

Supplemental Material

Globally Optimal Basic Design of Multiple-Unit Heat Exchangers

Miguel J. Bagajewicz^{*,§,†,*}, *Andre L. M. Nahes*[‡], *Eduardo M. Queiroz*[§], *Diego G. Oliva*⁺, *Javier A. Francesconi*[§], *André L. H. Costa*[‡]

(§)School of Chemistry, Federal University of Rio de Janeiro (UFRJ), Brazil.

(†)School of Sustainable Chemical, Biological, and Materials Engineering, University of Oklahoma, USA

(*^{*}) Mewbourne Petroleum & Geological Engineering Department, University of Oklahoma, USA

(‡)Institute of Chemistry, Rio de Janeiro State University (UERJ), Brazil.

(⁺)Instituto de Desarrollo y Diseño, Universidad Tecnológica Nacional, CONICET, FRSS, Santa Fe, Argentina

(§) ITHES -Instituto de Tecnologías del Hidrógeno y Energías Sostenibles (UBA-CONICET), Buenos Aires, Argentina.

(*^{*}) Corresponding Author: Miguel Bagajewicz: bagajewicz@ou.edu.

We show some examples of alternative arrangements that have been mentioned in the literature:

- Figure S-1 shows a series-parallel configuration proposed by Gardner (1942). This configuration can be considered as a series-parallel configuration where each unit is in turn considered as two exchangers in series. In other words: “a basic structure (units in series) playing the role of a “unit” of another structure (“units in series-parallel”).
- Figure S-2 is a series-parallel configuration considered by Peccini et al. (2019,2023). This configuration can be considered as a parallel configuration of two units, where each unit can in turn be considered as a series-parallel configuration. In other words: “a basic structure (units in series-parallel) playing the role of a “unit” of another structure (“units in series-parallel”).
- Figure S-3 shows a special series-parallel configuration taken from Gardner (1942). This configuration cannot be considered as a basic structure representing units of another basic structure. Therefore, new equations for the overall correction factor will have to be developed.

- Figure S-4 presents two alternative configurations of a 1-2 exchanger. We remark that the co-current/co-current configuration presents piping challenges because the shell outlet of one shell does not align with the shell inlet of the next.
- Figure S-5 presents 4 possible combinations of a 2-4 STHE. Here, the co-current/co-current and the counter-current/counter-current configurations present the same piping challenges mentioned above.

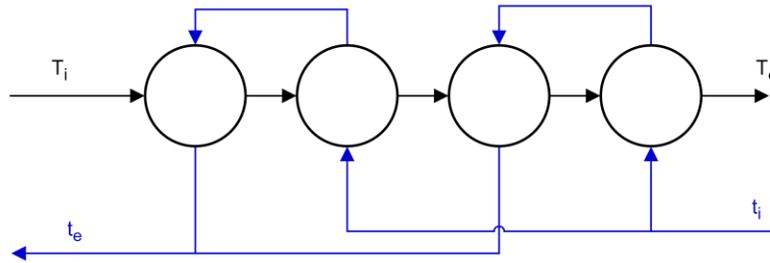


Figure S-1: Special Series-Parallel Configuration (Gardner, 1942, Figure 4)

