



DX – the ceiling system
dry, individual, fast and innovative



Dry



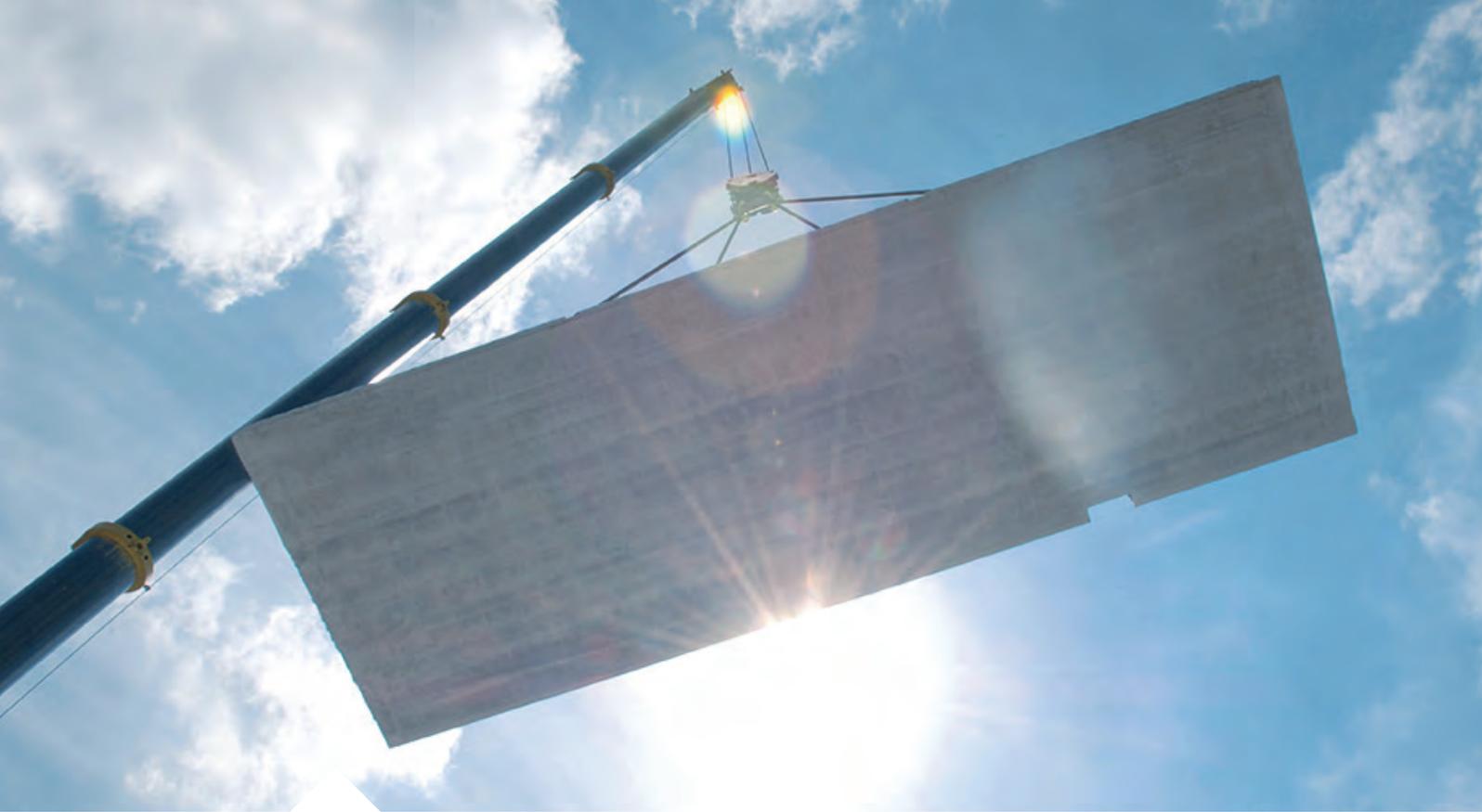
Living Climate



Fast



Top sound insulation



 **DX** CEILING – the original since 1978

The source of innovative ideas A successful prefabricated ceiling

The vision of founder Veit Dennert was to make building houses, faster, easier and safer. Already in 1978, with the prefabricated DX ceiling has been developed and continuously improved to this day.

