

Vallourec's French know-how

Vallourec, a world leader in premium tubular solutions, provided 300 metric tons of structural tubes for the construction of this complex work of architecture.

These high-tech tubes surround the walkway throughout its entire length, both around its lower layer and its upper portion. To meet this aesthetic challenge, Vallourec paid particular attention to the state of the tubes' surface, adding a grinding step post-manufacturing.

Most of the tubes were produced at Vallourec's Aulnoye-Aymeries site in the north of France using a totally unique patented process known as "Premium Forged Pipes®", employing Vallourec Group's renowned industrial expertise.

The thermal treatment that the tubes received also gave them exceptional mechanical characteristics, making them very strong and resilient, necessary qualities for this type of challenging structure.

Thanks to the responsiveness of Vallourec's teams, the tubes were delivered in record time.

Designer tubes: technical characteristics

- 323,9 mm diameter by 32 & 45 mm thick: these are the thickest tubes, forming the lower layer of the footbridge.
- 323,9 mm by 20 mm: these tubes form the upper portion of the footbridge.
- 2 types of length: 7.9 m and 8.3 m
- Premium-grade steel: S355QH+T carbon steel.

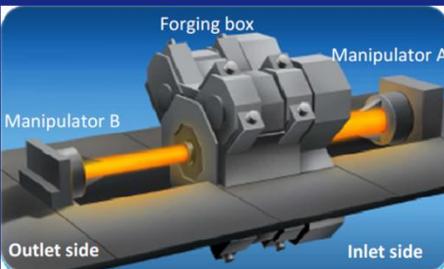
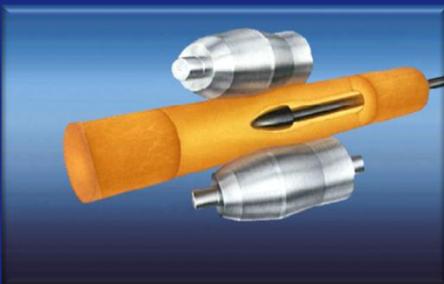
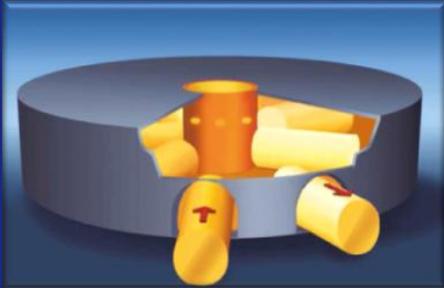


Caroline Teroin, in charge of Industry activity for France

"It was with pride and passion that Vallourec's teams welcomed the opportunity to participate in this work of exceptional technicity. We were particularly pleased to accompany ADP and Baudin Châteauneuf in this adventure with our specialized industrial know-how. It was with pride and passion that Vallourec's teams welcomed the opportunity to participate in this work of exceptional technicity. We were particularly pleased to accompany ADP and Baudin Châteauneuf in this adventure with our specialized industrial know-how."



Focus on the Premium Forged Pipes® process



Florent Holl, manager of Aulnoye-Aymerie forge

Thanks to the capabilities of the forge, we are able to offer our customers customized products of impeccable quality. Its great flexibility makes it possible to manufacture in small batches and to deliver with short lead times."

The premium production of the tubes at the Aulnoye-Aymeries forge (Northern France)

Forging

After a preliminary "series preparation" phase where requirements, deadlines, and the delivery schedule are validated by engineers and technicians, production begins with hot forging of the tubes using the patented Premium Forged Pipes® process. In this process, steel billets are heated to 1,200°C in a furnace with a rotating floor. They are pierced by a punch, using a process known as the "Mannesmann process" and then forged, meaning hammered, coming out hollow and elongated. The seamless tubes have then been manufactured, but they are still in an unfinished state. The Aulnoye-Aymeries forge is world-renowned for its ability to adapt and its responsiveness to even the most stringent customer requirements for tolerance, shape, dimensions, and related services.

