

Review of “Casing and Liners for Drilling and Completions” by Ted G. Byrom

Dr. Byrom has created a classic with this treatise, covering everything from the very beginnings of how casing is made to key examples of the various types of string are designed and run.

He starts with the basics of how casing is made and the standards that apply. He then gives a brief overview of all the basic calculations such as hydrostatics and defines units, which is critical, including the use of oilfield unit.

He then defines the parameters used in design: depth, casing size, pore and frac pressures for all types of casing and gives examples of setting depth, casing size and hole size requirement.

He also discusses the loads on casing; collapse, burst or internal pressure including loadings for gas wells. This is followed with the explanation of how design loads are developed, how casing is selected and design factors are applied. Examples of several types of casing designs are given and example loads are calculated including combined loads. **This chapter is the heart of the work.** It shows how casing is selected (ie. weights, grades and connections to handle the anticipated loads).

Casing running is discussed and explained so that casing can be transported and run in the hole in good shape

He then steps beyond basics and discusses structural design and failure probability. This includes a comprehensive discussion of matrix algebra and tensors.

Byrom also turns to performance, discussing types of failures, including buckling and stability in both vertical and deviated swells. He mentions the effects of temperate.

Directional and horizontal wells are discussed, including the effect of friction and combined loading effects.

Finally he discusses several miscellaneous special topics, such as wear, expandable casing, casing drilling, fatigue and some aspects on cementing.

Dr. Byrom’s treatise is thorough and very complete, and it will give both a beginner and a seasoned veteran food for thought.

-- Dr. Ross Kastor, Professor of Mechanical Engineering, University of Houston