Development of Modular Wooden Buildings with Focus on the Indoor Environmental Quality

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Summary:

During the last three decades there has been increasing concern within the scientific community about the effects of indoor air quality on health. Changes in building design devised to improve energy efficiency and has induced that modern homes and offices are frequently more airtight than older structures. Furthermore advances in construction technology have caused an extensive use of synthetic building materials. The construction process and the production of building materials not only consume the most energy they also have a big impact on the Global Warming Potential. While these improvements have led to more comfortable buildings with lower running costs, they also provide indoor environments in which contaminants are readily produced and may build up to much higher concentrations than outside. Because about 80-90% of our time is spent indoors, where we are exposed to chemical and biological contaminants and possibly carcinogens, the Indoor Environmental Quality plays an increasing role. The aim of this study was to develop building components out of sustainable natural materials for modular building concepts with regard to the Indoor Environmental Quality such as the air quality and the indoor climate, the temperature and humidity. To guarantee high Indoor Air Quality a mechanical ventilation system is part of the construction. It has to ensure a controlled air change with a minimum of dissipation of energy. Building parts were assembled to meet high energy efficiency Standards. For the construction parts wood, hemp, sheep wool and clay were used to meet the settled requirements. As a first result of this study two modular buildings were erected, in which the indoor air quality and the construction physics will be monitored in the next few years for generating valuable data.

Online Access:	Free

Resource Link

http://schd.ws/hosted_files/wcte2014/60/ABS038_Flach_web.pdf