Building with Dennert means: to almost entirely relocate the construction process into the factory halls. Halls with constant conditions ensure the high quality. The concrete mix, the temperature and the duration of the drying process are subject to permanent and continuous monitoring.

The DX ceiling is produced regardless to any weather condition and is delivered to the construction site just in time. The well trained assembly teams will install the DX ceiling on-site in only a few hours.

As a medium sized family-business with over 80 years of experience, Dennert offers a modern and prefabricated Ceiling-System. Over the past 35 years the DX-System has proven itself over a million of times, and has already been implemented for various requirements. On the following pages you will experience Germany's most successful prefabricated ceiling system.

The milestones of the DX ceiling

Over 18 million square meters since 1978

For decades, the DX ceiling system, which has proven itself with over 18 million produced and sold square meters, is produced under permanent quality monitoring. The DX ceiling meets almost every demand an architect could possibly have; it's individually matched to your building projects requirements. The expertise and passion of all Dennert employees guarantee fast and precise processes.

2015

2015 the DX ceiling is Germany's most successful prefabricated ceiling with over 18 million sold square meters

2010

2010 Dennert receives the TOP Innovation Award for the DX-THERM (ceiling cooling + heating)

2009

2009 the DX ceiling with extra long span of over 7 meters is introduced

1994

1994 for the first time, 1 million square meter are produced within a year

1987

1987 the patented DX lock is developed and successfully integrated into the DX ceiling

1979

1979 Dennert is the first supplier putting a prefabricated ceiling on the market

1978

1978 the first Dennert DX ceiling is developed and presented to public on April 5th





Time saver!

Time is money, this applies especially to working on construction site. With the DX ceiling system, working regardless of the weather conditions, is secured and above all, dry – the DX ceiling is installed within a few hours and will be immediately loadable. Shuttering? Supporting? Cast-in-place concrete? Or a even a separate construction crane? Not needed! – This is how you save a large amount of time and money!

Nowadays there is no need to still build ceilings that way: Time-consuming and with a large amount of water – leading to long drying times. No more complex supporting and shuttering. **Do you really want to impose this on yourself?**



Approximately 2,500 liters of water are used for 100 square meters of conventionally build ceilings



Convincing properties

Individually produced and assembled in record time

Only Dennert provides this innovative, patented and excellent DX ceiling system. The ceiling is produced according to your wishes with optimal conditions in the Dennert works.

Your construction site, as well as the access route, are inspected before delivering the ceiling, to avoid unpleasant surprises and delays. A specially trained installing expert coordinates the optimum workflow. The prefabricated ceiling will be directly craned off the truck by Dennert and installed in no time. The DX ceiling is fully loadable after installation, only the butt joints must be filled with a small amount of casting concrete.

Thanks to the prefabricated ceiling elements the progress or the construction time mainly doesn't depend on the weather conditions. The advantages of prefabricated ceiling are: less construction site waste, no shuttering costs and times, no props, and above all no humidity in your building, the DX ceiling arrives dry and on time at your construction site.



The DX ceiling unfolds its true strength on the construction site. At minute intervals, the DX ceiling panels are installed by the experienced assembly teams. After 2-3 hours, the ceiling of a typical detached house is installed without adding any water, tightened and fully loadable.



Top staircase integration

Right after production, the DX ceiling is already perfectly prepared for a staircase element, all you need to do is mount the element into the ceiling. Done! No matter the version of staircase element you decide on, it will always fit! You can continue the construction without any time delay, the staircase is fully loadable and passable, immediately after mounting.

Light on Resources

The pipes inside the DX ceiling don't only reduce the net weight and the amount of material needed, but they are perfectly suitable as electrical or installation ducts. This economical construction method is friendly to the environment and your wallet! The air in those pipes works as an additional thermal insulation.

