Homework 10

Problem 1:

In order to cool 120,000 lb/hr of 2,6-dimethyl octane from 80 to 120°F, I propose the following parameters for the heat exchanger.

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| Tube material | HA steel 304 |
| Tube length | 21 ft |
| # of tubes | 480 |
| # of tube passes | 2 |
| Shell diameter | 31 in |
| Baffle spacing | 10 in |
| Tube pressure drop | 0.172 psi |
| Shell pressure drop | 0.645 psi |
| Overdesign factor | 17.5% |

Problem 2:

In order to cool 400,000 lb/hr of benzene from 250 to 150°F, I propose the following parameters for the heat exchanger.

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| Tube material | HA steel 304 |
| Tube length | 40 ft |
| Fan diameter | 20 ft |
| # of fans | 2 |
| # of tubes | 350 |
| # of tube passes | 1 |
| Fin material | Copper |
| Fin spacing | 10/in |
| Tube pressure drop | 0.389 inH2O |
| Air pressure drop | 0.493 inH2O |
| Overdesign factor | 17.8% |