



POLYTUBE shell and tube heat exchangers in GRAPHILOR®



CARBONE LORRAINE: anti-corrosion specialist in the chemical industry

In 1952, the Chemical Engineering Department manufactured its first impregnated graphite, GRAPHILOR, heat exchangers. Worldwide, almost every company in the chemical industry uses CARBONE LORRAINE heat exchangers.

Tens of thousands of GRAPHILOR exchangers are operating everywhere in the world.

Adapted to the service required, these units belong to two main series:

- Shell and tube exchangers: POLYTUBE
- Block exchangers: POLYBLOC.



POLYTUBE: an extensive range

CARBONE LORRAINE manufactures three types of POLYTUBE:

Type*	Shell side	Tube side
PYTIC	6 bars	3 or 6 bars
PYTUC	6 bars	3 bars
PYTOR	3 or 6 bars	3 bars

* Specifications are available on request.

For each type of POLYTUBE, a wide range of diameters is available; increasing by increment of 2" (50 mm) between 8" and more than 80" (200 mm to more than 2 m).

For each shell diameter, there is an optimal tube layout, which guarantees the compactness, strength and thermal efficiency of the units.

CARBONE LORRAINE teams of engineers design the exchangers with the assistance of powerful computer techniques based on the latest results of research into heat exchange.

The best economic solution is obtained by taking the following factors into consideration:

- corrosive fluids
- pressure drops
- fouling factors
- operating pressures
- allowable space.





The constructional guidelines for POLYTUBE exchangers are those of ASME and TEMA.

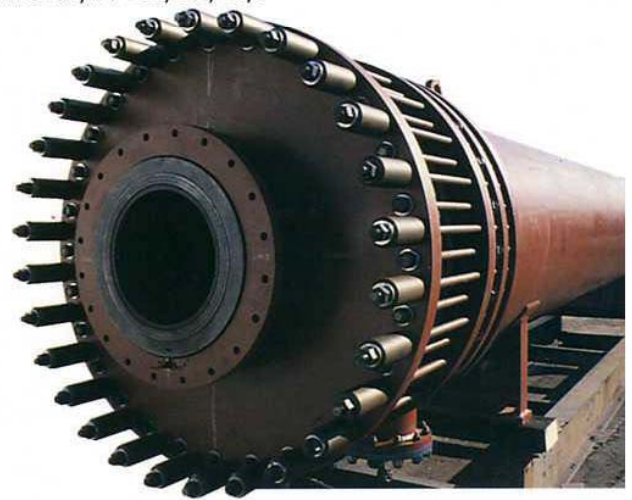
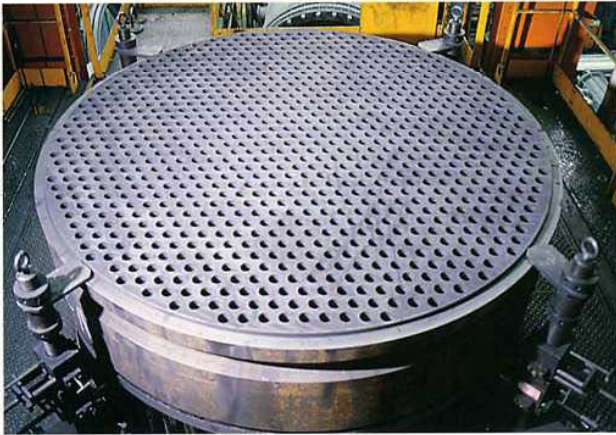
POLYTUBE heat exchangers are manufactured to satisfy the requirements of each user, while employing standardised components.

The components common to all POLYTUBE are:

- GRAPHILOR tubes
- GRAPHILOR tube sheets
- PTFE gaskets.

The baffles and covers can be adapted to the specific requirements, because of the wide variety of materials used: GRAPHILOR, coated or special steels, laminated composites, ...

The shells are manufactured in accordance with the different national codes (CODAP, ASME, ADM, Stoomwezen, ISPEL, JIS, ...).



The materials and the techniques

GRAPHILOR

The transformation of amorphous carbon into artificial graphite was accomplished for the first time in 1893 by Messrs. STREET and GIRARD from CARBONE LORRAINE. Since this time, CARBONE LORRAINE has manufactured almost all the products based on graphite and carbon, and is now, thanks to the work of its researchers and engineers, the leader or even the sole manufacturer in many fields :

- brushes for electric machines,
- carbon/carbon composites,
- parts for nuclear energy,
- graphites for space applications, ...