Low mass and low material usage because of built in pipes



Low staff, space and material requirements on the construction site



Precise industrial prefabrication with top manufacturing tolerances



First-class service

- + Individual and personal
- + Technical and structural strength verification
- + In house planning department
- + Detailed installation blueprints
- + Inspection of the construction site

Professional logistics

- + Weather-independent production
- + On-time delivery
- + Installation directly of the truck
- + Specially trained installing expert
- + Everything from one single source

Fastest construction progress

- + Professional planning and engineering
- + Ceiling installation within a few hours
- + Immediately accessible
- + No shuttering, props, or separate crane
- + Installation regardless to any weather condition



Innovative ideas by Dennert.
The proven DX ceiling, developed
to modern standards.



The DX ceiling in Wooden Houses Take advantage of the massive benefits

Does wood bear solid concrete? Hard materials on soft materials? Dennert and many architects will answer you this question with a loud and clear: Yes! And it works very well, as experience has shown.

When examining the different product-specific properties of concrete and wood, the experts came to the understanding that an optimal house consists of a combination of these both materials. Satisfactory results in terms of sound insulation and vibration characteristics, are not easy to come by with wooden ceilings, they are only achieved with a very high effort and expenses.

By using a Dennert DX ceiling instead of a wooden ceiling, significant advantages in terms of fire protection (F90) vibration characteristics, sound insulation and higher span widths, can be achieved easily.

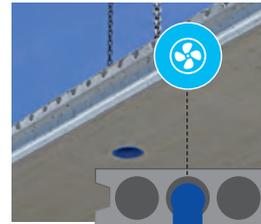
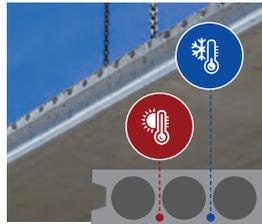


Concrete on wood. Commercial buildings with the solid prefabricated DX- PHERM ceiling. Implemented by the architecture firm Finkler. All you need to do is ask! – Dennert has always the right solution perfectly suited to your needs. Learn more on: beton-trifft-holz.de

Perfect climate with the DX ceiling

Efficient cooling, heating and ventilation

Comfortable living climate from the first day on. Relaxed construction, dry and healthy building materials. Depending on the chosen model, the excellent and solid prefabricated ceiling guarantees an optimal room temperature and a fresh air supply. Discover the numerous possibilities of the Dennert DX ceiling.



DX CEILING

DX-ceiling. The prefabricated concrete ceiling is delivered as a dry element just in time to the construction site ready for assembly and will be installed within approximately 2 hours

DX THERM

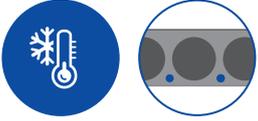
+ Cooling/heating. The vast pipeline system molded into the concrete upgrades the DX ceiling to a highly efficient heating and cooling system with numerous advantages

DX AIR

+ Ventilation. The preplanned and constructed diffusers in DX ceilings enable a simple and economic installation of additional ventilation pipelines

The possibilities to influence the room climate with DX-THERM ceilings are fantastic!





Pleasantly cool during the summer

The DX-THERM cools your room from the ceiling

The thermal energy within the uprising air is absorbed and drained by the cold water pipelines integrated in the DX ceiling. Over this thermal procedure you can achieve a reduction in room temperature up to 5 °C compared to the outdoor temperature.

Your advantages, not only during summer: Room temperature regulation without complex air conditioning systems, draught-free heat absorption over the entire ceiling surface, heating and cooling in one system, noise reduction, individual temperature control for each room, high efficiency, without any kind maintenance costs.

No expensive air conditioning units

18-20°

DX-THERM initial temperature

30°

Outdoor temperature

-5°

Temperature reduction

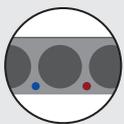
25°

Indoor air temperature

Running an air conditioning system is expensive and complicated. Nevertheless, since summer days with high temperatures are increasing in Germany, you would love to come home to a comfortable air-conditioned home.

Scientists found out that a temperature reduction of only 5 °C on hot days improves a humans performance as well as the over all wellness.

