

INTISARI

Seiring dengan kemajuan jaman, penggunaan air panas sangat dibutuhkan untuk kebutuhan sehari-hari. Kebutuhan air panas dibutuhkan banyak orang terutama untuk kebutuhan pribadi, rumah tangga maupun yang lainnya. Dengan menggunakan *water heater* kita dapat mendapatkan air panas lebih mudah, lebih cepat, dan efisien. Tujuan penelitian : (a) Menghasilkan peralatan *water heater* gas LPG, yang diperlukan untuk mandi skala rumah tangga. (b) Mengetahui karakteristik dari *water heater* gas LPG (Mengetahui debit air yang keluar dengan suhu air sekitar 38°C-41°C dan mengetahui efisiensi dari *water heater* saat air keluar dari *water heater* dengan suhu air sekitar 38°C-41°C).

Lokasi penelitian di laboratorium Teknik Mesin, Universitas Sanata Dharma, Yogyakarta. *Water heater* yang dibuat menggunakan bahan bakar gas LPG berbentuk tabung yang terbuat dari galvanis dengan tinggi 30 cm dan berdiameter 30 cm. Memiliki dua tabung *water heater* yang diberi lubang sirkulasi udara yang dirangkai secara seri, dengan 3 lapisan tabung pada 1 *water heater*. Tabung yang ditempelkan pada tutup *water heater* berdiameter 9 cm, tabung dalam pada *water heater* berdiameter 22 cm, tabung luar berdiameter 30 cm, tutup *water heater* berbentuk lingkaran dan diberi lubang udara. Pipa menggunakan bahan tembaga berdiameter 0,5 inci, panjang pipa 8 meter dirol secara bertingkat. Variasi penelitian dilakukan dengan mengatur besar kecilnya debit aliran air yang masuk dengan 10 variasi debit air yang masuk ke dalam *water heater* dengan tekanan aliran gas rendah dan sedang. Sehingga nantinya mampu bersaing dengan *water heater* yang ada dipasaran.

Hasil penelitian (a) Telah berhasil membuat peralatan *water heater* gas LPG, yang dipergunakan untuk keperluan mandi air panas skala rumah tangga. (b) Karakteristik *water heater* yang dibuat : Untuk suhu air keluar *water heater* antara 38°C-41°C pada rangkaian seri dengan tekanan aliran gas rendah debit air sebesar 10-13,2 liter/menit dan pada tekanan aliran gas sedang debit air sebesar 13,8-19 liter/menit. Untuk suhu air keluar *water heater* antara 38°C-41°C pada rangkaian tunggal dengan tekanan aliran gas rendah debit air sebesar 5-6,8 liter/menit dan pada tekanan aliran gas sedang debit air sebesar 7-10 liter/menit. Untuk suhu air keluar *water heater* antara 38°C-41°C dengan tekanan aliran gas rendah efisiensi *water heater* sebesar $\eta = 37-38\%$ pada rangkaian seri dan efisiensi *water heater* sebesar : $\eta = 40-42\%$ pada tunggal. Untuk suhu air keluar *water heater* antara 37°C-40°C dengan tekanan aliran gas sedang efisiensi *water heater* sebesar $\eta = 37-38\%$ pada rangkaian seri dan efisiensi *water heater* sebesar : $\eta = 35-39\%$ pada tunggal.

Kata kunci : kebutuhan air panas, mengasihkan *water heater*, karakteristik *water heater*

ABSTRACK

Along with the progress of the times, hot water is required for everyday needs. It is needed by many people, especially for personal needs, household, and others. By using water heater, we can get hot water easier, faster, and more efficient. This research was aimed to: (a) produce LPG water heater equipment, which is required for household scale baths. (b) know the characteristics of the LPG water heater (the water discharge while the water temperature is around 38°C-41°C as well as the water heater efficiency when the water comes out from the water heater while the water temperature is around 38°C-41°C).

The location of the research was in the laboratory of Mechanical Engineering, Sanata Dharma University, Yogyakarta. The water heater was made using tube shaped LPG as the fuel made of galvanis plate with 30 cm height and 30 cm in diameter. Two water heaters were used given ventilation hole(s) and assembled in series, with 3 layers of tube on one water heater. A tube attached on the water heater 9 inches in diameter, a tube in 22 cm in diameter water heater, a tube with a diameter of 30 cm, the water heater and air holes a circular shape. The pipe was made of copper 0.5 inch in diameter, pipe length was 8 meters rolled in level. The variations of the research were conducted by setting the volume of water discharge entering the water heater, with 10 variations of water discharge entering the water heater, with low and medium gas flow pressure. Where later on it could compete with other water heaters in the market.

The result of research (a) LPG water heater equipment which is used for household scale bath had been successfully made. (b) knowing the water heater characteristics : For temperature water out water heater between 38oc-41oc at the series with a stream of gas low pressure discharge of water by 10-13,2 liter/ minutes and with a stream of gas medium pressure discharge of water by 13,8-19 liter/minutes. For temperature water out water heater between 38°C-41°C at the single with a stream of gas low pressure discharge of water by 5-6,8 liter/ minutes and with a stream of gas medium pressure discharge of water by 7-10 liter/minutes. For water temperature coming out from water heater between 38°C - 41°C with low gas flow pressure, the efficiency of water heater was $\eta = 37-38 \%$ in series and the efficiency of water heater was $\eta = 40-42 \%$ in single. For water temperature coming out from water heater between 38°C - 41°C with medium gas flow pressure, the efficiency of water heater was $\eta = 37-38 \%$ in series and the efficiency of water heater was $\eta = 35-39 \%$ in single.

Keywords : the need for water hot, produce water heater, characteristics water heater