NPS® by Tecnostrutture®

your GREEN BUILDING SYSTEM

TECNOSTRUTTURE AND DGNB

tecnostrutture.eu

Technical
support by

MDS
MACRO
DESIGN
STUDIO

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INTRODUCTION

Tecnostrutture® s.r.l. was founded in 1983 as a business operating in the public and private construction industry. Specialised in the reinforced concrete prefab industry, the company began to produce metal trusses in 1984, developing its own technologies, calculation processes and production.

In 2013 Tecnostrutture launched New Performance System NPS®, an integrated offsite construction solution, consisting of beam, column and slab. In 2014 he patented AirfloorTM, the lightest composite slab on the market. Innovative for its self-supporting capacity up to 5 meters, speed and ease of installation.Producing and supplying NPS® precast components, Tecnostrutture s.r.l. also offers the technical support of its engineering staff. Tecnostrutture strives to simplify and organise work in the work site by developing an industrialisation of construction that guarantees the customer fixed times and costs, greater safety and cutting-edge technology. These are the factors that have allowed Tecnostrutture to take part in and often be the protagonist of building large infrastructures, tertiary and residential projects.

Tecnostrutture has its main headquarters at Noventa di Piave in the province of Venice. In 2011, it inaugurated its representative office in Germany, with reference to central and northern European markets.
Production activity to create the metal structures takes place at Noventa di Piave (Venice), at two plants. Further two plants are dedicated to the production of concrete footing used by a few types of NPS® Beams. Another site is reserved for the spinning of NPS® PTC® Columns made with high performance concrete. A further plant is located in southern Italy in Corigliano Calabro.

Tecnostrutture is a member of the Italian Seismic Engineering Association, a supporting member of EUCENTRE (European Center for Training and Research in Earthquake Engineering), a member of the Italian Association for Sustainable Infrastructures, of the Green Building Council Italy and of the Council of Tall Building and Urban Habitat.

TECNOSTRUTTURE VALUES

Knowledge, Robustness, Timing and Essentiality are the values that guide us every day in contributing to the evolution of the construction sector and the improvement of people's quality of life.

Culture
Curiosity, courage and ambition make us active players in our sector, in spreading a new culture of building. Research and development, carried out together with reference technical-scientific partners, allow us to go beyond the limit of current knowledge, breaking traditional patterns.

Timing
We have adopted an active attitude towards time, giving it the right value. We work fast to achieve the defined objectives, and with precision to attain optimal results. Our operational approach integrates transversal skills, which translates into simple, fast and efficient project execution.

Robustness
Experience, resilience and vision are the solid pillars on which our work is based. Always being at the forefront in creating durable solutions that challenge time and space: this is the approach with which we guarantee safety and reliability to our customers.

Wesentlichkeit
The essential and minimalist style in building, working and living to which we aspire, is contained in our guiding principle "less is more".
In a sustainable way, through a conscious and optimal use of resources, we reduce instead of adding, generating simplicity where there is complexity, valuing only what is necessary and essential, thus achieving our ultimate goal of improving people's quality of life.

SUSTAINABILITY OF CONSTRUCTION PRODUCTS AND DGNB CERTIFICATION

This document analyzes the sustainability characteristics of Tecnostrutture® products which contributes to obtain the criteria relating to:
• DGNB SYSTEM NEW CONSTRUCTION, Version 2020 international protocol.
• DGNB SYSTEM GEBAUDE NEUBAU, Version 2018

To make sustainable building applicable on a practical level, measurable and thus comparable, the DGNB has developed its own certification system. This system offers a variety of options for buildings, indoor environments and districts – not only for new buildings but also for existing ones. The DGNB System works like a planning and optimisation tool, providing help with raising the tangible sustainability of building projects. It also fosters a shared understanding of the pertinent requirements of sustainable building methods, among all parties involved in development projects. Certification should make an essential contribution to quality across the board in planning, construction and actual use. By reducing risk and the costs associated with it, applying the DGNB System helps tailor building projects to needs on the horizon. An important part of this is our independent certification process, which adds transparency to quality controls. The DGNB Certificate is granted in Platinum, Gold or Silver, so it can also be used as an award and marketing instrument. The DGNB System is based on three fundamental factors.

These set the approach apart from other certification systems in the market:
• Life cycle assessment
• Holistic approach
• Emphasis on performance

TECNOSTRUTTURE® - SUSTAINABLE SOLUTIONS

Tecnostrutture® analyzed products

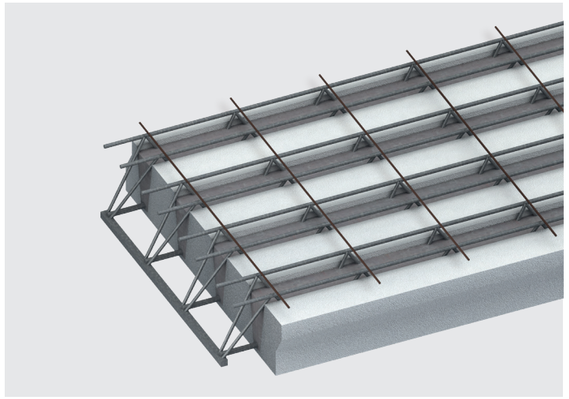
AIRFLOOR™ SLAB

> Link to our website

The lightest slab on the market. It ensures thermal insulation; it is fast to be placed and meets every project requirement.