When operating with a reversible heat pump, the DX-THERM ceiling can be used as a cooling system.



The perfect feel-good climate

DX-THERM – the thermo active ceiling

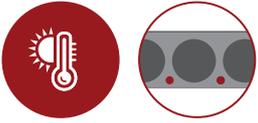
Thermal component activation means, that pipelines are installed within the solid concrete ceiling, which can be flooded either with cold or warm water according to demand. Due to the large transference surface, the temperature differences remain low. Comfortable and economical living climatet right from the start. Delivered dry and on time directly to the construction site and will be assembled within a few hours.

Reaction time of the DX-THERM compared to a floor heating system

DX-THERM – 66 min

Floor heating system/ cement screed – approx. 180 min





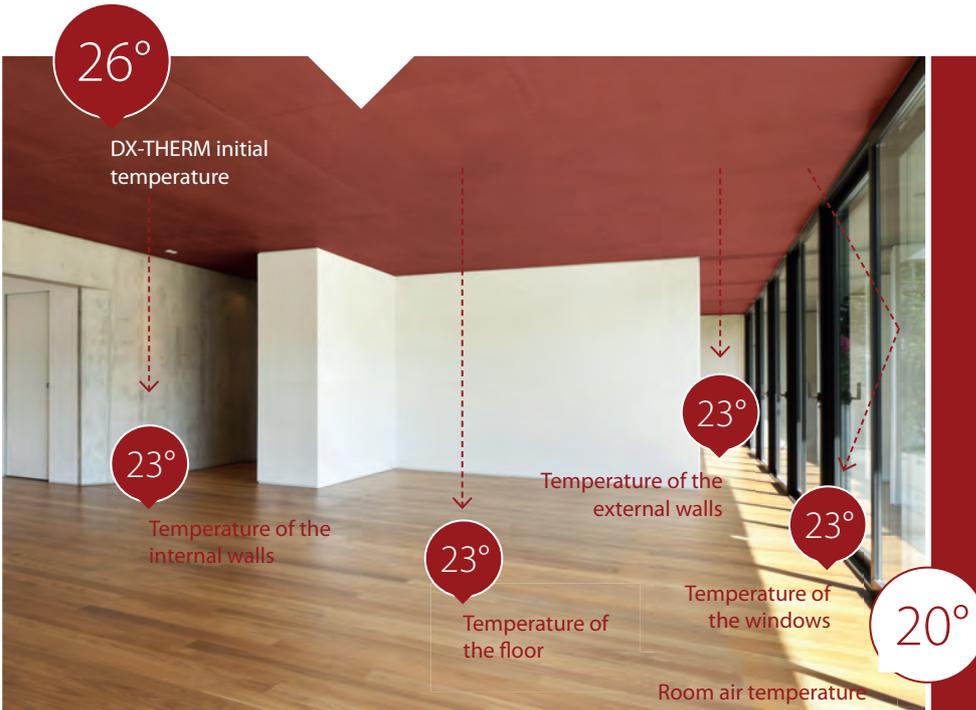
Pleasantly warm in the winter

The DX-THERM heats your room from the ceiling

The ceiling offers the largest net surface for heat distribution (low flow temperatures). The result is a healthy, comfortable and cozy heat distribution provided by the radiating heat.

Your advantages, not only during winter: Evenly spread and very comfortable radiating heat, less dust particles, a good level of humidity will be maintained in the house and won't dry out, absolute freedom in planning, very fast reaction time, lower installation costs, very economic.

No interfering radiators

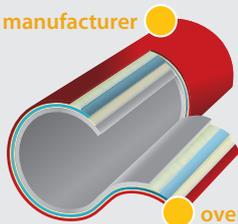


Heating a room with radiators is the still most common and well known method (convection). Disadvantage: the air of an entire room must be heated and is constantly moved around. This results in a draughty feeling and discomfort, the air circulation stirs up dust, pollen and microorganisms, such as mites.

