



**Primekss**

# PrīmX – Joint-free Concrete Technology

Consistent quality concrete technology anywhere in the world



Joint-less



Perfect for  
AGV



Low maintenance



Stays flat



Up to 70% less  
CO<sub>2</sub> emissions



Hygienic

## PrīmX – How We Got To It?



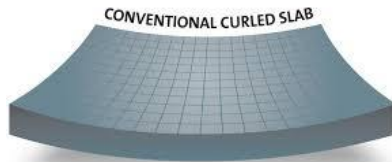
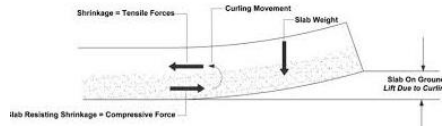
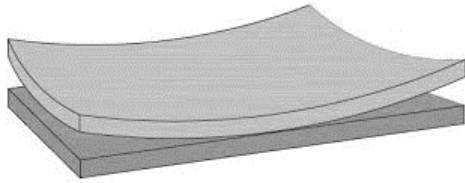
- Founded in 1997
- Specialist in floor coatings
- Initially everything went well

- After 6 months – complaints about quality
  - The concrete under our coating failed
- So, we started to search Why**

# Common Concrete Problems

## CONCRETE SHRINKAGE

### Curling



### Cracking



### Joints



**8%**

**of all man-made CO<sub>2</sub>  
emissions originate from  
cement production**



New composite materials are thin,  
light and durable



Why should concrete stay the same?



## Our Way to PrīmX

Primekss founded in 1997.  
SFRC adopted by Primekss

International team consisting of Primekss professionals and academics from various universities and research institutions took on the challenges of solving the main problem with concrete - **Shrinkage**

- PrimeQuality system developed
- PrīmX is patented
- PrīmX Technology receives many industry awards
- Started PrīmX systems global licensing

Ongoing research into perfecting PrīmX Technology

1997

2006

2009

2021

First version of PrīmX  
SFRSSC



PRIMX

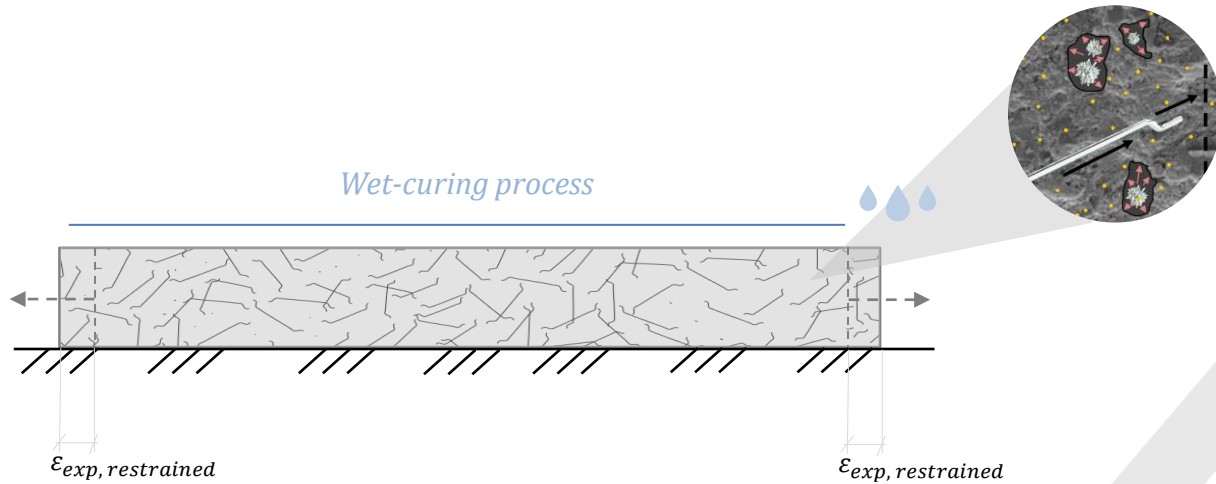


**NTNU**  
Norwegian University of  
Science and Technology



## PrīmX base properties

- 1 The shrinkage control
- 2 Steel fibre reinforced self-stressing concrete (SFRSSC)



- Chemically tensioned composite material
- Zero-Shrinkage
- Load capacity
- Dimensional stability
- Ect.

