Grant Engineering - Innovation and Excellence in Heating Solutions

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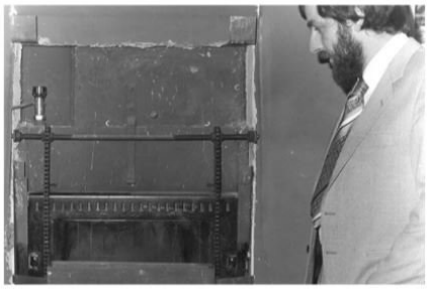
Grant is Ireland's leading developer and supplier of home heating technologies, and has been providing innovative, efficient, reliable and energy saving home heating solutions for over 40 years.

Four Decades of Innovation

The company was founded in 1978 by Stephen Grant, bringing to market the innovative "Grant Hydrogate Back Boiler", a high efficiency back boiler for an open fire. The back boilers by Grant was developed at night in his garage and fitted by day during his plumbing business. Grants first technology success was a squared single fl ue back boiler with a 7" opening to the rear suitable for burning peat, wood or coal.

The technology of the back boiler soon progressed from 7" to 16" opening with a twin flue. It came at a great time as oil fired heating was the norm, but oil became expensive or unavailable. This product suited the climate of the time because consumers could get solid fuel reasonably cheap, with being in the midlands where bogs and turf was readily available. This was the culture of the customers need during the late 70s. This was also the basis behind the company for Grant in providing efficient affordable home heating products for consumers.

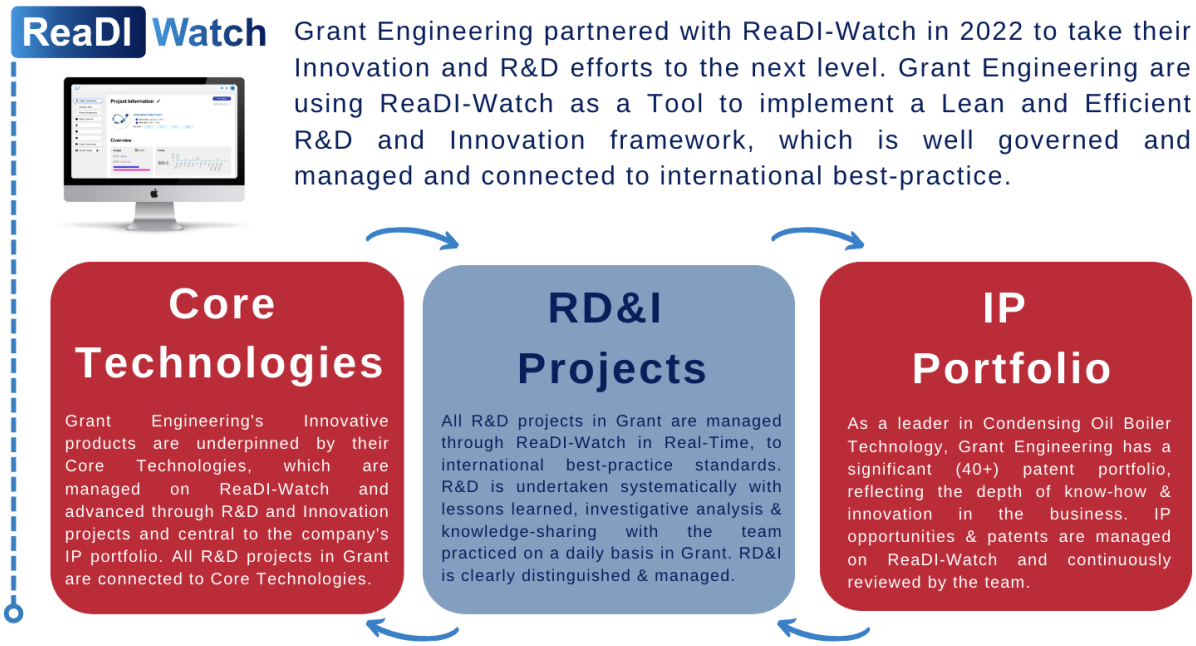


Fast forward to today, the EY Entrepreneur of the Year Stephen Grant leads the company across two key innovation centres; its headquarters in Birr, Co. Offaly, Ireland, and in Swindon, Wiltshire, UK. Grant opened the doors of their €14 million state-of-the-art facilities featuring an R&D innovation centre in Birr, Co. Offaly in 2021., and its newest 80,000 sq ft. facilities based in Swindon, Wiltshire in 2022/2023.

