SCROLL DESIGN IN THE REFRIGERATION COMPRESSOR INDUSTRY

Lecture by:

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This part of the course is intended to give an overview of how the design of a new compressor product is approached by industry. It will start from the beginning with the introduction of a new technology – scroll technology – into an existing market, and lead through to more detailed considerations, such as how to extend the range of applications and present the product to the user.

Part One

INTRODUCTION, HISTORICAL BACKGROUND, TODAY'S DESIGN PROCESS

Why should Copeland introduce a new technology into a market in which it is one of the dominant players with successful piston compressor designs?
The initial chosen application was US residential air conditioning where the expectations are very well known - efficiency, cost, size and weight, mode of operation, refrigerant, lifetime all well established with existing products.

The scroll concept, already known for many years, had the potential, but even with the acceptance of the basic compression mechanism there are many fundamental design choices which have to be made. High side or low side shell, bearing arrangement, structural welded construction, compliance mechanism, motor protection and so on all require consideration, and we will review the alternatives.

The first introduction of a new product such as scroll is by necessity limited in scope – range of models, application range and refrigerants. Once in production there is an immediate need to extend in many directions, and the design process can become shorter by utilising existing knowledge and experience. We will look at the design process required to bring a new scroll model into being, and how feedback is used to modify specific aspects of existing designs.

There will also be an outline of the design tools used by Copeland and how they enable groups in different locations world-wide to share work on a design project.