# Article information:

Design and optimization on symmetrical wing longitudinal swirl generators in circular tube for laminar flow - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S0017931022004343>

# Article summary:

1. A novel type of tube inserts, symmetrical wing longitudinal swirl generators (SWLSGs), was proposed and its thermal hydraulic performance was numerically investigated under laminar flow.

2. The range of the efficiency evaluation criterion (EEC) was 0.71–1.35, and exergy destruction minimization principle was adopted to optimize SWLSGs.

3. Neural network fitting and Non-dominated sorting genetic algorithm-Ⅱ(NAGS-Ⅱ) were applied to obtain the Pareto front for optimal design of SWLSGs.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article “Design and optimization on symmetrical wing longitudinal swirl generators in circular tube for laminar flow” is a well-written piece that provides an overview of the design and optimization process for a novel type of tube inserts, symmetrical wing longitudinal swirl generators (SWLSGs). The article is written in a clear and concise manner, making it easy to understand the concepts presented. The authors provide detailed information about the geometrical parameters of SWLSGs, as well as their effects on thermal hydraulic performance. They also discuss the mechanisms of heat transfer augmentation for SWLSGs, which are divided into two main categories: forming a longitudinal swirl flow with multi-vortexes and guiding cold water in the center to scour tube wall.

The article is generally reliable and trustworthy; however, there are some potential biases that should be noted. For example, while the authors discuss various types of tube inserts such as twisted tapes, coiled wires, vortex generators, porous media etc., they focus mainly on their own proposed solution – SWLSGs – without providing sufficient evidence or comparison with other solutions. Additionally, while they discuss various methods for optimizing SWLSGs such as neural network fitting and Non-dominated sorting genetic algorithm-Ⅱ(NAGS-Ⅱ), they do not explore any counterarguments or alternative approaches that could be used instead or in addition to these methods. Furthermore, while they discuss exergy destruction minimization principle as an effective evaluation index for design and optimization, they do not provide any evidence or data to support this claim.

In conclusion, this article provides an overview of the design and optimization process for a novel type of tube inserts – SWLSGs – but there are some potential biases that should be noted when evaluating its trustworthiness and reliability.

# Topics for further research:

* Twisted tape inserts
* Coiled wire inserts
* Vortex generator inserts
* Porous media inserts
* Neural network fitting optimization
* Non-dominated sorting genetic algorithm-Ⅱ (NSGA-Ⅱ) optimization

# Report location:

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