With max. 45 kg/m^2, Airfloor® is self-supporting up to 5 meters. The EPS (airpop) layer offers thermal insulation and works as casting formwork.
The placement is easy: panels fit together thanks to the structural protrusion of the slab. Casting can start immediately without need for additional nets. The basis Is smooth, without downstanding and equipped to accommodate false ceiling.

Airfloor® has been patented by Tecnostrutture s.r.l.



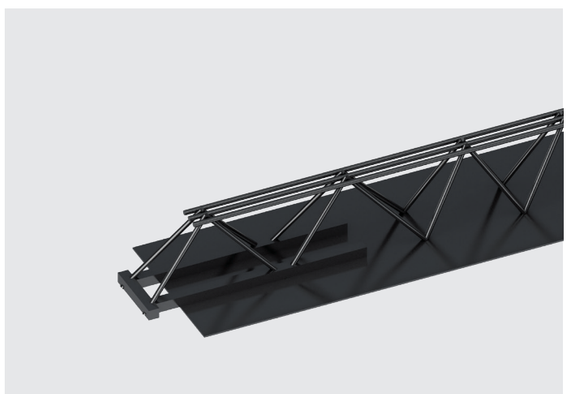
BENEFITS
- The lightest selfsupporting slab on the market
- Self-supporting
- Slim floor, beam-slab without downstanding
- Suitable for drawing needs
- Fire resistant with proper finishing
- Thermal insulation
- Easy and fast placement
- Equipped to accomodate false ceiling

AREAS OF USE
- Residential
- Offices and Shops
- Renovations/Upward extentions
- Highrise buildings

NPS® BASIC BEAM

The self-bearing composite steel truss and concrete NPS® Basic beam is recommended for structures with large spans, residential and industrial buildings, and for infrastructure.

The metal structure, made of structural steel pursuant to Standard UNI EN 10025-2 and with EN 1090-1 CE marking is composed of:
- lower chord formed by a plate and possible additional rebar soldered to it;
- upper chord formed by at least one pair of profiles;
- connection web, simple or double, soldered to the upper and lower chords;
- appropriately sized support terminals, which serve as anchoring devices, resist sliding actions.



NPS® CLS BEAM

The self-bearing composite steel truss and concrete NPS® CLS Beam offers integrated fire resistance in conformity to Eurocode 2-2. It is ideal for fire-resistant structures with large overloads and/or spans; it is particularly suited to coupling with hollow core slab or slab ceilings.

The metal structure, made of structural steel (UNI EN 10025-2), with EN 1090-1 CE marking, is made of one or more trusses welded using metal active gas welding (Process UNI EN ISO 4063-135).
The lower chords are inserted in a class C28/35 concrete footing (UNI EN 206-1:2006), precast and equipped with reinforcement and surface reinforcement sized to support the load of the heavy ceilings on NPS® Cls Beam.

PILLAR NPS® PDTI®

Recommended for construction in seismic zones, and to make the best use of space thanks to the compactness of sections with the same required performance, for structure ductility and beam-column node confining. It is suitable for infrastructure, major projects, and just as it is for residential buildings.

EN 1090-1 CE marked, NPS® PDTI® is comprised of metal profiles with circular, square or rectangular sections, usually filled with concrete. It joins the versatility of a metal structure in the provisional phase with the resistance of a composite steel-concrete structure in the working phase. It can be supplied with helical or vertical welding, and if requested in a multi-story version, even with a differentiated section for each interfloor.

PILLAR NPS® PTC®

Ideal as a design component thanks to its numerous color finishes, polishing or chrome plating. It is recommended exploit available space to the fullest, thanks the compactness of its sections given the same required performance.

With UNI EN 13225 CE marking, the patented NPS® PTC® Column is realized using spun concrete for high performance, up to class C70/85.
The spinning treatment allows a reduction in the structural section, with resulting benefits in terms of usability of space, a greater bearing capacity compared to traditional structures and extremely homogenous surfaces.

Tecnostrutture® contribution towards DGNB rating systems

The sustainability quality of Tecnostrutture® products is recognized through the certifications of its characteristics and its contribution towards the requirements of DGNB rating system. Here the main sustainability indicators of Tecnostrutture® products and relevant criteria of DGNB SYSTEM NEW CONSTRUCTION, Version 2020 international protocol and DGNB SYSTEM GEBAUDE NEUBAU, Version 2018 rating systems that these characteristics contribute to.

