

Vicharnat Phuengpornsawan 2014: Study and Design Thickness of Pressure Vessel and Anthracite Filter Tray in the Pressure Vessel by Using Finite Element Method. Master of Engineering (Aerospace Engineering), Major Field: Aerospace Engineering, Department of Aerospace Engineering. Thesis Advisor: Associate Professor Group Captain Somchai Hanklar, Ph.D. 85 pages.

Since the the pressure vessel is common use for the aerospace petroleum and chemical industry and also the pressure vessel some type is require internal support for operation. This research aims to study and analyze the pressure vessel and anthracite filter tray according to code and standard.

The objective of thisresearch its studies thickness and each type of the anthracite filter tray in the pressure vessel by using finite element with an S4R four-node shell element model, which good support for the stress analysis and try to find reduce the thickness anthracite filter which applied support type as eight rectangular with one cycle, six rectangular with one cycle, four rectangular with one cycle, five cycles,eight rectangular with two cycles,six rectangular with two cycles,and four rectangular with two cycles support to reduce production cost andtime. The research began with the creation 3D model and finite element model of pressure vessel and anthracite filter tray. Then, material properties and boundary conditions were defined to analyze the deformation on the pressure vessel and seven type of anthracite filter tray. Then, the stress was calculated to determine the load on the pressure vessel and anthracite filter tray. The results obtained were in correlation with American Society of Mechanical Engineers Boiler and Pressure Vessel Committee (ASME) and deformation acceptance from designer. The deformation and maximum allowable stress on the eight rectangular with one cycle, six rectangular with one cycle, eight rectangular with two cycles, six rectangular with two cycles, four rectangular with two cycles supports pass acceptance criteria.

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Thesis Advisor's signature

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