

Sustainability: "BSB" is the abbreviation for BROAD sustainable building (factory-made). Sustainability is derived from 8 aspects: earthquake resistance, energy conservation, air purification, durability, material saving, recyclable construction materials, construction materials free of formaldehyde, lead, radiation & asbestos and no construction sewage, dust or wastes. BSB has accomplished the extremity of these 8 aspects that today's human technologies can ever imagine.

Magnitude 9 Earthquake Resistance: BROAD was a central air conditioning manufacturer who exported its products to over 70 countries. We developed sustainable buildings due to Wenchuan Earthquake in 2008. One year since the earthquake, a team of 300 BROAD researchers has done hundreds of testing, and then invented combined earthquakere-sistance technology of "steel structure + diagonal bracing + lightweight". China Academy of Building Research conducted earthquake resistance tests for 7-storey and 30-storey sustainable building simulators scaled at 1:4 & 1:10, and accurately verified that earthquake resistance of BROAD Sustainable Building is 3~12 times higher than that of conventional buildings in the world (Magnitude 6~7, 0.05~0.12g on average; Magnitude 8, 0.22g highest).

5X More Energy Efficiency: BSBs adopt at least 30 different energy saving technologies. Ordinary people can understand thick thermal insulation of exterior wall & roof, multi-paned windows, external solar shading, heat recovery fresh air, LED lighting, power generation by elevator descending & water-saving toilets. Most countries in cold areas adopt 10cm thermal insulation & double-paned windows, whereas BSBs adopt 35 cm thermal insulation and 5-paned windows; in warm winter and hot summer areas as well as torrid areas, most countries use only 3 cm thermal insulation or no thermal insulation at all, whereas BSBs adopt 15 cm and 3 or 4-paned windows. Another significant energy-saving technology of BSB comes from BROAD-invented heat recovery fresh air system. By exchanging heat between outdoor fresh air and indoor exhaust air, it recovers 70%~90% of energy and ensures extreme freshness of the indoor air of BSBs with little energy loss. If we convert the HVAC energy consumption of buildings around the world into oil, it equals 35~70 L/ m²a, whereas BSBs is 7~12 L/m²a, which is 5 times more energy efficient.

20X Purer Air: Air purification is the most crucial technology to each household. For it is closely related to people's life expectancy and various kinds of human diseases. WHO certifies that 68% of human diseases are related to indoor air pollution. However, the value of air purification can be ignored most easily, because air pollution is invisible to naked eyes. We install air quality detectors in each room, residents can check the indoor PM (PM0.3, PM2.5 and PM10), formaldehyde and CO₂ level at any time and can at the same time compare with the outdoor PM. In common people's opinion, this detector seems to be so expensive that a public debate needs to be held on whether a country should invest a few sets of PM2.5 monitoring devices for each city. But BROAD installs a detector in every room. It's definitely a technological revolution for the miniaturization and cost-lowering R & D process, which is like putting a building-like computer some decades ago into a small cellular phone today.

Another challenge is how to actualize "super filtration ". At present, for the whole world, only IT chip assembly lines and surgical operating rooms are using "super filtration" equipment that is even more costly than the building itself. Nevertheless, BROAD invented a low-cost "super filtration" technology and integrated it into the heat recovery fresh air machine. It is a combined system with 3-stage filters. The first stage adopts the traditional coarse filter, collecting big particles; the second stage utilizes BROAD-invented "electrostatic cleaner", following the principle of "positive attracts negative" to filtrate 98% of PM0.3, PM2.5 & PM10, and then the remaining PM is filtrated by expensive "HEPA filters". The final air filtration efficiency can be as high as 99.8%. When the fresh air is completely purified, PM can only be brought in by people from outside. Therefore, indoor air is at least 20 times purer than outdoor air.

Factory Made: The most revolutionary element about BSB is its construction mode: a 3.9x15.6m "main board" including flooring and ceiling, embedded shafts of ventilation, water supply & drainage, electricity and lighting. All needed pillars, diagonal bracings, doors, windows, walls and even sanitary & kitchen wares for the room installation are placed on main board for factory shipment. One truck can carry 120m² main boards and then deliver them to the construction site to be hoisted in installation place. What all workers need to do is just screwing bolts, painting.....Such a high-efficiency construction mode makes on-site installation only account for 7% of the total construction hours. Therefore, BSB can be 93% factory-made, whereas the current world's highest is only 40%.

Amazing: When hundreds of millions of people were amazed at the video of a 30 story hotel building being built in 360 hours (see YouTube time-lapse video at <http://www.youtube.com/watch?v=Hdpf-MQM9vY>) in the second week of 2012, most of them were still not aware of the more amazing figures hidden behind the building in the video:

- 9 magnitude earthquake resistance, compared with conventional buildings, the steel consumption is 10~20% less and concrete consumption is 80~90% less.
- 5 times energy efficiency, 20 times purer air, 10%~30% lower in cost than that of conventional ones.
- Low cost, while the building automation level is even higher than that of the most advanced smart buildings in the world.
- Amazing construction speed, while zero injury during construction process.
- Perfect construction quality, while no fire, no water & no dust (no welding, no concrete, and no polish with emery cloth), construction waste is less than 1% of that of conventional buildings.
- We built the 30-storey hotel in 360 hours just to avoid the rainy season. However, building a starred hotel with 700 beds from ground breaking to opening in 48 days is definitely a miracle!

Established in March, 2009, BROAD SUSTAINABLE BUILDING CO., LTD is a wholly-owned subsidiary of BROAD Group. BSB headquarters and its R&D Center are situated in Xiangyin County of Hunan Province in Southern China, with 80,000sqm workshops, 900 employees in 2011. In 2012 with 220,000sqm workshops, 12,000 employees, and in 2013 with 360,000sqm workshops and 19,000 employees, it can reach an annual production and installation capacity of 10 million sq m. By December, 2011, BSB technology reached finalization, altogether with 12 BSBs built in Changsha, Xiangyin, Shanghai, Zhejiang and Mexico and developed 2 franchise partners in Ningxia and Fujian with identical factory sizes to the Xiangyin BSB Factory. Another 10 Chinese & international potential partners are in negotiation.

30 story hotel building was built in 360 hours, 48 days from groundbreaking to opening