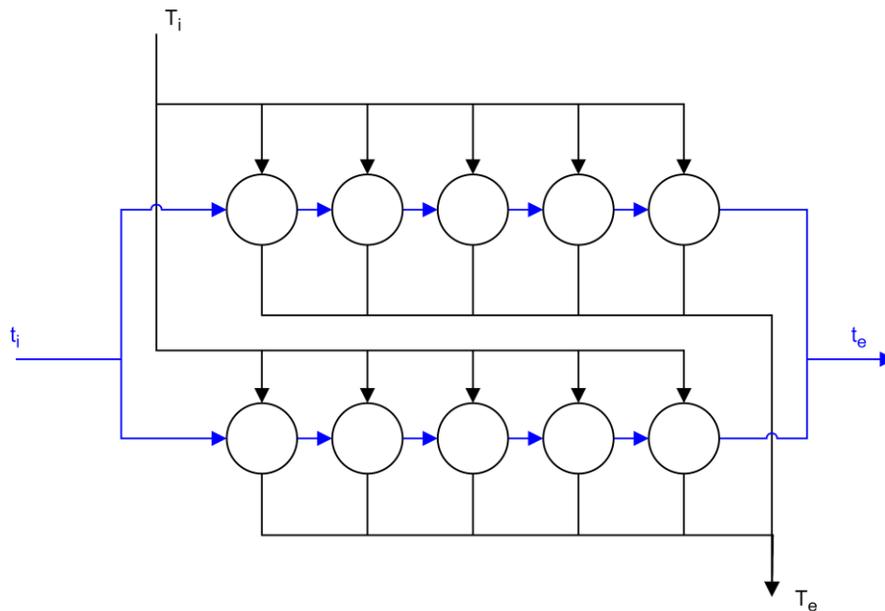


Figure S-2: Special Parallel-Series-Parallel Configuration (Peccini et al, 2019,2023)

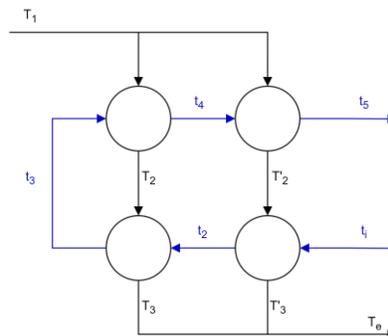


Figure S-3: Special Series-Parallel Configuration (Gardner, 1942, Figure 4)

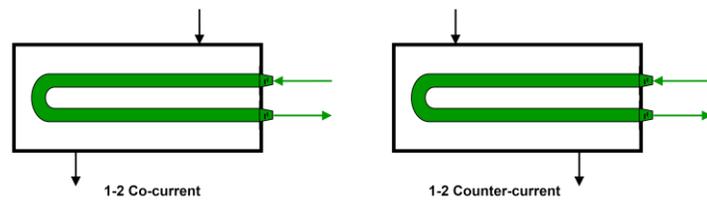


Figure S-4: Two geometries for a 1-2 exchanger.

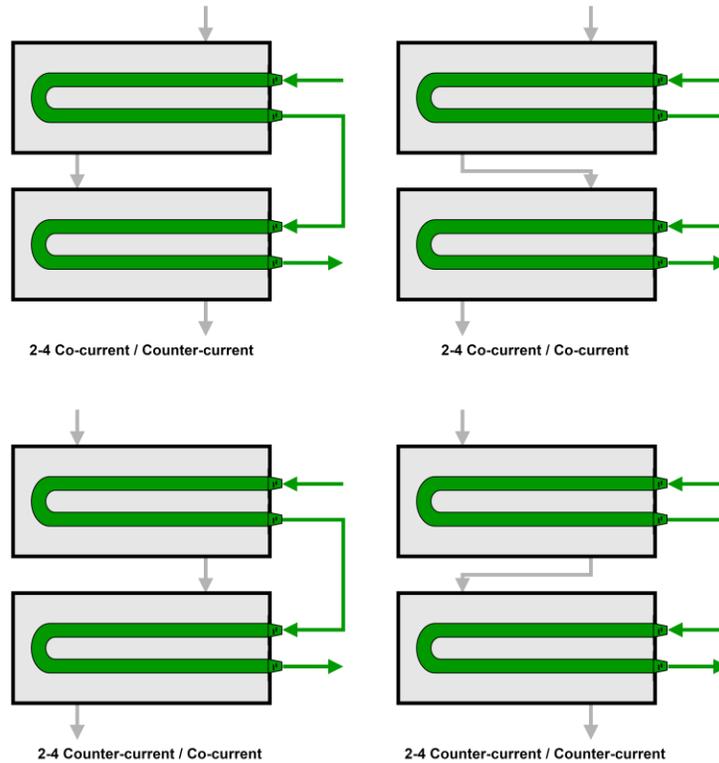


Figure S-5: Four configurations for a 2-4 exchanger.

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