COMPRESSOR DESIGN FOR REFRIGERATION INDUSTRY

Lecture by:

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1. Introduction – What do we design for?
2. Some Historical background - Design of the very first Copeland scrolls – choices to be made – high side or low side shell, bearing arrangement, structural welded construction, development of the bolted shell, compliance mechanism, motor protection
3. Design process – based on the 2003 conference paper
4. Improvements and diversification – floating seal, shut down sound reduction, size range, 3-ph and 1-ph motor implications
5. The refrigeration scroll – concept based on A/C models, increasing the volume ratio, function of the discharge valve, liquid injection
6. Lubrication – basics for scroll, the Copeland approach to lubricant qualification. Transition from Mineral oil to POE. System considerations.
7. Design Tools outline, CAD – 2-D and 3-D procedures
8. Operating Envelopes - Limits of compressor operation - temperature, pressure, and all other restrictions that define the conditions over which the compressor can work with refrigerants, and how the designer adapts the design of scrolls and piston types to cope
9. Application Feedback – examples of field experience influencing the design.
10. How the product is specified for the user - Efficiency and Power compression losses process, isentropic efficiency, COP. how Copeland uses equations to define and predict power input, reference to standards – (some of this may appear under topics listed above rather than separate section)