Building Castles in the Air

Wide spanning roof structures covering huge stadiums supported by ultralight beams of air are no longer only wishful thinking. TENS AIRITY®, the clever synthesis of compressed air, cables and struts, makes the impossible possible. A first car bridge demonstrates the advantages of this new and patented technology.

A cylindrical membrane filled with compressed air is a very light and deployable beam. However, the load bearing capacity of such a simple air-beam is so small that useful applications are restricted to weightless places: space. In fact, the simple air-beam is lacking a backbone and cables to hold it all together. Struts and cables are therefore exactly the elements that TENS AIRITY® adds to attain ultralight structures as strong as steel.

The protected brand name TENS AIRITY® indicates the close relationship to the delicate structures known as Tensegrity. In these structures, tension and compression are physically separated into cables and struts making the struts appear to be freely floating. In Tens-air-ity structures, compressed air is added as a third element. Cables, struts and compressed air complete each other perfectly. The result is a modified air-beam with the same load bearing capacity as a steel beam but with a weight reduction up to a factor of ten.

Ideal applications of the TENS AIRITY® technology are wide spanning roof structures e.g. for stadiums, manufactory plants and squares, for the advantages of TENS AIRITY® over traditional steel constructions gain more and more weight as span increases. Due to TENS AIRITY® being easy to handle and to transport, it is furthermore the ideal technology for temporary buildings such as tents for sport or other open-air events, since TENS AIRITY® beams are like simple air-beams deployable, too.

Small weight, compact storage and fast set up turn the TENS AIRITY® technology into the perfect choice also for temporary bridges, where local loads can be much bigger than for roof structures. However, TENS AIRITY® can easily withstand these loads as we have proved through a small car bridge. This technology platform is our first successful realisation of this revolutionary new technology.