

# Journal

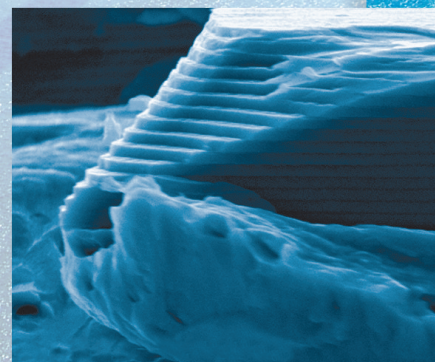
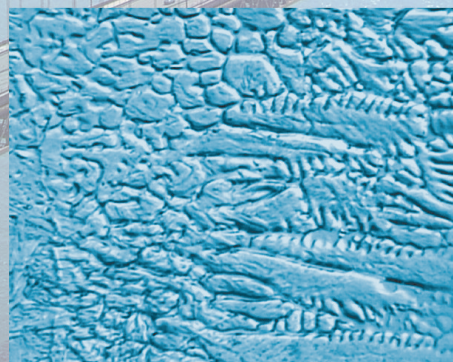
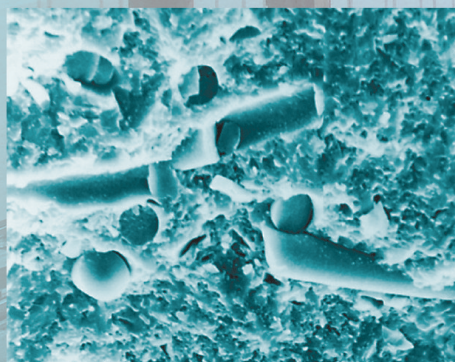
of Achievements in Materials  
and Manufacturing Engineering



Published monthly as the organ of the World Academy of Materials and Manufacturing Engineering

Editor-in-Chief Prof. Leszek A. Dobrzański

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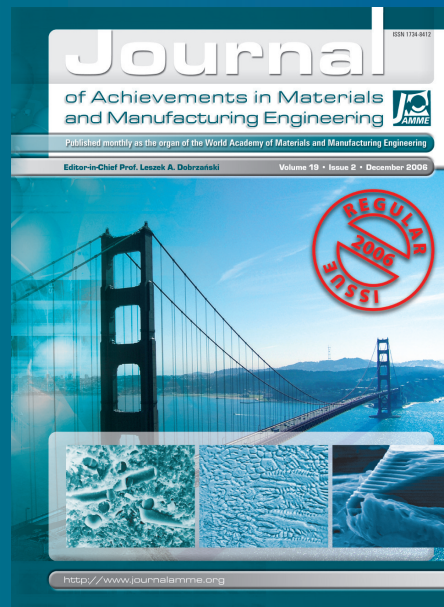
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## Cover story

A bridge is a symbol of connection. They have been built since ancient times. Then building material was of course stone. The first in the world Iron Bridge was built upon Severn in Coalbrookdale in England by Thomas Franolls Pritchard. The steel riveted two-level arch bridge upon Douro in Oporto in Portugal was built in 1872 by the A. Gustave Eiffel's company. The red steel cantilever bridge –Firth of Forth in Scotland comes from 1890. Ralph Modrzewski – a son of the outstanding Polish actress- built the first in the world suspension bridge of 530-metre-span in



1926 in Philadelphia, PA (USA). In Poland the Polish man, Prof. Stefan Bryła made the first bridge fully welded out of steel framework. Till today the arch Harbour Bridge in Sidney in Australia dated from 1932 designed by John Bradfield has been impressing with its construction. The contemporary bridge crossings joining the Continents are impressive – as two bridges upon Bosphor Strait in Istanbul in Turkey, in Patras in Greece – joining the Peloponnese Peninsula and continental Greece, the Humber Estuary Bridge near Hull in the Central England, between Pu Dong and Shanghai in China, Seto Ohashi in Japan or Gresundbron between Denmark and Sweden or Vasco da Gama Bridge upon Tag river in Lisbon in Portugal. All those bridges captivate by their beauty but also impress with the masterpiece of engineering design and the application of engineering materials being essential monuments of the level of material culture of our times. On the cover picture there is a full of grace intensely red-coloured Golden Gate Bridge in San Francisco, CA (USA). Today the specially outworked polymer paints which imitate the colour of minium, not used already because of toxic influence of lead compound are applied. The bridge put into use in 1937 is 2700 meters long and 27.5 meters broad and the present ca. 100 thousands cars pass by it every day. Each bridge line is 93 centimeters thick and consists of 27572 steel wires of a cable and general mass of all lines equals 95 thousands tones. That bridge captivates by its beauty and impresses with courage of creative engineering thinking. The bridge as a symbol of connection of two banks must be associated with all variants of cooperation among people, including also the international scientific cooperation so it can be also a symbol of series of the International Scientific Conferences CAM3S and AMME and generally of all the activities of the World Academy of Materials and Manufacturing Engineering. A connection makes a materials engineer think at once of all welding technologies including the most modern ones connected with the application of lasers, remelting and alloying and also surfacing by welding, soldering and pressure welding and other technologies of joining eg. in electronics and also adhesive methods including sticking. In micro- and even nanometric scale surely methods of the deposition of multilayer and gradient PVD and CVD layers where a few dozen and even over hundred of nanometric layers of thickness relying on even one atomic layer each can be created on thickness of 2-5 micrometers, can be referred. Mutual adhesion of those layers and also their surface adherence is ensured not only by adhesion but also as a result of diffusion. A special kind of connection is created by matrix and reinforcement in composite materials ensuring synergic connection of the properties of those two components of such materials and as a result very profitable and even unbeatable possibilities of the application of such materials. In the present issue of the Journal AMME some papers concern the subject matter of welding and connection of engineering materials – on pages **7** and **73**, composites – on a page **16** and coatings – on pages **35** and **86**.