GRAPHILOR has taken advantage of CARBONE LORRAINE long experience in all the processes and applications connected with graphite and, especially, in the field of graphitization and impregnation processes which ensure imperviousness and an excellent mechanical strength.



Machining of GRAPHILOR

GRAPHILOR tubes and tube sheets are machined on:

- digital multi-spindle drilling machines:
drilling depth up to 1,200 mm,
diameter up to 2,400 mm,
- vertical lathes with 3,000 mm table,
- automatic tube machining machine:
lengthwise and simultaneous machining of the
two ends,
- automatic checking and testing machine.

Assembly

The POLYTUBE components are assembled in large workshops equipped with cranes allowing to handle loads of 40 tonnes, and to direct loading on a lorry or a wagon.



The technical data contained herein is by way of example and should not be relied on for any specific application. IE CARBONE LORRAINE will be pleased to provide specific technical data or specifications with respect to any customer's particular applications. Use of the technical data or specifications contained herein without the express written approval of IE CARBONE LORRAINE is at user's risk and (include name of company) expressly disclaims responsibility for such use and the situations which may result therefrom. IE CARBONE LORRAINE makes no warranty, express or implied, that utilization of the technology or products disclosed herein will not infringe any industrial or intellectual property rights of third parties. IE CARBONE LORRAINE is constantly involved in engineering and development. Accordingly, IE CARBONE LORRAINE reserves the right to modify, at any time, the technology and product specifications contained herein. All technical data, specifications and other information contained herein is deemed to be the proprietary intellectual property of IE CARBONE LORRAINE. No reproduction, copy or use thereof may be made without the express written consent of IE CARBONE LORRAINE.

Quality control

A quality control department, independent of production, and agreed by the official authorities (CODAP, ASME, ADM, TÜV, ...) checks the different stages in the manufacture of the POLYTUBE exchangers. Several very stringent checks are carried out:

- identification and marking of the basic materials,
- pneumatic test on the rupture strength of each tube,
- pneumatic tightness test of each tube,
- check on metallic parts (materials, tolerances, welds, dimensions),
- hydraulic and pneumatic test on the complete exchangers.

Certificates are supplied for each POLYTUBE. The scope of the certificates is adapted to the different national codes ((CODAP, ASME, ADM, TÜV, ...):

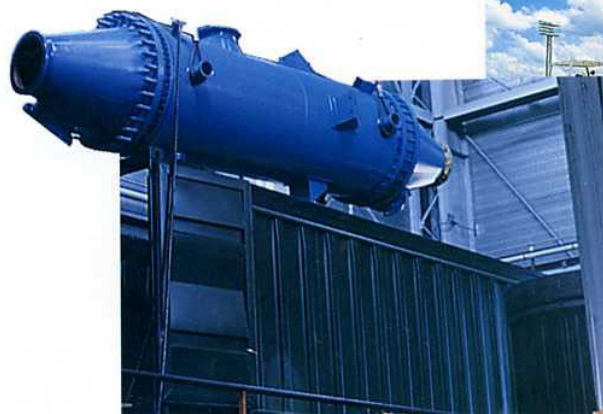
- GRAPHILOR components material certificates,
- test certificates,
- certificates relative to the welding, ...



AFTER-SALES SERVICE

With factories and subsidiaries in more than 30 countries and 250 commercial agencies throughout the world, CARBONE LORRAINE offers its customers everywhere reliable high technology products and the service of its experienced technicians. Wherever you are, we have trained teams available to attend on site. Our workshops are equipped for the maintenance and repair of all graphite heat exchangers.

An organisation designed for full collaboration with the customer, so that the use of the equipment satisfies effectively its specific requirements. Engineers, specialised and experienced in chemical engineering, work as a team from the initial enquiry to the processing of the order: from the manufacture to the commissioning of the POLYTUBE unit.



SPECIALISTE MONDIAL
de composants pour
l'industrie

Dès l'origine, 1892, CARBONE LORRAINE affirme sa vocation internationale en créant des filiales sur tous les continents.