### Improved, efficient **materials**

- 3 types of admixtures in a patented system
- Steel fibers
- Adjusted mix design to project needs

### **Design – build approach**, own concrete R&D center

- Lab testing of cement, aggregates for reactivity and compatibility with the admixtures
- Advanced, customized mix-design preparation according project needs
- Design, engineering assistance



### Special **online quality system:** *PrimeQuality*

- End-to-end online quality system
- Monitoring of 21 parameter at jobsite
- Controlled by Primekss engineers

### Specialized **Equipment & training**

- Best in class equipment: laser screeds, fiber blowers, dumpers etc.
- Onsite concrete testing
- Trainings for partners

PrīmX = Design & Supply



# Contemporary Challenges

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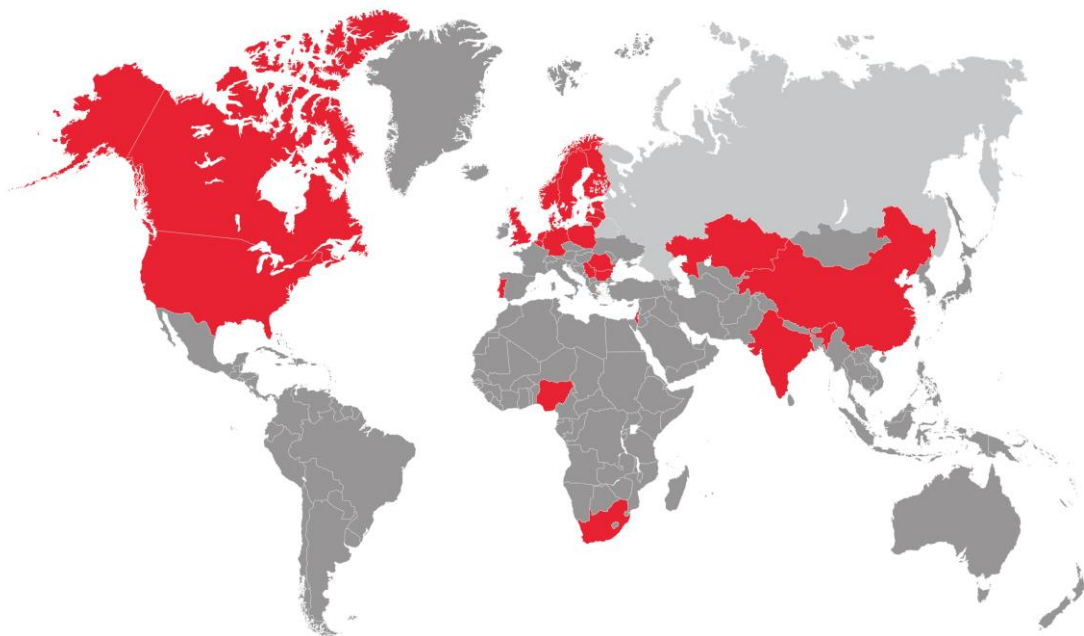
**VUCA**  
**Fast-Changing World**

**Robotics**  
**&**  
**Automation**

**CO<sub>2</sub> Emissions**  
**&**  
**Climate Change**

## Where We Stand Now

FOUNDED	1997
TURNOVER	>70 Mln. EUR
EMPLOYEES	<300
LICENSING PARTNERS	22
SATISFIED CUSTOMERS	1000 +

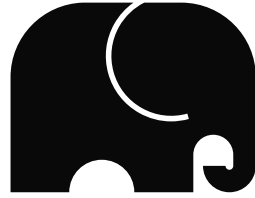


Already more than

**20 000 000 m<sup>2</sup>**

of indoor and outdoor slabs

Latvia • Lithuania • Estonia • Sweden • Norway • Denmark • Finland • Israel • Germany • UK • Netherlands  
• Poland • Belgium • Bulgaria • Serbia • Belarus • Russia • Kazakhstan • Azarbaijan • India • US • Canada  
• Portugal • Nigeria • South Africa • China • Romania

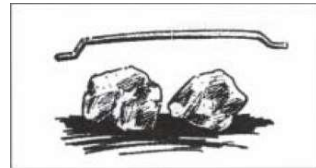


**Primekss**

# **PrimekssLabs Concrete Research and Development (R&D) Center**

## 1.

Daily **engineering activities** to ensure predictable quality in all stages of the project.