"Innovation is the cornerstone of Grant's success. We grow by being first with the innovative products, solutions and services that are valued by our customers. Our employees pursue ingenious solutions in their roles and responsibilities." **- Stephen Grant, Founder**

Grant Engineering and ReaDI-Watch Partnership

Grant Engineering partnered with ReaDI-Watch in 2022 to take their Innovation and R&D efforts to the next level.



"Partnering with such a reputable and leading company as Grant Engineering has been a fantastic experience for ReaDI-Watch. Innovation is at the core of what Grant do, and our Platform is well positioned to accelerate this." **- Gerry Byrne, Chief Scientific Officer, ReaDI-Watch**

Innovation in Grants - an Example of an RD&I Project

"Compact Condensing Oil Boiler Development for Residential Space Heating – the 120mg/kWh Challenge."

An R&D Project was launched by Grant Engineering to advance its "Condensing Oil Boiler" Core Technology and build on its IP portfolio. This R&D work was aimed at creating a new product (Oil Boiler).

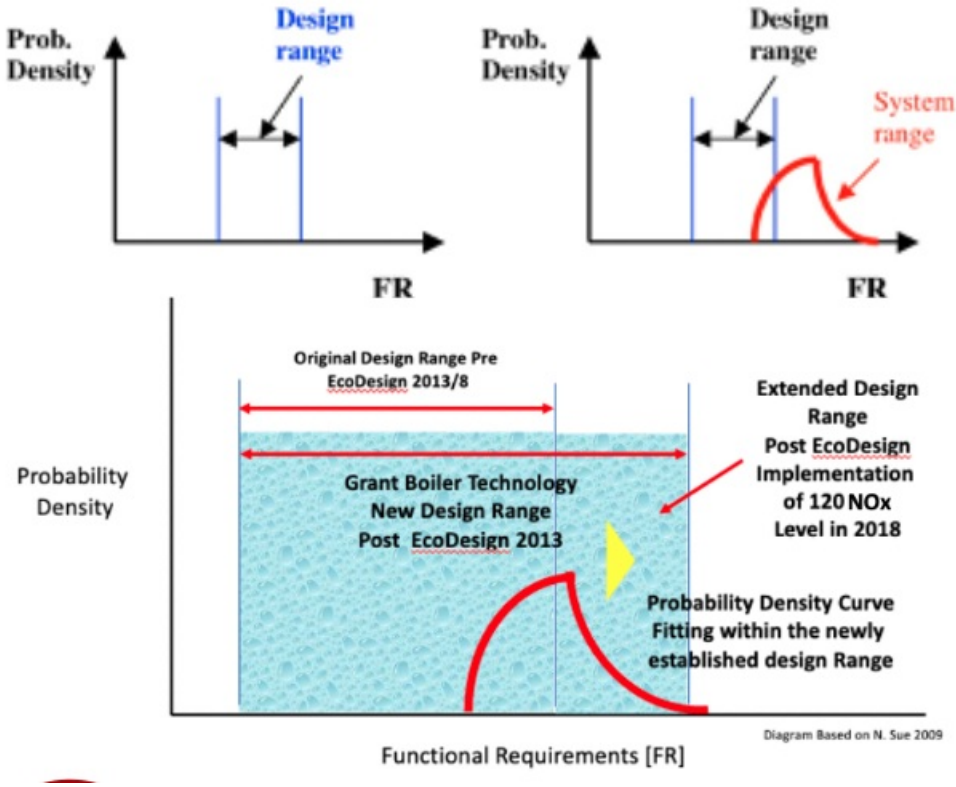
Insight: Core Technologies - All R&D Projects in Grant Engineering are classified as advancing existing (or advancing new) Core Technologies. This makes for a very strong case for R&D to be undertaken, and underpins strongly the company's IP.

