

Autodesk® Inventor™ Software for World Leading Dairy Milking Systems

Established in 1968 by Ned Harty, Dairymaster is still a family-owned business now in its second generation under Dr Edmond Harty. From its production plant in Causeway, Co. Kerry it now exports its branded range of milking and feeding equipment for dairy farms to 38 countries including Australia, Japan and North America as well as Europe from the UK to Russia. Employing 170 people at its manufacturing plant, Dairymaster also has branches in Britain, a market it entered in 1990, and the USA where it has been particularly successful in recent years.

Dairymaster enjoys a market share of over 70% for all new milking parlours and associated equipment on the island of Ireland and exports over 60% of its entire production. It is recognised as a world leader in the development, design and manufacture of milking equipment and its products are all made to the ISO standards for milking equipment (ISO 5707, 3918, 6690). In fact Dr Edmond Harty has been involved for some years in the defining of relevant ISO standards.

The wide range of Dairymaster products today includes the core products SwiftfloRevolver, a range of rotary automatic milking parlours, as well as automatic feeding systems, scraper and washer systems and a series of automated and computer-controlled systems for all aspects of dairy herd milking management and milk production monitoring. "We have a massive commitment to research and development," says Edmond Harty, "both in terms of expenditure and proportion of management time and resources. If there is a 'secret' to Dairymaster's world-wide success it is that unfaltering commitment to ongoing R&D in our sector which has enabled us to make some pioneering advances in several areas as well as continuously improving our product quality."

It is all focused on improving the performance of the basic milking process for the herd owners, he points out. "If milking times can be improved by even a minute or the milk yield raised by a small amount, that has a significant bottom line impact for the owner. We have been able to prove, for example, that our systems can raise the milk yield by up to five per cent compared to our competitors. That is quite a lot over time, especially for say our big Texas customer which milks over 2,600 cows three times a day to produce 95,000 litres!"

Dairymaster production is probably unique in that it manufactures almost all of the specialist components in its systems. There are over 600 injection moulded parts in the product range, for example, while other technologies deployed in the Causeway plant include printed circuit board (PCB) design and production as well as fabrication and assembly. Materials include stainless and mild steel, aluminium, brass, rubber and polymers while electronic assembly involves over 50 different PCBs and 25 microprocessor-based circuits. A single large milking parlour could have several thousand separate component parts. The scale and range of the components involved is illustrated by the fact that the Dairymaster production and spares stock range extends to over 500,000 items.

"We have been Autodesk software users since the late 80s and the days of DOS, moving forward with the product generations," recalls David Brent, the company's design engineer. "We moved to 3D design early this decade with Autodesk® Mechanical Desktop™ and then on to Autodesk Inventor about five years ago. There are still lots of uses for AutoCAD around the plant, in profile and assembly specifications for example. It is also our tool for the 800 or so milking parlour layouts we draw up for our individual customers every year based on site surveys by our field sales staff."

