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Since 21st July 2007 Burj Dubai (meaning in Arabic "Dubai Tower"), as a super tall skyscraper currently under construction in Dubai, United Arab Emiratem, becomes the tallest building on Earth surpassing Taipei 101 which stands at a height of 509.2 m. After pouring out concrete on 141st floor the skyscraper reached the height of 512,1 m. The previous day, the head of the Council on Tall Buildings and Urban Habitat (CTBUH), Anthony Wood, had confirmed that it "surpassed the height of Taipei 101 structurally (concrete)." However, he also added "We will not classify it as a building until it is complete, clad and at least partially open for business to avoid things like the Ryungyong project. Taipei 101 is thus officially the world's tallest until that happens." On 21st September 2004 Emaar contractors began construction of Burj Dubai. The building is not ready yet. Burj Dubai will be completed in late 2008. It is predicted to be the tallest man-made structure in the world. It is scheduled for occupancy in September 2009. Burj Dubai's last two milestones will be to surpass the 628.8 m height of the KVLY-TV Mast in North Dakota, United States to become the world's tallest structure and to pass the Warsaw radio mast in Gąbin, Poland (646.4 m until it collapsed in 1991) to become the world's tallest structure of any type ever built. When Burj Dubai is built, it will achieve the title of the record holder of the high in the following categories: to the highest top of the spire, to the height of the roof, to the highest laying floor. The predicted height of Burj Dubai will be ~818 m, a roof will be on ~643.3 m, and a top floor on ~624.1 m. Floor area will be ~334,000 m² and floor count will be 164. In February 2007 Burj Dubai surpasses the Sears Tower as the building with the most floors (110) at present. On 13th May 2007 Burj Dubai sets record for vertical concrete pumping on any building at 452 m, surpassing the 449.2 m to which concrete was pumped during the construction of Taipei 101. On 12th August 2007 Burj Dubai surpassed the height of the Sears' Tower antenna which stands at a height of 527.3 m. On 3rd September 2007 Burj Dubai becomes the second-tallest freestanding structure, surpassing the 540 m Ostankino Tower in Moscow, Russia. On 12th September 2007 (the day after the 6th anniversary of the demolishing of the World Trade Centre by terrorist attack) at 555.3 m, Burj Dubai becomes the world's tallest freestanding structure, surpassing the CN Tower in Toronto, Canada. On 10th December 2007 the steel construction of the Burj Dubai began. No more structural concrete is used in next steps of construction process of Burj Dubai. On 5th February 2008, Burj Dubai has reached a height of 604.9 m with 159 completed floors. As indicated above, the CTBUH does not recognise records for buildings still under construction, therefore some of those Burj Dubai's records are unofficial compared to current world records: tallest freestanding structure: 604.9 m (previously CN Tower – 553.3 m), building with most floors: 159 (previously Sears Tower – 110), vertical concrete pumping (for a building): 601.0 m (previously Taipei 101 – 449.2 m), vertical concrete pumping (for any construction): 601.0 m (previously Riva del Garda Hydroelectric Power Plant – 532 m).

Taipei 101 is a 101-floor world's tallest and at present completed landmark skyscraper, located in Taipei, Taiwan. The building received the Emporis Skyscraper Award in 2004. It has been hailed as one of the Seven New Wonders of the World (Newsweek magazine, 2006) and Seven Wonders of Engineering (Discovery Channel, 2005). Taipei 101 is managed by the International division of Urban Retail Properties Corporation based in Chicago USA. The original name planned for the building, Taipei World Financial Centre, derived from that of its owner, Taipei Financial Centre Corporation. On 21st July 2007 Taipei 101 was overtaken in height by the Burj Dubai in Dubai, UAE, upon the completion of that building's 141st floor. Taipei 101 retains the official title until the Burj Dubai is completed, though, as international architectural standards define a "building" as a structure that can be occupied. Taipei 101 has 101 stories above ground and five underground. Upon its completion Taipei 101 claimed the official records for: ground to highest architectural structure (spire): 509.2 m (previously held by the Petronas Towers 452 m), ground to roof: 449.2 m (formerly held by the Sears Tower 442 m), ground to highest occupied floor: 439.2 m (formerly held by the Sears Tower 412.4 m). Taipei 101, like all spire structures, participates in the symbolism of the axis mundi: a world centre where earth and sky meet and the four compass directions join.