Condensing Oil Boiler

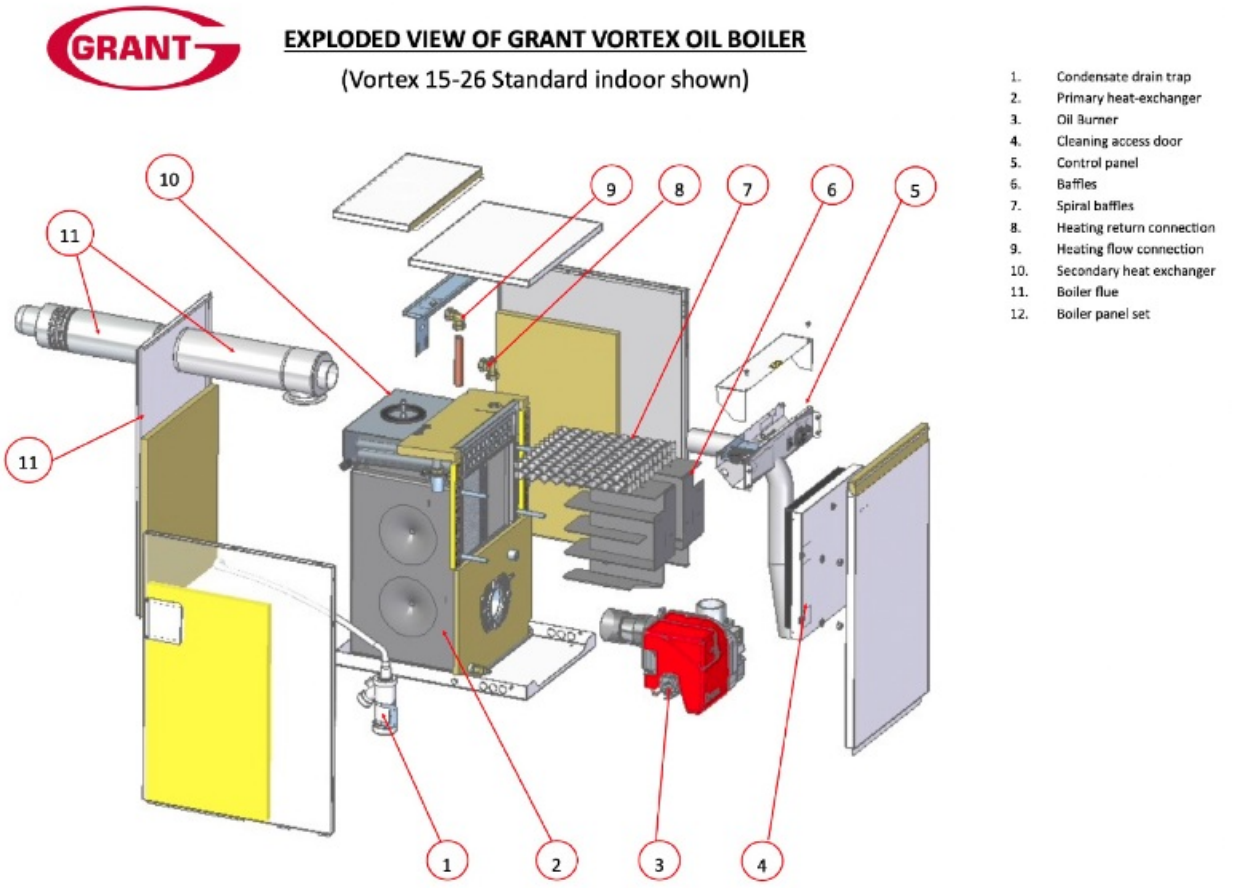
This Oil Boiler needed to comply with a new EcoDesign Directive (implemented in 2018), meant that R&D at Levels 3-5 on the Technology Readiness Level Scale (TRL) were essential to bring to market this identified new product.

Insight: Sustainability - Specific Sustainability Targets now drive Companies to undertake Experimental Development, beyond the international State of the Art in their fields of expertise. This is a huge driver of RD&I Investment going forward, and will impact on the Technology Roadmaps of all companies.

Additional Functional Requirements in R&D Experimental Development Programme were required to achieved NOx Regulation of 120mg/KWh (EcoDesign, 2013). A new Product Design Range needed to be achieved (Suh, 2005*) at a Prototype, Sub-System and System level to achieve the goals as set out on this project.



R&D work on this project was undertaken systematically, through a series of Work Packages and Investigations. To achieve the Technological Advancements as set out, each R&D Work Package consisted of sequential Investigations, initially in the Laboratory and subsequently (when Laboratory tests passed) in Simulated Field Tests. Each Investigation was undertaken by the Team, with Test Results, Lessons Learned & Analysis available on the ReaDI-Watch Platform.



Compact 860/900mm, 600 deep and 600wide –
quiet, small, must hold emission levels over the life of the boiler

Insight: Qualifying R&D vs Product Development- R&D work aimed at achieving regulatory compliance can only be considered as qualifying when new regulatory targets are set that require technological advancement to achieve, beyond the knowledge available in the public domain. Creating products where no technological advancements are achieved is classified as Product Development.

It is noted that this project was presented by ReaDI-Watch's CSO Prof. Gerry Byrne to CIRP CMAG Committee at CIRP AGM 2022, Bilbao .CIRP is the world leading organization in production engineering research and is at the forefront of design, optimization, control and management of processes, machines and systems.
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