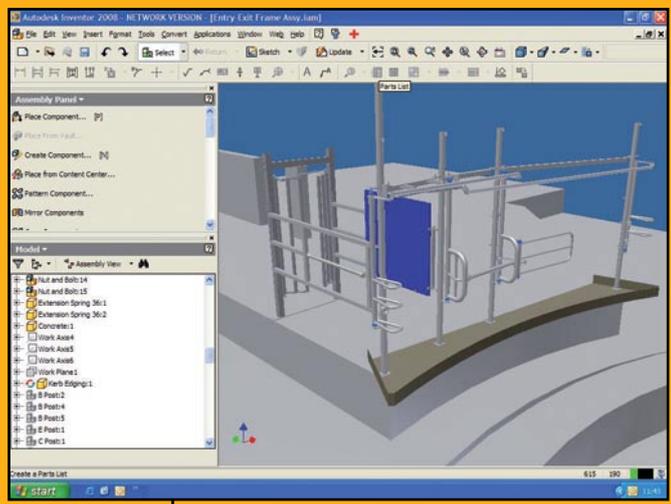
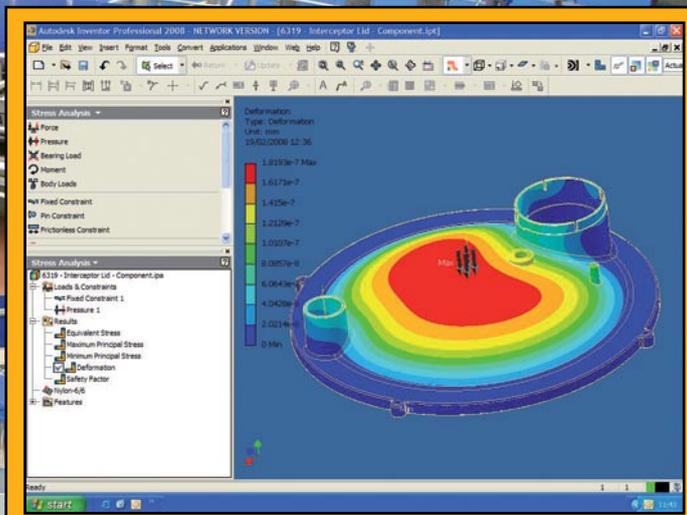
But Autodesk® Inventor™ Professional software, is firmly at the centre of Dairymaster's programme of continuous product development as well as new product design. Five of the 12 design engineers are direct users of Inventor, working on perhaps 2000 or so separate elements of the company's current product range. "Take just our injection moulded products: we design and produce tools for about 40 new parts every year," David Brent says. "In this process of continuous product development there is no question that Inventor has speeded up the whole cycle significantly—although it would be hard at this stage to say by how much exactly because it has long become so central to the way we work on the design side. High quality, realistic visualisation is highly valuable for everyone in the process from the design engineers to other staff and even customers."

Looking at product assembly, form and fit on screen is now taken for granted as an integral part of the design process with the hugely important benefit of collision detection on-screen at the earliest possible stage. "What we do in our design process is essentially digital prototyping, with all of the time and costs savings that suggests. While we are for the most part working from existing product designs, the revisions are all geared towards better performance or efficiency in the operation of the products or contributing to improvements of some kind in the manufacturing. The company's growth and continued success depends on both of those quality strands, so it would be hard to exaggerate the importance of being able to get things right at the design stage through the capabilities of Inventor."





Swiftflo Revolver Rotary milking parlour



Because of the wide range of production resources it already has in-house, Dairymaster usually progresses quickly from the initial design phase to rapid prototyping on the factory floor. "That process too has been speeded up, because for prototypes or for standard production we can output CAD/CAM instructions for toolmaking, machining or milling from Inventor. Our Autodesk software is fully integrated with specialist systems such as Delcam Powermill and Featurecam." It also ties in with the electronics design process, David Brent explains: "We can take the mechanical elements of the PCB design into Inventor to produce or verify important details involving, for example, the shape and mounting of the board. Ensuring that PCB mounting holes line up correctly with their mount points is the kind of detail that can cause huge problems when things are wrong!"

He stresses also the sheer breadth of the tasks in Dairymaster's product design, development and manufacturing that have been taken into Inventor. From the design of plastic mouldings and the mould tools to produce them to the use of stress analysis in part design, almost all aspects of the company's commitment to continuous product development are in fact carried on through Inventor. In addition to the importance of 3D at the design stage, Inventor also carries through to production floor with the output of 2D manufacture and assembly drawings and of course machine instructions through the CAD/CAM systems.

"We find Inventor very smart also in producing the many installation and user operation manuals required for our products," Edmond Harty adds. "Producing variations for clarity such as views from different sides or exploded diagrams is particularly easy to do and very useful. In 3D, the presentation capabilities of Inventor are outstanding for discussions with colleagues or external experts, staff training and screen demonstration to customers. We can even animate aspects of the computer model to show exactly how specific elements of the milking systems work."

All in all, Inventor has become almost the engine of R&D and creative product evolution in this dynamic Irish company, which is exporting complex electromechanical and electronic machinery around the world into specialists and competitive dairy industry markets from a small village on the Atlantic coast of Kerry.

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Autodesk Inventor was provided by Autodesk Reseller, Procad Software