Envionmental Quality ENV1.1 Building Life Cycle Assessment

DGNB SYSTEM NEW CONSTRUCTION, Version 2020 international

Objective	The objective is to ensure a consistent life cycle approach to the planning of buildings in order to reduce emissions related impacts on the environment and consumption of non-renewable resources to a minimum across all stages in the life of a building.
Requirements	An Environmental Product Declaration (EPD) in accordance with DIN EN ISO 1402 and DIN EN 15804 for the specific method of energy production can be used.
Contribution of Tecnostrutture	The availability of the EPD relating to the products permanently installed on site allows for a detailed analysis of the life cycle of the building. Tecnostructures products with EPD: - NPS® PDTI® pillar - NPS® PTC® pillar - Airfloor™ slab - NPS®- beam (in the variants with or without sides)

Environmental Quality ENV 1.2 Local environmental impact

DGNB SYSTEM NEW CONSTRUCTION, Version 2020 international

Objective	The objective is to reduce, avoid or substitute all dangerous or damaging materials, (construction) products or preparations that can adversely affect or cause short, medium or long-term damage to people, flora and fauna.
Requirements	1. Load-bearing and nonload-bearing metal components for indoor applications with > 50 m² coated surface (Factory and building site) Requirements: Fire safety coating for metal components VOC, emissions and halogens VOC definition in accordance with Directive 2004/42/EC (VOC content) ISO 11890-2 2. Load-bearing metal components (wall thickness > 3 mm) with > 500 m² coated surface in the building such as atrium construction, bridges, etc. (Factory and building site) **Requirements**: Corrosion protection coatings for internal component (max. Corrosion classC2 according to ISO 12944), VOC, VOC definition in accordance with Directive 2004/42/EC 3. Load-bearing metal components (wall thickness > 3 mm) with > 500 m² coated surface such as atrium construction, bridges, etc. (Factory and building site) **Requirements**: Corrosion protection coatings for components (max. Corrosion class C3 according to ISO 12944), VOC, VOC definition in accordance with Directive 2004/42/EC 4. Load-bearing metal components (wall thickness > 3 mm) with > 500 m² coated surface such as atrium construction, bridges, etc. (Factory and building site) **Requirements**: Corrosion protection coatings for components (Corrosion class higher than C3 according to ISO 12944), VOC, VOC definition in accordance with Directive 2004/42/EC
Contribution of Tecnostrutture	Upon request, Tecnostrutture can use credit-compliant products and issue specific declarations on this.

Envionmental Quality ENV 1.3 Sustainable resource extraction

DGNB SYSTEM NEW CONSTRUCTION, Version 2020 international

Objective	The objective is to promote the use of products in buildings and their external installations that are transparent with regard to their environmental and social impacts throughout the value chain and utilise raw material extraction and processing methods that comply with recognised environmental and social standards.
Requirements	Recycling is an alternative option for reducing extraction of primary raw materials and the associated impacts. For this reason, the use of post-consumer secondary raw materials and pre-consumer secondary raw materials (which should demonstrably come from external sources; pre-consumer in-house recycling cannot be taken into account) in the building is also evaluated positively.
Contribution of Tecnostrutture	Tecnostture products equipped with EPD (NPS PDTI pillar, NPS PTC pillar, Airfloor floor, NPS beam in the variants with or without sides) report information on the recycled content, useful in contributing to the documentation of this criterion.

Technical Quality TEC 1.6 Ease of Recovery and Recycling

DGNB SYSTEM NEW CONSTRUCTION, Version 2020 international

Objective	The objective is to ensure highly economical and efficient use of natural resources. Accordingly, we promote solutions that enable pre-existing value to be made reusable with a minimum of loss. In accordance with our goal of reducing the amount of primary resources required for construction and maintenance of buildings to virtually nothing, we strive to create a strategy to increase the current level of material efficiency – the purpose of which is to enable materials to be recycled with effectively no losses, in conjunction with a significant reduction in the materials used. To this end, the “Ease of recovery and recycling” criterion aims to address one of the most important issues for the DGNB: Creating a “Circular economy” that enables participants and users to reduce consumption of natural resources to a minimum and ideally to completely avoid consumption of natural resources, in order to ensure that once we have used resources for our own purposes, they will continue to be available to future generations to the highest extent possible – enabling those generations to develop in a way that ensures their well-being.
Requirements	**Documentation for quality level 2**: Declaration by the/a manufacturer or a disposal company, or plausible statement by the auditor specifying a reliable external source (e.g. EPD) indicating that material recovery is normal for the building component/building sub-component/product and can be carried out with currently available technology.
Contribution of Tecnostrutture	On request, declarations can be made regarding the disassembly and end-of-life of Tecnostrutture-products.