## 2.

**R&D questions** related to the rapid development of technology.



## PrimekssLabs Concrete R&D Center: facilities

Fully equipped laboratory facilities for **fresh** and **hardened** (fiber reinforced) concrete testing.



## PrimekssLabs Concrete R&D Center: staff

- **4 Concrete Quality Technical Managers (engineers)** with higher education from the universities in the Baltics and Scandinavia and many years of practical experience with **ready-mix concrete production** and **concrete quality assurance on site**;
- **1 Concrete Testing Technician.**



## PrimekssLabs Concrete R&D Center: technical support activities

- The daily technical support activities include:
  - Concrete **mix design** development for all PrīmX projects globally;
  - **Concrete part material** testing (cement, aggregate, SCMs etc.);
  - **Concreting technology** consulting;
  - Concreting **QA plan** development;
  - **Casting follow-up** on site;
  - **Fresh concrete** testing on site;
  - Determination of **hardened** (fiber reinforced) **concrete mechanical properties**;
  - Determination of the mechanical and optical properties of the **concrete surface**;
  - Monitoring of actual **temperature development, strain** and **RH** in-situ.
  - **Troubleshooting** and **problem solving**.

## (Fiber reinforced) concrete mechanical properties:

- **Post-cracking tensile strength** acc. to *SIA 162/6*;
- **Flexural toughness** of fiber reinforced concrete acc. to *ASTM C1550-12a*;
- **Flexural strength** acc. to *EN 12390-5*;
- **Flexural tensile strength** of fibre reinforced concrete acc. to *EN 14651*;
- **Flexural tensile strength** of fibre reinforced concrete acc. to *DAfStb-Richtlinie Stahlfaserbeton Ausgabe*;





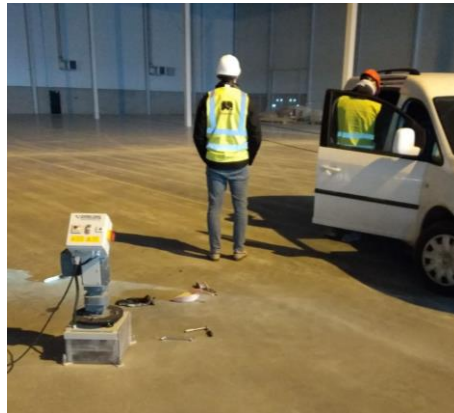
## (Fiber reinforced) concrete mechanical properties:

- **Compressive strength** acc. to *EN 12390-3*;
- **Steel fiber characteristics** acc. to *EN 14889-1*;
- **Restrained Expansion** of Shrinkage-Compensating Concrete according to *ASTM C878/C878M*;
- **Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete (free expansion and shrinkage)** acc. to *ASTM C157/ C157M*;