The DX-THERM ceiling uses radiating heat. The air will only be slightly but evenly heated. Radiating heat will be effective, as soon as it reaches walls or objects. Radiating heat is just as pleasant as sun light on your skin!

Design of a multi-layer composite pipe – containing a aluminum core pipe

German manufacturer



overlapped welding

100% oxygen-tight



highest level of quality

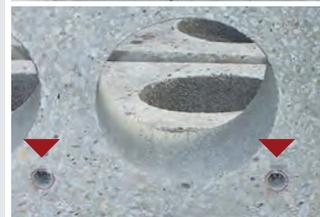
DX-THERM pipes molded into the lower concrete part, with a grid of 16,5 cm

Application field _____ panel heating / temperature control

Pipe _____ 16x2 mm 0 (t max: 60°C, p max: 6 bar)

Heating capacity _____ at 15 K temperature difference approx. 54 W/qm

Cooling capacity _____ at 8 K temperature difference approx. 51 W/qm



Aluminum composite pipes are molded into the ceiling, suiting for every room. Hot or cold water will flow through these pipes.

DX Services

- + Crane and transport
- + Specially trained installation expert
- + Pre-Inspection of the construction site
- + Calculation of the heating/cooling load Hydraulic adjustment



Dennert's clever DX world Well thought-out to the smallest detail

It is more than only a concrete element! With its wide range of complementary products and extraordinary service the DX ceiling system becomes a all in one package, which leaves nothing to be desired. You can choose between the Dennert on site service or closing the ceiling joints with the specially developed Sil-DX filler.



DX Complementary Range

- + Connection kit
- + Ventilation tool
- + Climatological profile



DX Finishing Kit

- + Glass fleece fabric
- + Adhesive
- + Sil-DX joint filler
- + Primer



The future is built today Responsible for people and nature

Energy-saving concepts, the responsible use of resources and taking care of the well-being of residents, are the requirements of modern construction. Energy consumption in particular will become one of the most important criteria for a building's value. Important decisions already have to be made when planning the shell of a building.

With this knowledge it is obvious to emphasize on healthy and sustainable materials. The solid DX ceiling is an energy-efficient and sustainable ceiling solution, that will influence the value of your home on the long run.



The raw materials used for the DX ceiling are largely natural and regional

14 strong arguments that speak for DX

All benefits at a glance

All of DX properties, in particular the geometry, ensure that buildings provide a healthy indoor climate, a low noise level, reliable fire protection and still enough freedom of designing your future home.

Experience the benefits of the DX ceiling system, for your own project. Meet all the static, fire protection and sound insulation requirements, without sacrificing any advantages that are provided by prefabrication, which are short construction periods and dry construction components.

1. Self supporting prefabricated balcony. Dennert provides a clever solution Self-supporting balcony solution; the special mounting-system for balconies fitting the DX ceiling guarantees a quick and safe installation of the balcony base to the ceiling panel. The integrated 'Shöck' ISO-basket efficiently prevents thermal bridges between balcony and the ceiling panel.

2. Thermal insulation. All factory-made cavities of the DX ceiling provide an improved thermal insulation. The heat transfer resistance of the 20 cm thick DX ceiling is almost twice as high as of a conventional reinforced concrete ceiling.

3. Economical, fast, top quality. The DX ceiling is more economical and cost effective than a conventional concrete ceiling: no shuttering, no supporting, no casting and no separate construction crane. There is no more time needed to wait until the concrete has hardened, the DX Ceiling is installed dry, you save the expenses for expensive dryers and drying energy. The Industrial production also ensures an unbeatable high quality standard and reduces the amount of work time on site. The ceiling will usually be installed within a few hours.

4. Force-locked ceiling connection. The Dennert locking system braces the ceiling panels together into a sustainable connection. In no time an extremely strong and force locked composite structure is formed. Caused shear forces are transferred from panel to panel.

5. Prepared for electric installation. The DX ceiling has factory-made cavities, these can be used as a cable ducts. On demand Dennert integrates electrical ducts and socket, e. g. for ceiling spots.

