

Categorie Premio
Accessibilità
Sostenibilità
Qualità della vita
Product Name Membrane Concrete Grid Shells (Membran Beton Gitterschalen Tragwerke – MBGT)

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<p>Description of innovation social values</p> <ul style="list-style-type: none"> - product category - formal and functional features - problems solved by innovation - user - field of application 	<p>ECO-FRIENDLY CONSTRUCTION AND MATERIAL</p> <p>Membrane Concrete Grid Shells are combining the advantages of traditional technologies (membrane formwork) and new materials (ultra high performance concrete) and thus are leading to absolutely fast buildable, economical and ecological structures. Field of application could be emergency accommodations, hospitals, social assembly points, storages as well as simple shelters.</p> <p>Airforms and membrane formwork are a traditionally used for building monolithic, spherical domes (known since 1940). Thus the secondary, formgiving construction with steel or wood is dispensable: costs and time could be saved. Ultra High Performance Concrete is a new material with a strength like steel. By using this material, structures could be very filigree. The amount of concrete that will be needed to cover a spherical dome could be reduced. By using the membrane formwork and generation of a grid shell, further concrete could be saved. Ecologically, up to 60% concrete could be saved. With a special technology, it is possible to create a 'UHPC' with local resources, thus the material must not be imported. Alternatively it is possible to produce - with local resources - a 'green concrete' with 30% less cement or to use a complete different self-hardening material.</p> <p>Compared to the 'traditional' monolithic domes, the new construction system and method allows to generate new designs, that where not possible so far.</p>		
<p>Description of technical features</p> <ul style="list-style-type: none"> - operations - technology 	<p>Innovative is the usage of fibre reinforced Ultra High performance Concrete (UHPC) in combination with air supported membrane chambers respective membrane mold. Two PVC coated fabrics (membrane) are layered and directly connected via welding. The first membrane acts as an air-hall and airform with chambers that are defined thru the second layer. Thus, it is possible to generate a continuous chamber system and coeval a geometry for the concrete grid shell. Pumping UHPC from bottom-up fills the chamber system.</p> <p>Because of the very simple construction, the high compression and flexural strength of the UHPC, nearly every kind of concrete grid mesh on a pneumatic form-giving surface is possible. After the concrete is hardened (1-2 days), the inner pressure could be removed. Meanwhile, the interior of the construction could be used.</p>		
<p>Dimensions</p>	<ul style="list-style-type: none"> - 3m x 3m x 3m up to - 80m x 80m x 40m (not realized yet) 		
<p>Materials</p>	<ul style="list-style-type: none"> - PVC coated fabric - Air - Ultra High Performance Concrete (UHPC), midget - fibre reinforced 		
<p>Certifications</p>	<ul style="list-style-type: none"> - Due to it's a brand new construction system, certification for individual cases are required (Germany) - General certifications are not feasible. 		
<p>Benefits for environment</p>	<ul style="list-style-type: none"> - Saving resources: Less amount of concrete (and thus cement and CO2 reduction) compared to conventional shells; no secondary steel or wood construction needed. - Reduction of Transportation and thus CO2 - Small building site equipment needed; surrounding environment is preserved - High durability of the construction thus renovations are not required - Membrane could be recycled; Concrete could be recycled 		
<p>Benefits for human being</p>	<ul style="list-style-type: none"> - Stable emergency accommodations buildable within a short time - Rearrangement of a village-structure within a short time - Construction of big shells for hospitals, congregation spots and infrastructure - Constructions could be covered with second façade for permanent dwelling - Economic for aid organizations 		