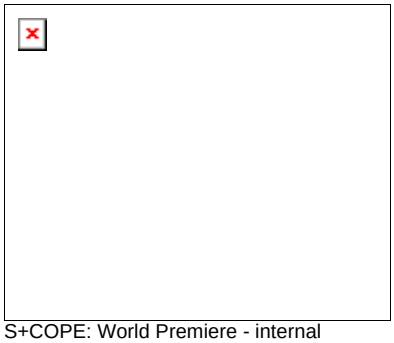
International Premiere for S+COPE: Centrispun Tubes with a Unique Internal Profile - a Revolutionary solution for Petrochemical Engineering

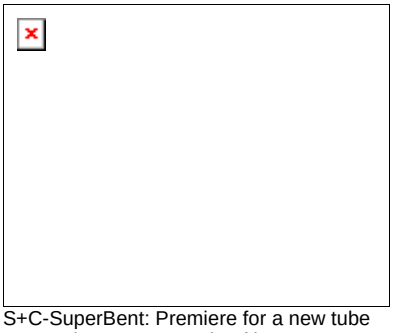
World premiere for two innovations from S+C at the international trade show ACHEMA in Frankfurt / Germany: In Hall 3, stand D 40 / F 41, from May 19 - 24, 2003 the global high alloy specialist company S+C introduces two new product lines as a world first, during the most important trade show for chemical technology. Under the name "S+COPE", the company has excited the international market with a completely new internal profile for centrispun steam cracker tubes. It also introduces for the first time ever, a new generation of centrifugal cast tubes, induction bent to very tight radii, to take the place of static cast fittings in steam cracker plants.



S+COPE: World Premiere - internal profiled centrispun tubes for energy-efficient applications in petrochemical plants.
Photo: Schmidt + Clemens

The S+COPE profile is the result of more than two years development and extensive field tests. It is characterised by its particular energy efficiency and long operational lifetime. The reason
for this is the specific profile geometry, which in combination with a special Ni-based alloy tube metallurgy (> 50% Ni), achieves a substantially improved heat transfer and a reduced tube metal temperature. This is despite an increased heat transfer area of only about 3%.

Thus S+C provides a number of benefits to plant operators: The cracker gas is mixed by a controlled flow pattern and therefore reaches its cracking temperature faster and more homogeneously. The heat energy applied to the outside of the tubes is utilised more efficiently and the temperature differences around the tube walls will be reduced, which leads directly to process acceleration and plant capacity improvement.



S+C-SuperBent: Premiere for a new tube connection system made of bent centrispun tubes. S+C-SuperBent is a substantial improvement compared to conventional static cast fittings.
Photo: Schmidt + Clemens

The second innovation is a very tight radii induction bent centrispun tubes - presented as SuperBent - which promises to be a significant improvement in plant engineering. SuperBent was developed to replace static cast fittings in steam cracker plants and includes a number of beneficial features.

S+C highlights the flexibility of this new product because the production of this new kind of tube connection eliminates the need for timeconsuming and costly pattern and static casting manufacture. Additionally, SuperBent provides a substantial weight reduction compared with conventional fittings. This can be used for less complex hanger systems and the weight reduction will reduce the creep rate of the straight tube legs. In addition, the number of welds in a steam cracker coil is reduced and the straight to bent tube welds are easier to make because of the similar material chemistry, microstructure and compatible wall thickness.

A significant improvement over conventional fittings, the inside of the bent tubes have a smooth machined bore surface so that a homogeneous gas flow can be expected in the straight tubes and also in the bends. An additional benefit is that bent as well as straight tubes are produced from the same furnace melts and therefore have exactly the same mechanical properties, carburisation and coking resistance. The bent tubes have a thinner, more constant wall thickness than static castings, which allows a better heat transfer and the improved bend radii minimises the erosion observed in conventional fittings.

In total, the uniform, tube wall thickness throughout the coil results in reduced system stresses. Therefore, the typical thermal fatigue rupture which occurs predominantly in thick-walled static castings can be excluded by such fine-grained centrifugal casting microstructure and uniform wall thickness.

Of course, Schmidt + Clemens also utilises the ACHEMA trade show to demonstrate its core competences in a wide variety of casting and forging technologies. Besides the centrifugal casting innovations for the Petrochemical industry, S+C also offers entire systems and special product

components for customers in the On-Shore and Off-Shore Industries, for recycling and separation plants and for conveyor and pumping as well as control technologies.

In doing this, Schmidt + Clemens utilises all its production sites, with manufacturing plants located in Europe, South America and Asia.

A truly global group providing outstanding service to every international market.

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