6. Manufacturing precision with a maximum freedom of planning. With the DX ceiling it's possible to plan individually and freely. All necessary ceiling break-troughs and recesses will be inserted into the concrete, exactly according to the blueprint, before the ceiling leaves the factory.

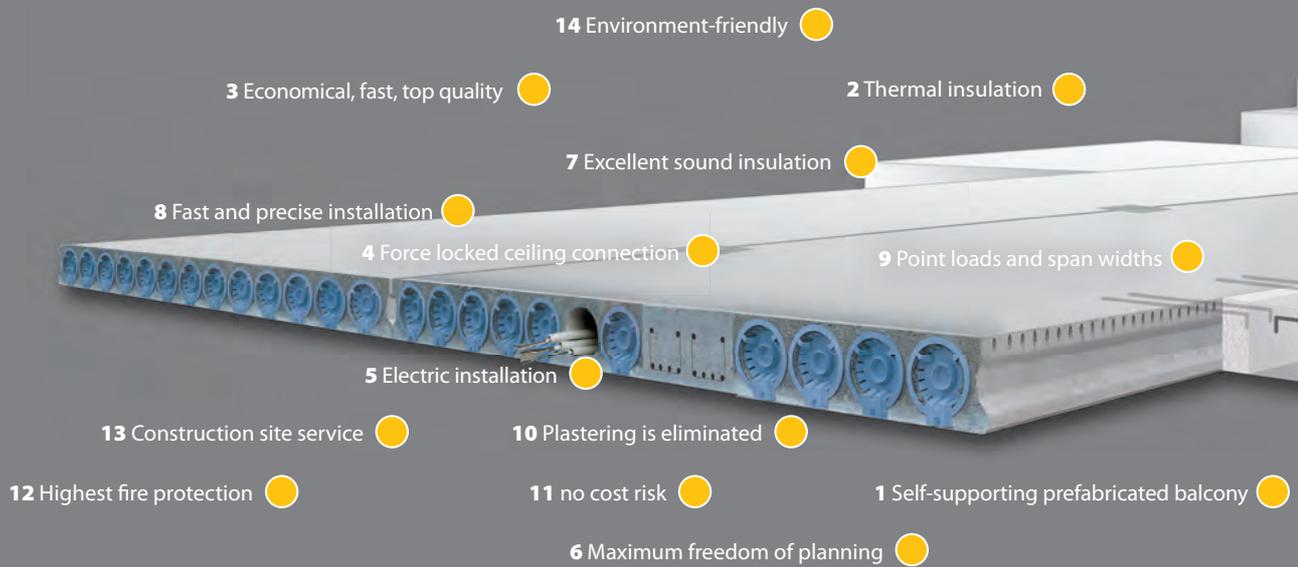
7. Excellent sound insulation. The DX ceiling convinces with the best insulation rates in the field of footfall sound absorption as well as airborne sound. The values measured by IBMB Testing Institute in Braunschweig are 10 percent above those of equivalent conventional solid ceilings.



DX-lock. The locking system braces ceiling panels together.



Best results in footfall sound absorption as well as airborne sound



8. Fast and precise installation. The experts of Dennert only need about two hours per story (approx. 100 m²) to install the DX. The ceiling is immediately loadable and the work on the shell of the house can be continued without interruption.

9. High stability with point loads and large span widths. For special static requirements the DX ceiling can be delivered reinforced for high point loads. The enforced covers for Window and door outboxes are integrated in the ceiling itself. Complex and time-consuming shuttering and filling are no longer necessary.

10. Plastering is no longer necessary. Save your time, avoid humidity and dirt on the construction site. The smooth underside of the DX ceiling can be wallpapered after filling the butt joints with the ready to use Dennert SIL-DX filler. The alternative to wallpaper: the specially designed DX painter fleece is placed right on the underside of the ceiling - the ceiling is paintable right after placing the fleece!

11. No cost risk. You receive a maximum of planning and financial security when purchasing the DX ceiling. With Dennert, you can be sure that your costs won't be higher than expected.

