

GEWA-PB

Enhanced Boiling Tube for the Hydrocarbon Processing Industry

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The GEWA-PB OD/ID enhanced tube with a nucleate boiling structure on the shell side and a spiral fin structure on the tube side has been specially developed for shell-and-tube heat exchangers for horizontal Boiling operations in the Process industry. The tube is mainly used for clean processes such as in LNG and olefins plants as well as refinery lights-end sections, C2 and C3 refrigeration systems.

The GEWA-PB tube is highly efficient through the combination of high heat transfer coefficients on both shell-and-tube side. Thermal performance and industrial suitability of the GEWA-PB tube have been verified in a number of European research programmes. Design data for both enhanced shell-and-tube side are, therefore, available for a series of process conditions.

Industrial suitability has been proven in a C3 splitter reboiler in a polypropylene plant commissioned in the middle of 2000. Since then many applications have been realized in olefins and LNG plants as well as chilling plants, see GEWA-PB reference list.

The shell-side boiling structure is particularly suitable for boiling at small temperature differences, low saturation pressures and small wall superheat temperatures where standard tube technologies are no longer applicable.

Regarding the tube-side heat-transfer enhancement with an internal spiral fin structure, performance data are available for

various fluids and process conditions for both condensation and single-phase flow.

The overall benefit of the GEWA-PB tube is described in a case study for a propane chiller in a pre-cooling cycle of a large LNG plant. Different tube types such as plain, low-finned (LF) and GEWA-PB are compared with each other. Substantial benefits are identified both with regard to tube length and total heat exchanger weight. Details are given in the table and diagramme overleaf.

Design proposals are available from Wieland upon request.

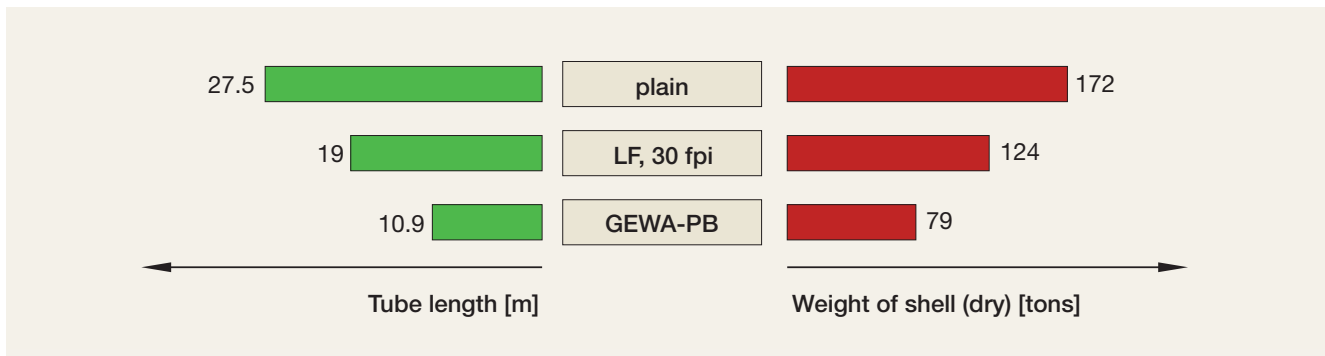


Propane Chiller in LNG plant

Specification of propane chiller

Heat Duty	45 MW
Shell Design	NKN, 1-pass, bundle OD = 1500 mm, 3/4" GEWA-PB, tube count: 3745
Shell-side Fluid	Propane, $T_{\text{sat}} = -21.8 \text{ }^{\circ}\text{C}$
Tube-side Fluid	Mixed refrigerant, condensing, $T_{\text{in/out}} = -1.9 / -18.5 \text{ }^{\circ}\text{C}$

Design comparison for propane chiller with different tube types (plain, low-finned, GEWA-PB)



GEWA-PB tube specification

Plain tube dimensions - outside diameter - wall thickness at plain end	3/4" 2.11 mm (nom.)	5/8" 1.70 mm (nom.)
Finned tube dimensions - tube length - wall thickness under the fins	≤ 15 m 1.4 mm (nom.)	≤ 15 m 1.0 mm (nom.)
Tube code	PB-8407.17140-49 PB-8407.17140-40 (tubeside liquid)	PB-8407.14100-49
Material	ASTM-A 179, ASTM-A 334 Gr. 1, 6	
Heat treatment	- stress relieving heat treatment, if required (ASTM-A 498)	
Quality control	- eddy current test ASTM-A 450 - pneumatic leak and hydraulic pressure testing upon request	
U-bends	- available on request	

For further information please contact our Technical Marketing Department.

