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COMPANY PRESENTATION

MODERN MATERIALS: BIMETALLIC TUBES

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Various products made of bimetals (kitchenware, busbars, rolled casing parts, and bimetallic tubes) are widely used in industry and everyday life. The rapid price rises seen in recent years for all metal products – especially those made of stainless steels – have forced most factories to make a difficult choice: use cheaper but lower-quality materials or enter into direct competition with foreign manufacturers. However, given that Russian factory managers are clearly oriented toward maximizing production, competing with technologically advanced industries in other countries is highly problematic. This can be simply illustrated by comparing the quality and cost of finished products made from the same materials by Russian manufacturers and foreign manufacturers. Thus, finding new materials that optimally combine cost and quality is one of the main ways that the competitiveness of Russian products can be improved and market share increased.

The technology used to make bimetallic tubes involves the application of a coating to a substrate – a pickled, cold-drawn carbon-steel tube with an outer layer made of stainless steel of the austenitic class 08Kh18N10 (AISI 304/DIN 1.4301). The outer layer of stainless steel is 0.1–0.8 mm thick, and the tubes are up to 6 m in length. The diameter and thickness of the walls can vary within broad ranges. The bimetallic tubes have good mechanical characteristics: ultimate strength 800–900 MPa; yield point 600–700 MPa; minimum elongation 30%.

The above-described technology ensures reliable bonding between the outer and inner layers of the tube, and its subsequent drawing guarantees the dimensional accuracy of the finished tube. It should be noted that the accuracy of welded tubes is considerably superior to that of seamless tubes. This is particularly noticeable in the production of complex structures that include fittings and adapters. The use of bimetallic tubes in place of standard tubes made of stainless steel is based on the fact that the former are much cheaper that the latter while offering the same quality and appearance.

The polished surface of bimetallic tubes is aesthetically pleasing. In terms of their characteristics, bimetallic tubes are intermediate between tubes of stainless steel and chromium-plated tubes. Bimetallic tubes are cheaper (30–35%) than stainless steel tubes and have better dimensional accuracy. They also are more accurate than chrome-plated tubes while being comparable in price and having greater resistance to corrosion.

Bimetallic tubes have found use in the production of guard rails, handrails, plungers, turnstiles, conveyors, and various types of structures. The use of bimetallic tubing becomes more advantageous as the thickness of the tube wall increases. The normal dimensions of bimetallic tubes are such as to be able to satisfy the requirements established by almost any type of design. Stuctures made of bimetallic tubes are assembled with the use of a special sealing adhesive that ensure reliable fastening of the components after clamping. The structures can be disassembled only by heating the compound to temperatures above 200°C. It is also possible to join structural elements to one another by means of stainless steel rivets. Welding is another possibility if the cladding layer is at least 0.3 mm thick.

The dimensions of bimetallic tubes are within the following ranges: outside diameter 10–76.2 mm; wall thickness 0.5–3.0 mm.

Modern manufacturing methods make it possible to produce tubes not only with an outer layer of stainless steel, but also an inner layer of this material. Such a structure makes the tubes resistant to heat and corrosion and thereby broadens their range of application: the chemical, pharmaceutical, and food industries, fuel handling, power engineering, and other areas.

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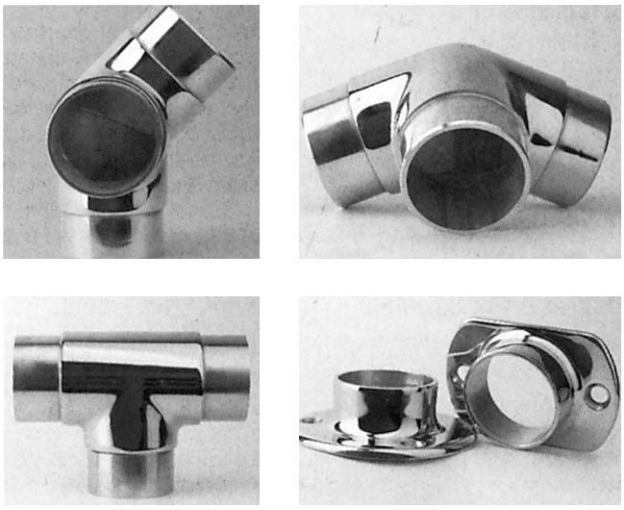

Fig. 1

Fig. 2

The company Special Steels and Alloys is the exclusive Russian representative of the factory in South Asia that makes bimetallic tubes for the Russian market and other CIS nations. Our partner is a leading manufacturer of bimetallic tubes, and the high quality of those products has been recognized by the awarding of certificates proving the tubes' compliance with the international standards ISO 9001 and ISO 9002. In addition to tubes, our company can also supply clients with fittings, adapters, and fasteners that have been specially developed for joining different components. These parts are physically attractive and have excellent mechanical characteristics.