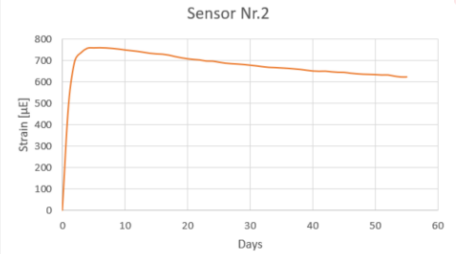
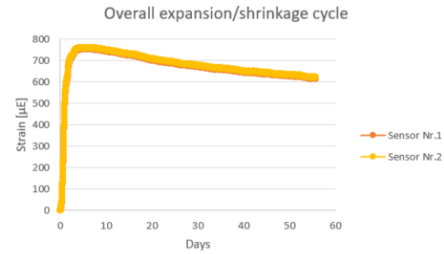
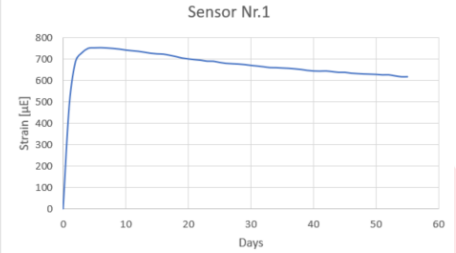
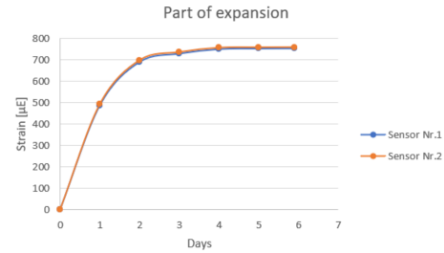
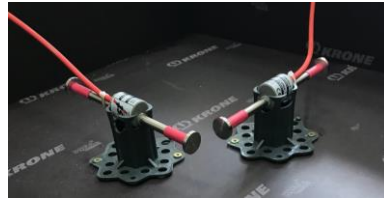
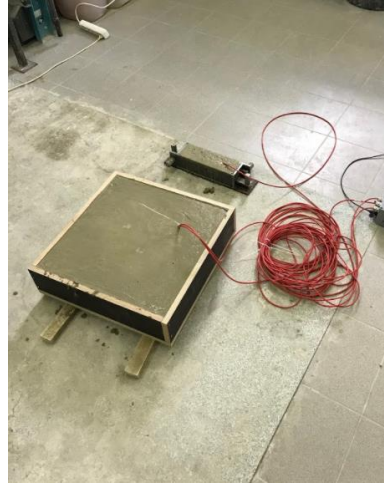


## Determination of the mechanical and optical properties of the concrete surface

- > Determination of **Wear Resistance** - BCA acc. to *EN 13892-4*;
- > **Surface Gloss** at 20°/60°/85°;
- > **Surface Friction** acc. to *ANSI A326.3*;
- > **Surface Roughness** by measuring the Roughness Average (Ra) per *ISO 4287*.



# Determination of the in-situ strain development of the PrīmX slab structures



## Patents and membership in Associations/Organizations

- **PrīmX** - patented High performance Zero shrinkage steel fiber reinforced concrete system to ensure consistent, high quality concrete floors anywhere in the world.
- patented in 2009
- **PrīmX UltraPack** is a patented high performance two-layer composite concrete pavement system for outdoor application that has been specially engineered to be able to withstand the hygral, thermal and structural loads imposed on an exterior pavement, thus allowing to build structures without need for control joints.

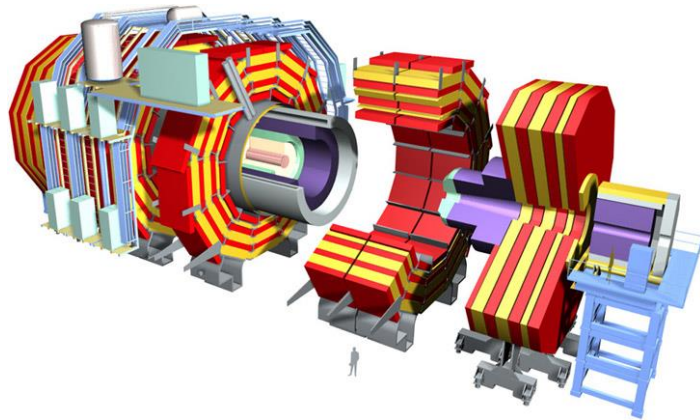
## PrimekssLabs Concrete R&D Center: R&D projects