Aujourd'hui, avec des établissements industriels et commerciaux dans plus de 30 pays, des agences et représentations dans plus de 70 pays et 250 contacts commerciaux répartis dans le monde entier, CARBONE LORRAINE donne à sa clientèle l'assurance de trouver partout des produits fiables, de haut niveau technologique et le service d'assistance de ses techniciens expérimentés.

WORLDWIDE SPECIALIST
in industrial
components

Since its foundation in 1892, CARBONE LORRAINE has built up an international reputation by creating subsidiaries on all continents.

Today with industrial and commercial plants scattered in more than 30 countries, agencies and representatives in more than 70 countries and 250 commercial contacts throughout the world, CARBONE LORRAINE offers its customers everywhere reliable high technology products and the service of its experienced technicians.

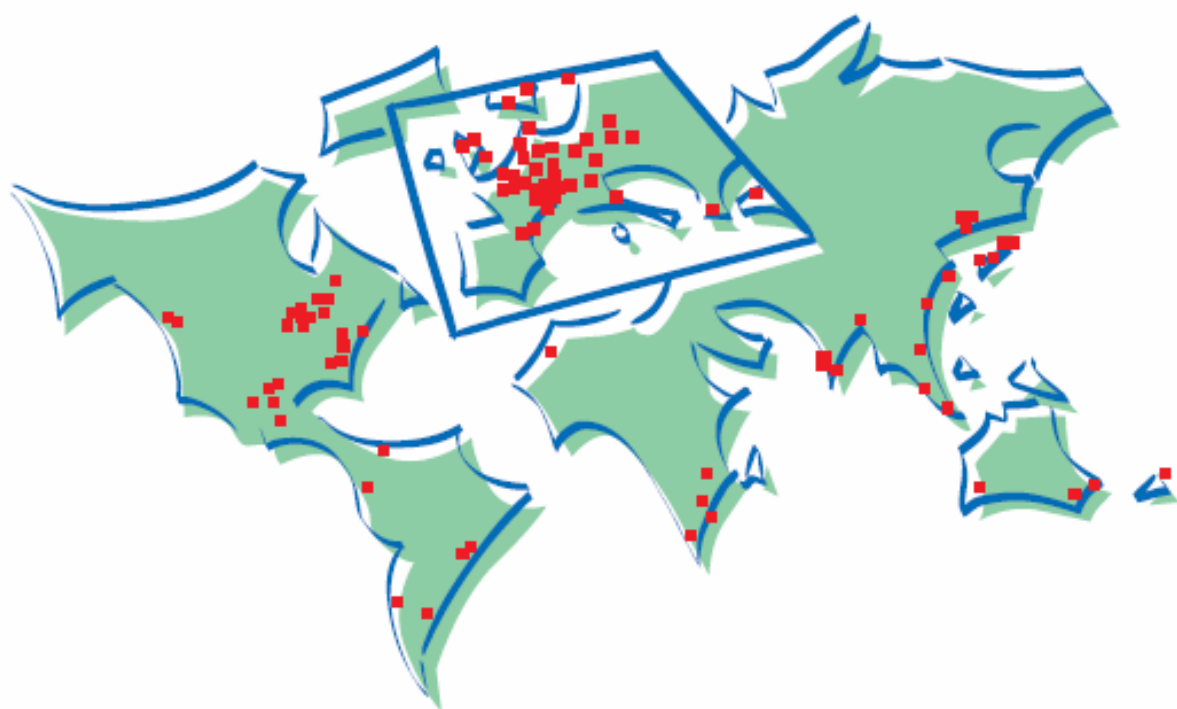
**INTERNATIONALER
SPEZIALIST**
für Industriebauteile

Die Gründung von Tochtergesellschaften auf allen Kontinenten ist Bestandteil der Politik von CARBONE LORRAINE seit dem Beginn der Firmengeschichte im Jahre 1892. Heute, mit Produktions- und Vertriebsniederlassungen in mehr als 30 Ländern, Agenturen und Vertretungen in mehr als 70 Ländern und 250 Ankaufstellen für Kunden in der ganzen Welt, sichert CARBONE LORRAINE ihren Kunden überall auf der Welt zuverlässige Produkte mit hohem technischen Niveau sowie den Kundendienst erfahrener Techniker zu.

Une présence internationale

A worldwide organization

Weltweite Präsenz



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