On 14th September 2007 the Shanghai World Financial Centre, a skyscraper in Shanghai, China was topped out at 492 m and became the tallest structure in China, including Hong Kong, as well as the world's third tallest building (including unfinished ones). Shanghai World Financial Centre is built near the tower of Jin Mao in the financial district of the city. After many trials connected with financial problems, one of the longest built skyscrapers in the world, after 10 years it begins its final phase. Shanghai World Financial Centre has to be opened in the spring 2008. After the end of constructional works, there will be 377 300 m² of utilitarian surface in the building. It is a mixed use skyscraper which will consist of office spaces, hotel rooms, conference rooms, observation decks and shops. There will be huge parking areas, restaurants and conference centres on the first floors. On 7th to 77th floor offices will be organised. Between 79th and 93rd floor there will be 6-star Park Hyatt Shanghai. The hotel component will open with 175 rooms and suites in mid-2008. It will be the hotel situated in the highest place in the world. The great observation centre will be organised at last floors. 97 floor of the building is a great bridge where it will be possible to walk.

The Sears Tower is a skyscraper in Chicago, Illinois, USA. It has been the tallest building in the United States since 1973 to 1998, surpassing the World Trade Centre, which itself had surpassed the Empire State Building only a year earlier. The tower has 108 stories as counted by standard methods, though the building owners count the main roof as 109 and the mechanical penthouse roof as 110. The distance to the roof is 442 m, measured from the east entrance. In February 1982, two television antennas were added to the structure, increasing its total height to 520 m. The western antenna was later extended to 527,3 m on 5th June 2000 to improve reception of local NBC station WMAQ-TV. On 12th August 2007, the Burj Dubai in Dubai, United Arab Emirates was reported by its developers to have surpassed the Sears Tower in all height categories. It overtook the Sears Tower antenna (527.3 m) and from 5th February 2008, Burj Dubai stands at least 77,6 m taller (604.9 m) with 159 completed floors. At 452 m tall, including decorative spires, the Petronas Towers in Kuala Lumpur, Malaysia, laid claim to replacing the Sears Tower as the tallest building in the world in 1998.

Cover story – continued

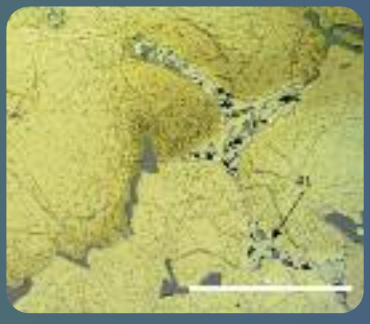
Not everyone agreed, and in the ensuing controversy four different categories of "tallest building" were created. Of these, Petronas Towers were the tallest in one category (height to top of architectural elements, meaning spires but not antennas). However, before the addition of the Sears Tower's own two antennas in 1982, One World Trade Centre was taller by height to top of its 110 m antenna (added in 1978 to its previous 417 m height). Taipei 101 in Taiwan claimed the record in three of the four categories in 2004 to become generally recognized as the tallest building in the world. Taipei 101 surpassed the Petronas Towers in spire height and the Sears Tower in roof height; it also claimed the record for highest occupied floor. The Sears Tower retained one record: its antenna exceeded the Taipei 101's spire in height. The Sears Tower remained the tallest office building in North America, and retains the world record when measuring from sidewalk level of the main entrance to the top of the antenna. When completed, the Freedom Tower in New York City is expected to surpass the Sears Tower through its structural but not occupied peak. Burj Dubai, currently under construction in Dubai, claims world records in a number of categories, surpassing the Sears Tower, Taipei 101 and the CN Tower unofficial just.