12. Top fire protection. Especially in public buildings fire protection plays a major role. Even in private homes it became a literal hot topic. Thanks to incombustible concrete, the DX ceiling withstands fire much longer (F90).

13. Special construction site service. Delivering on time is an obvious matter for Dennert. The truck-mounted crane and the Dennert staff arrive at the same time on the construction site and ensure a smooth installation. The construction site is inspected prior to delivery to make sure that all roads and paths are accessible.

14. Environment-friendly. All raw materials used for the DX ceiling are created by nature: cement made of limestone, sand, gravel and water. Dennert obtains all the raw materials from the immediate surrounding areas. To protect and maintain the nature, Dennert manufactures with modern, resource saving equipment. The weather-resistant surface of the DX is not in need of additional packaging, this way Dennert also contributes to preventing additional waste at the construction side.



XXL span width. A 20 cm thick DX ceiling can be spanned well over than 7 m.



13 Construction site service. You are looking for a competent partner? Call us: 09552 71500



Ceiling type	Dennert DX fully constructed ceiling		
Concrete and steel grade	C50/60, Bst 500S or prestressing steel, cast concrete C25/30		
Fire resistance class	R 30	R 60	R 90
Max. M_{Rd} (d=20)	130 kNm/m	130 kNm/m	150 kNm/m
Max. V_{Rd} (d=20)	35,9 kN/m <i>(ired 106,4 kN/m)</i>	35,9 kN/m <i>(ired 106,4 kN/m)</i>	35,7 kN/m <i>(ired 106,4 kN/m)</i>
Max. M_{Rd} (d=24)	160 kNm/m	160 kNm/m	190 kNm/m
Max. V_{Rd} (d=24)	43,6 kN/m <i>(ired 139,4 kN/m)</i>	43,6 kN/m <i>(ired 139,4 kN/m)</i>	43,5 kN/m <i>(ired 139,4 kN/m)</i>
Max. span width for $q = 2,70 \text{ kN/m}^2$ (d=20)	up to 6,75 m (> 6,75 m available upon request)		
Max. span width for $q = 2,30 \text{ kN/m}^2$ (d=20)	up to 7,00 m (> 7,00 m available upon request)		
Max. span width for $q = 2,70 \text{ kN/m}^2$ (d=24)	up to 5,75 m (> 5,75 m available upon request)		
Max. span width for $q = 2,30 \text{ kN/m}^2$ (d=24)	up to 6,50 m (> 6,50 m available upon request)		
Ceiling specific weight <i>(incl. joint filling)</i> (d=20)	3,25 kN/m ² (as a full panel = 5,0 kN/m ²)		
Ceiling specific weight <i>(incl. joint filling)</i> (d=24)	4,25 kN/m ² (as a full panel = 6,0 kN/m ²)		
Max. traffic load	up to 5,0 kN/m ² ($q > 5,0 \text{ kN/m}^2$, available upon request)		
Thermal conductivity λ_R (d=20)	1,25 W/mK		
Noise insulation rate R'_w (d=20)	58 dB* incl. floating screed, raw ceiling 53dB		
Standard impact sound level $L'n,w$ (d=20)	74 dB*		

* according to the opinion of the IBMB TU Braunschweig as of 14.04.1994 (The increase of impact sound level is possible on request)

Dimensions

Ceiling thickness	20 cm or 24 cm / 16 to 24 cm as a full panel
Element width	224,5 cm standard hollow panel (to 300cm as a full panel)
Panel grid	individual
Projection	h=20 cm: max. projection 2,15 m (ISO basket possible)
	h=24 cm: projection 2,50 m (ISO basket possible)

DX landing slab

Slab length	to max. 6,00 m freely selectable
Landing slab width	to max. 3,00 m freely selectable
Landing slab thickness	variable between 16 cm and 24 cm
Special design	after calculation

Comparing the E-Module

The E-Module (modulus of elasticity) of concrete is required to calculate the deformation of the components constructing with reinforced concrete. The higher the E-Module (N/mm²) the stiffer will be the concrete and the lower the deformation.

