

ABSTRAK

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Judul : Analisis Rancangan *Ammonia Receiver Pressure Vessel Horizontal* Pada Tekanan Operasi 25.1 Barg Dan Temperatur 60°C
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Ammonia Receiver dirancang sesuai dengan kebutuhan client berdasarkan ASME Sec. VIII Div.1 dengan tekanan operasi 25.1 barg dan temperatur operasi 60°C dan fluida yang bekerja adalah *ammonia gas*. Pada rancangan *shell*, *head* dan *nozzle* menggunakan metode perhitungan manual berdasarkan ASME Sec. VIII Div.1 dan software PV Elite sebagai pembanding didapatkan hasil dari keseluruhan perhitungan yaitu kurang dari deviasi 2.5%, namun pada perhitungan *nozzle* terdapat deviasi yang melebihi batas *error* 2.5% yaitu 10.342%. Sedangkan rancangan *saddle*, kekuatan struktural, faktor keamanan komponen pada *ammonia receiver* berdasarkan tegangan luluh, tegangan tangensial dan tegangan longitudinal menggunakan perhitungan manual berdasarkan Handbook Pressure Vessel dan standar ASCE-95, UBC 1997. Setelah melakukan perhitungan, ketebalan nominal plat *head* sebesar 16 mm dan *shell* 12 mm, tegangan tangensial 93.33 Mpa dan tegangan longitudinal 46.66 Mpa, faktor keamanan *ammonia receiver* sebesar 3.32 dan pada kondisi MAWP untuk *head* dan *shell* 3.34. Setelah dilakukan perancangan *Ammonia Receiver* yang menampung gas *ammonia* ini diharapkan dapat berfungsi dengan baik karena *Ammonia Receiver* ini sangat berbahaya yang dapat menimbulkan resiko tinggi dan dapat menyebabkan kecelakaan, seperti terjadinya ledakan.

Kata kunci : *Ammonia Receiver*, PV Elite, ASME, ASCE, UBC

ABSTRACT

Ammonia Receiver is designed according to client needs based on ASME Sec. VIII Div.1 with an operating pressure of 25.1 barg and an operating temperature of 60°C and the working fluid is *ammonia gas*. In the design of the *shell*, *head* and *nozzle* using the manual calculation method based on ASME Sec. VIII Div.1 and PV Elite software as a comparison, the results obtained from the overall calculation are less than 2.5% deviation, but in the *nozzle* calculation there is a deviation that exceeds the 2.5% error limit, which is 10,342%. While the *saddle* design, structural strength, component safety factor in *ammonia receiver* based on yield stress, tangential stress and longitudinal stress using manual calculations based on Handbook Pressure Vessel and ASCE-95 standard, UBC 1997. After doing the calculations, the nominal thickness of the *head* plate is 16 mm and *shell* 12 mm, tangential stress 93.33 Mpa and longitudinal stress 46.66 Mpa, *ammonia receiver* safety factor is 3.32 and in MAWP condition for *head* and *shell* 3.34. After designing the *Ammonia Receiver* which accommodates *ammonia gas*, it is hoped

that it will function properly because the Ammonia Receiver is very dangerous which can pose a high risk and can cause accidents, such as an explosion.

Keywords : Ammonia Receiver, PV Elite, ASME, ASCE, UBC