

Manoir AlloyServices®
High Alloy Technology and Field Services
for Petrochemical Industry



Manoir Petrochem & Nuclear BU

Manoir AlloyServices®: A Worldwide Client Services Solution

Welding high temperature alloys is a key element of the Manoir Industries portfolio.

The new Manoir AlloyServices® goals focus on a wide range of services including expert metallurgical advice welding supervision and field welding even on non Manoir materials.

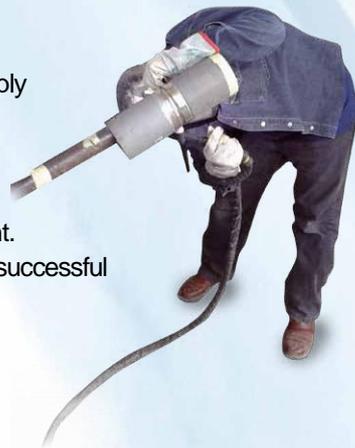
Responsiveness is the key word: upon request and only a phone call away, our advanced welding team is in a position to dispatch a crew of highly skilled welders worldwide in association with Manoir UK that can highlight solutions, oversee field welding and train customers' welders in order to overcome any possible language barrier.

Highly experienced in welding both new but mostly aged materials, the welding staff dispatched to site displays advanced skills and provides solutions to overcome very complex situations. After an in-depth analysis provided by Manoir metallurgy experts, a repair crew can address repairs on the aged or damaged tubes, or replace them for new ones when necessary.

Manoir Industries is actively involved in the certification of local welders to qualify them to successfully weld our patented Manaurites® XM, XTM, high or low carbon alloys and as a result of this effort. Manoir Industries can mobilize local welders from every continent to intervene locally.

This service not only includes manpower (erection, welding supervision, fitter, welders, NDT personnel) but can also supply and dispatch welding equipment to the field.

Welding processes used are either GTAW or SMAW or a combination of both based on standard practices and individual situations to be determined together with the client. Every welding job is thoroughly inspected and certified with successful Xray and LP results.



“ Thanks to our global team of welders, Manoir Industries can be on site within

Manoir Industries is a global company involved in metal processing. Components, cast or forged and assemblies are dedicated to highly demanding markets such as petrochemical, nuclear, oil & gas, civil engineering, energy, steel making industry and defense.

A historically strong and well-known technical expertise driven by increasingly demanding customer requirements and demands have fostered the developments of new materials, and innovative solutions.



Manoir Industries, a global integrated service

7 plants in Europe and China

100 agents worldwide

More than 5000 reformer tubes supplied every year

Reformer projects of more than 1400 tubes

Market leader in DRI process gas heaters supply

50 full ethylene furnaces per year sold on average



Steam Cracking Tube Damage Evaluation

In steam cracking process, radiant tubes/coils under go coking and decoking cycles; under those extreme temperatures, coke diffuses into the steel and the material carburizes. Carburization leads to loss of mechanical properties and tube rupture. Materials become unrepairable.

Manoir Industries provides its customers a non-destructive carburization device (see below), that provides its customers with the ability to quantify precise carburization levels and the degree of use of the tubes by destructive testing and further failure analysis.

50 years of experience in providing high alloys (Manaurites®) and seeing them perishing provides unique opportunities to build an extensive and detailed database of case studies, that are very important in establishing failure scenario and providing an in-depth response to our customers.



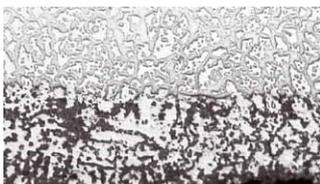
*f highly qualified and experienced
n jump into action 24/7 worldwide
48 hours (visa permitting)*

” Non-Destructive Carburization Measurement Devices (NCMD's)

As explained above, carburization of the material leads to failure. Another side effect of this phenomenon is that the originally non-magnetic alloy becomes magnetic under carbon diffusion and Chromium depletion.

Manoir Industries has designed 2 NCMD's aimed at quantifying on a non-destructive basis carburization levels by measuring magnetic permeability. One device uses the Hall Effect and gives a pinpoint carburization value while the other device is an inductance meter that provides an average carburization level inside the tube.

The 2 devices have to be calibrated compared to carburized tubes (low-medium-high) in order to cross check the device reading with actual carburization levels in Carbon pick-up percentages.



Reformer Tube Life Assessment

Manoir Industries celebrated in 2010 the 50th anniversary of Nb as an alloying element to form carbides for creep resistance in its high alloys Manaurites®! Manoir therefore owns a significant library of creep testing, creep failure mechanisms, degradation processes due to hoop stress and strain relaxation related to thermal shocks resistance depending on tube thicknesses.

Consequently, Manoir Industries provides its clients with advanced expertise of the level of damage in reformer tubes and remaining life time assessments. This expertise is based on destructive tests performed on samples provided by the customer. This allows cross checking NDT results performed by specialized companies evaluating reformer tube damage by means of eddy current or ultra-sonic tests. Performing destructive tests allows our customers to better plan furnace revamps and material procurement at the most adequate timing.



Process Know-How

Manoir Industries holds aside from its material and metallurgical knowledge, a strong pool of process specialists able to assist in furnace process enhancement. This includes furnace process simulation tools in ethylene plants that highlight advantages and impacts of any Manoir Industries' new technology in any given furnace and the plant as a whole. The same applies to DRI plants where our experts have a comprehensive understanding of the entire process to direct R&D efforts and support after-sales services to our clients on and off the field.

International Exposure



Manoir Pîtres

12 Rue des Ardennes - BP 8401 - Pîtres
27108 Val de Reuil CEDEX - France



Manoir Yantai

N°1, Zhichu South Road, Zhifu district
Yantai China - 264 000



Manoir UK

Hi-Tech Fabrication Ltd
Bretby Business Park - Ashby Road
Burton on Trent - Staffordshire DE15 0YZ - UK



Manoir Petro India Limited

Universal Business Park
602, B - Wing - Chandivali Farm Road - Andheri (E)
Mumbai - 400 072 - India



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