C 20/25	C25/30	C50/60 (DX ceiling)
30.000 N/mm ²	31.000 N/mm ²	37.000 N/mm ²
	+ 3,33 %	+ 23,33 %

Technical changes and errors reserved. We do not take over any liability typesetting and printing errors.



Dennert is always by your side.

For all questions revolving around DX ceiling, please directly contact the Dennert team:

Hotline: + 49 (0) 9552 71500 or **baustoffe@dennert.de**

Learn more: dennert-baustoffe.de

Expertise, authorizations, technical documents, etc. are available as PDF-files on the website available for download.

The DX checklist

Build with the correct Fully constructed ceiling system

- | | |
|-------------|-------------------------------------|
| Competitors | <input type="checkbox"/> |
| DX ceiling | <input checked="" type="checkbox"/> |
- Panel length up to and over 7 m** possible with a constant ceiling thickness of 20 cm?
 - Is the ceiling equipped with a **force-locked system**, which connects panel to panel?
 - Are **interlocking notches** molded into the panel edges to improve the joint shear strength?
 - Are **interior diameters up to 7 m** (more on request) possible without additional shuttering-, concrete-, steel- and salary-expenses, if the ceiling – common when building apartment homes - must carry a **payload of 270kg/m² or 230kg/m²**?
 - Is it possible to install electrical wires **through the ceiling** – , even after being manufactured?
 - Is the ceiling able **heat and cool** a room?
 - Will **special trained installation expert** be at the construction site?
 - Is the Ceiling a **dry pre constructed element**, manufactured **regardless of weather conditions**, in a factory with controlled processes and is delivered **JUST IN TIME to your construction site**?
 - Is there a **self-supporting balcony** available for the ceiling **during installation**?
 - Does the ceiling have a specially developed profile-system to strengthen window and door box outs?
 - Does the ceiling convince with several, **technically thought-out details**?
 - Is there a matching **finishing-kit**, made of joint filler and glass fleece?
 - Does the manufacturer offer **construction site service** such as site inspection as well as an extensive logistic package (incl. transport, crane, trained personnel)?
 - Is it possible to leave **out complex and disruptive bracing** during the installation of the Ceiling panels?



Please compare!



For those, who want more XCON – the modern construction-system

Making construction of homes and buildings easier, faster and safer has been Dennert's maxim for decades. With XCON Dennert offers a seamless, intertwining constructing-system and with it a solid building envelope from a single source.

The astonishing and high XCON productions standards can be experienced at the construction site. Month of construction, interruptions due to weather conditions or even coordinating difficulties among different craftsmen are reduced to a minimum.

All solid elements are dry since they are manufactured "in-house". The dangerous building moisture is reduced to a minimum and at the same time the construction time is incredibly short.



Top for everybody who wants to build a house, architects, and investors who want to build quickly, individually with a small amount of recourses





Construction system. With XCON Dennert delivers a solid, prefabricated, dry shell and thus sets new standards to construction. Dennert gives you the opportunity of a safe and exactly predictable construction – minimize your financial burden and say goodbye to construction-stress!

Package 1: Shell construction without insulation, windows, doors and roof

Package 2: Shell construction with insulation, plaster, windows, doors and roof



Prefabricated roof panels. Less work hours, more safety and better climate under the DC roof because of light concrete.

Only for the XCON construction system with insulation, windows and doors



Prefabricated Chimney. ATMOS, the chimney for aesthetes. Made of one cast with a smooth surface.



Prefabricated Walls. Solid, sustainable, fast and dry. The KX-WALL offers you a perfect room climate.

Also available without insulation, windows and doors



Staircase element. Numerous possibilities and many options - with STEP you have the choice.



Prefabricated ceiling, DX-THERM (heating + cooling). The patented and excellent DX ceiling guarantees a feel-good climate in every room.



Prefabricated Basement. The solid and dry BASE basement offers many options and different room heights.



XCON sums up all Dennert
Top quality materials



Only one of the many reasons that make DX ceiling so unique:

The patented locking system braces the DX panels together. In very short time an extremely stable and friction-locked ceiling composite is created.

