that has some major advantages over many standard ERP systems. It has been specifically designed for the shoe, components and leather goods industries, is easier to understand and, also comes at a much lower cost. It covers four main areas:

- Pre-production data population (import of CAD data, material warehouse stocking and production bill of materials (BOM))
- Ordering system (web-based ordering to allow shoe buyers and factories to confirm order details)
- Production management (work tickets, technical instructions, supplier orders, warehouse management, assembly line WIP management, etc.)
- Logistics (packing, labelling, invoicing, dispatch)

There is also some innovative hardware that can be used to take maximum advantage of the ERP system in the form of a new conveyor

distribution system. Modular in concept it gives the flexibility to quickly change configurations to optimise the factory depending on the next type of shoe to be produced. The transporter is equipped with detection systems and a management control system, that can show in real time the location of jobs in progress and the progression through the line.

ONE STOP SHOP

Torielli has indeed now become a 'one-stop' shop in CAD terms with products available for a complete integrated solution from design right through to final delivery. To further enhance this ability, the company has also opened a new consultancy division, Torielli Engineering. The TE Division is able to advise clients on choosing the best solution for their particular needs and to then assist them with the actual implementation. It has many engineers on its books who can be placed into factories to offer support during the implementation phase.

Building on the years of experience within Torielli, TE Division has been filled with even more shoe production specialists. This will enable it to provide a world class consultancy and advisory service for all types of production, from selection of machines to organising factory production lines and supplying specialist technicians. It can also offer advice on the practicability of new projects, an analysis of existing enterprises, design and set up of units, organisation of complete production lines and pre- and post-sales technical assistance. The long term aim is to provide an increasingly comprehensive consultancy service for footwear manufacturers worldwide who can benefit from Torielli's technical knowledge and wide experience gained over its many years in the industry.

The global footwear industry continues to grow as demand continues to increase with the rise in both populations and living standards. It is also becoming ever more efficient and cost conscious so the arrival of a totally integrated CAD system is welcome news as it can help manufacturers in many ways, particularly relative newcomers to the industry. The fact that it comes from a such a long established and well respected supplier can only give them greater confidence. 🍀