Finishing

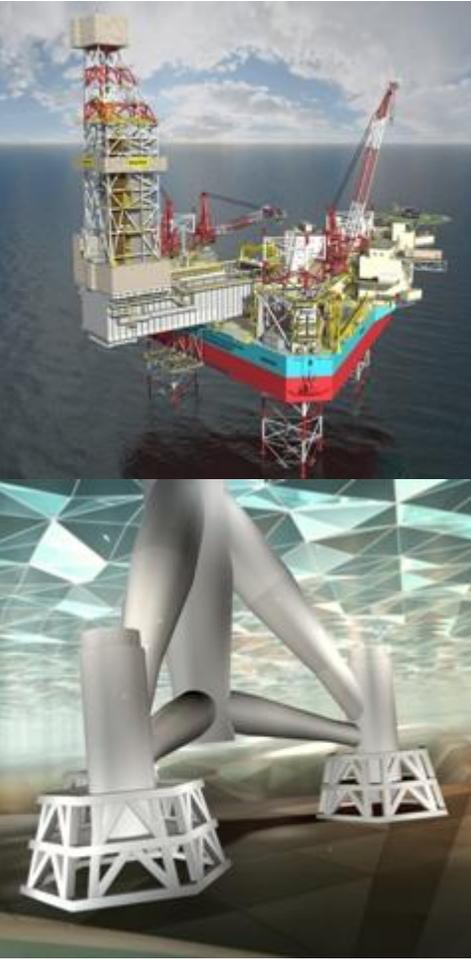
To get the required mechanical properties for this type of application, the tubes then go through a heat treatment step where they are "quenched and tempered". "Quenched" because the tubes, after being heated to 950°C in a furnace, are then immersed in a room-temperature water "bath", rapidly cooling them. This process hardens the steel. The tubes are then "tempered" by being reheated to a cooler temperature than during the quenching process, which reduces the weaknesses caused by quenching and develops the required mechanical properties.

Inspection

After air cooling, the tubes then go through a crucial non-destructive inspection step. They undergo a magnetic particle inspection. Iron powder is used to identify any cracks in the pre-magnetized tubes, which can then be repaired.

Polishing

When tubes are to be visible in a structure, and to help with their bending (a delicate process for curving the tube), as is the case with the Orly walkway, the exterior walls of the tubes are polished, a process known as "grinding". Grinding down the tubes by just a few tenths of a millimeter gives them a more aesthetically-pleasing appearance.



The "Industry" market of Vallourec

Tubes for construction are part of the Vallourec's industrial business, which accounts for 17.8% of the Group's overall sales revenue.

Vallourec's premium tubing solutions have been used in the construction of many pieces of infrastructure, including bridges, stadiums, and airports, among other bold architectural projects.

In this capacity, Vallourec has contributed to major, emblematic projects such as, in France, the Mont Saint Michel walkway and the Musée des Confluences in Lyon; the Burj Al Arab in Dubai; the Sony Center in Berlin; the New York Wheel; and renovations of Brazilian stadiums for the 2014 FIFA World Cup and the 2016 Olympics.

Products provided to customers in the industrial market can also be used for other applications such as automobiles, farming equipment, self-erecting offshore platforms, hydraulic cylinders, cranes, and PREON® marine foundation systems for offshore wind turbines.

STRUCTURAL TUBES Major world-class achievements



1. The Canopy of Les Halles in Paris (2016)
50 tons of structural tubes
2. The Mont Saint Michel walkway (2014)
400 tons of seamless steel tubes
3. Musée des Confluences in Lyon (2014)
532 tons of MSH sections
4. The Sony Center in Berlin (2000)
700 tons of premium steel tubes



5. The Grand Egyptian Museum (2016) next to Giza Pyramids - 1,340 tons of MSH sections
6. The « Mall of Qatar » in Al Rayyan (2016) - 475 tons of hot-rolled hollow sections
7. Burj al Arab in Dubaï (1999)
8. Suvarnabhumi Airport of Bangkok (2006) - 38,000 tons of MSH sections
9. The New York wheel (2016) - 10,000 tons of steel
10. Brazilian stadiums of Rio, Sao Paulo and Belo Horizonte (2016) - 10 500 tons of tubes