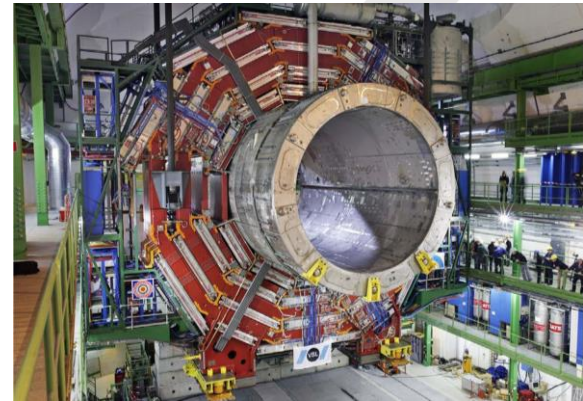
- The concrete R&D center is also actively involved in the relevant research projects within the Primekss group. Currently one of the most high level projects is a collaboration projects with **CERN** = *European Organization for Nuclear Research*, one of the world's largest and most respected centres for scientific research.
- Primekss & CERN Joint Studies of ***PrīmX* Concrete in View of Radiation Protection Aspects**.
- At the moment there are actual 2 sub-projects in progress or completed.

## #1

Technical assessment of the condition and causes of vertical deformations of the concrete floor slab at the CMS experiment (**detector at the large hadron collider**).

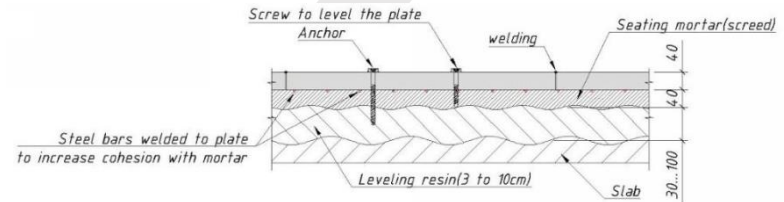
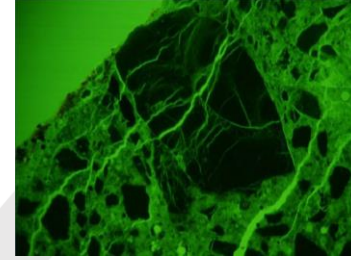
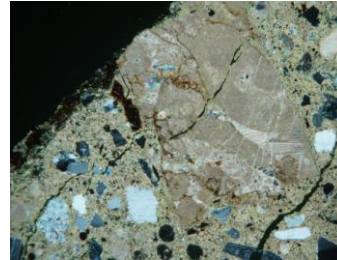
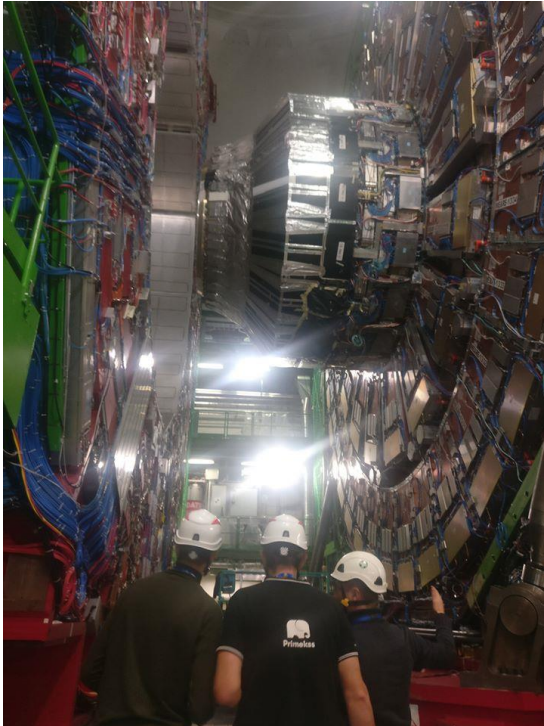


14 000 metric tons



Figs: CERN

# PrimekssLabs Concrete R&D Center: CERN





## #2

Joint studies of the ***PrīmX* Specialist Concrete in view of Radiation Protection Aspects.**

CERN is interested in Primekss unique high-performance Zero shrinkage jointless concrete technology – ***PrīmX*** because it allows to build efficient watertight and gas-proofing solutions. For **CERN** such technology is actual because it's important to prevent efficiently any leakage of radioactive waste from building structures where experiments are held. **Radioactive waste products** in this case can be both – in form of gas (particularly – Tritium gas) as well as in liquid form.

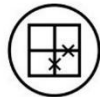




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