The Petronas Twin Towers (also known as the Petronas Towers or Twin Towers), in Kuala Lumpur, Malaysia were the world's tallest buildings from 1998 to 2004 if measured from the level of the main entrance to the structural top, the original height reference used by the Council on Tall Buildings and Urban Habitat from 1969 (three additional height categories were introduced as the tower neared completion in 1996). The Petronas Twin Towers were the tallest buildings in the world until Taipei 101, as measured to the top of their structural components (spires, but not antennas), took over the record. Spires are considered integral parts of the architectural design of buildings, to which changes would substantially change the appearance and design of the building, whereas antennas may be added or removed without such consequences. The Petronas Twin Towers remain the tallest twin buildings in the world. The Sears Tower and the World Trade Centre towers were each constructed with 110 occupied floors – 22 more than the Petronas Twin Towers' 88 floors. The Sears Tower and the World Trade Centre's roofs and highest occupied floors substantially exceed the height of the roof and highest floors of the Petronas Twin Towers. The Sears Tower's tallest antenna is about 76 m taller than the Petronas Twin Towers' spires. However, in accordance to CTBUH regulations and guidelines, the antennas of the Sears Tower were not counted as part of its architectural features. Hence, surpassing the roof of the Sears Tower by 10 m.

In January 2008 it was announced that soon in Moscow, the capital of Russia, the biggest building as ever was built in the World will be created. Its users will be able to live and work in one building which will be a huge entertainment and cultural centre, not only residential building. That building will be located near a huge park thanks to which its form will contrast in an interesting way with natural flora, and its inhabitants will have an easy access to green areas, both in summers and winters. The investment was preliminary accepted and will be finished within next five years. Crystal Island, because such a name was given to that building, is without any doubt the most ambitious building enterprises in the human history. Surely such a great building will change the way of thinking about skyscrapers and contemporary town planning. The building will be 450-metre-high and occupy the surface of ~500,000 m^2, and the total floor surface will achieve ~2,500,000 m^2. In the building 900 luxury apartments are to be in the building, 3000 hotel rooms and also a theatre, a show room, shops and a school for 500 students coming from families living there. Also two viewing areas will be organised there. A known designer, Norman Foster who leads the most prolific architectural office in the world and is a main author of that project, said: "Crystal Island (...) will be the biggest building in the World, (...) which points out new standards in designing compact, multifunctional buildings concentrated on town planning and environmental protection thanks to innovational strategies and intelligent projects of isolation which can protect against even the most extreme climate.."

On the cover of the given issue of JAMME the picture of the Petronas Twin Towers in Kuala Lumpur, Malaysia and on the small pictures Burj Dubai in Dubai, UAE (under construction), Taipei 101 in Taipei, Taiwan and Shanghai World Financial Centre, a skyscraper in Shanghai, China (under construction) are placed, and below that cover story Sears Tower in Chicago, Illinois, USA, Pudong sphere in Shanghai, China with numerous skyscrapers and the view of Victoria Island in Hong Kong, China with numerous skyscrapers are presented. All those buildings prove mastering of knowledge about the construction of skyscrapers which history began from the project of Home Insurance Building in 1885 by William LeBaron Jenny in Chicago, Illinois, USA, and mastering materials science and engineering thanks to which those projects could be realised.

Selected materialographical photo



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The Materials section represented by L.A. Dobrzański, M. Krupiński and B. Krupińska on "Structure analysis of Al cast alloy" on a **page 23** presents that the developed design methodologies both the material and technological ones will make it possible to improve shortly the quality of materials from the light alloys in the technological process, and the automatic process flow correction will make the production cost reduction possible, and - first of all - to reduce the amount of the waste products. Castings were analysed in the paper of car engine blocks and heads from the Al-Si-Cu alloys of the AC-AlSi7Cu3Mg type fabricated with the "Cosworth" technological process. In this work the AC-AlSi7Cu3Mg alloy structure was investigated, of this alloy samples were cut of for structure analysis of the cylinder part as well of crankshaft of a fuel engine. The investigation show a difference in the (phase) structure morphology as a result of cast cooling rate. The value of the applied methodology was to correct identify the casting effects that occurred during the casting process.

Manufacturing and processing

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