

VUC Informationsdag Älvkarleby 2023

Dramix® stålfiberarmering för mer hållbara betongkonstruktioner

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Dramix® stålfiberarmering för mer hållbara betongkonstruktioner

Introduktion till Bekaert

Våra fiberserier Dramix® 3D, 4D & 5D

Praktiska exempel

Vägar till hållbara betonglösningar



It all started
in **1880...**

Leo Leander Bekaert,
founder of Bekaert.

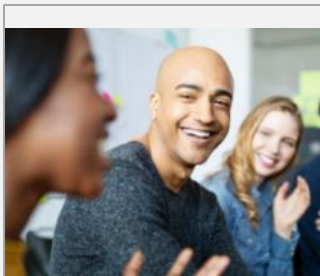
- Globalt företag med bas i Belgien.
- Börsnoterat på Euronext Brussels.
- Omsättning ca. SEK 60 miljarder.
- Antal anställda ca. 27000 st.
- Kärnkompetens inom tråddrageri, ytbeläggning , innovativa material och tillhörande tjänster.
- Omfattande produktprogram

www.bekaert.com

Our ambition is to create sustainable value for all our stakeholders
for our customers, employees, shareholders and communities



We make our
customers
succeed



We are
truly
better together



We commit
to high
performance



We care
for the world
around us

WE PERFORM

WE TRANSFORM

WE GROW

Sustainable value creation for all stakeholders

Strategic
imperatives

Våra stålfiberserier Dramix® 3D, 4D & 5D

3D[®]
Dramix



4D[®]
Dramix



5D[®]
Dramix

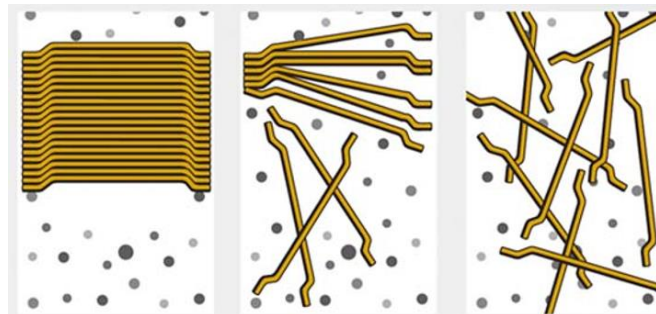
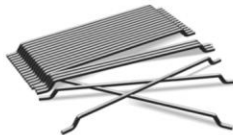


- Dramix[®] är ett varumärke
- 3D, 4D & 5D är olika stålfiberserier
- Olika Dramix[®] för olika betongsammansättningar & användningsområden

Dramix[®]

**Fiberarmering
av ståltråd**

- Förankring till betong genom vidhäftning och ändkrokar.





DATASHEET

Characteristics

Material properties
Nom. tensile strength: 1.345 (N/mm²)
Young's modulus: 200.000 (N/mm²)
Strain at ultimate strength: 0,6 %

Geometry
Fibre family: **3D**

Length (l) 35 mm

Diameter (Ø) 0,55 mm

Aspect ratio (R) 65

Minimum EN 14889-1 dosage 15 kg/m³

Fibre network 8.032 m/m³ at 15 kg/m³
14.711 fibres/kg

Dramix® family
3D Typical SFRC applications
4D Supreme serviceability control
5D Advanced structural applications



Product certificates*



*Product certificates are plant specific.

Product conformity

Dramix® conforms to ASTM A602, EN 14889-1 and ISO 15070 Class A.

System certificates



Packaging



Handling



DRAMIX® 3D 65/35BG

The original anchorage. Dramix® 3D is the coefficient fibre for standard stability in heterogeneous concrete structures that are subjected to regular static, fatigue and dynamic loadings.

Glue technology for three-dimensional reinforcement
Dramix® steel fibres are bonded with water-soluble glue. The glue helps avoiding fibre coating during mixing and ensures a homogeneous distribution of fibres throughout the concrete mix.

Bekaert construction support
You can count on our support for each step of your project, from concept design to on-site quality support. Our services include recommendations on site design, construction detailing, concrete optimisation and automatic total quality control procedures. We are also happy to share our knowledge with you and your team.

Feel free to ask us for a workshop or training on the topic of steel fibre reinforcement in your offices.

For recommendations on handling, dosing and mixing visit www.bekaert.com/dosing/dramix. Any other specific document or certificate can be found on www.bekaert.com/dramix/downloads.

Beakert reserves the right to modify, discontinue or relocate this product at any time with or without notice. All information contained herein is general and may not be applicable. For further details, please contact the Bekaert office.



DATASHEET

Characteristics

Material properties
Nom. tensile strength: 1.850 (N/mm²)
Young's modulus: 200.000 (N/mm²)
Strain at ultimate strength: 0,6 %

Geometry
Fibre family: **4D**

Length (l) 35 mm

Diameter (Ø) 0,55 mm

Aspect ratio (R) 65

Minimum EN 14889-1 dosage 15 kg/m³

Fibre network 8.032 m/m³ at 15 kg/m³
14.222 fibres/kg

Dramix® family
3D Typical SFRC applications
4D Supreme serviceability control
5D Advanced structural applications



Product certificates*



*Product certificates are plant specific.

Product conformity

Dramix® conforms to ASTM A602, EN 14889-1 and ISO 15070 Class A.

System certificates



Packaging



Handling



DRAMIX® 4D 65/35BG

Optimised anchorage. Dramix® 4D provides optimal crack control for standard slabs. Heterogeneous concrete structures that are subjected to regular static, fatigue and dynamic loadings with high serviceability requirements.

Glue technology for three-dimensional reinforcement
Dramix® steel fibres are bonded with water-soluble glue. The glue helps avoiding fibre coating during mixing and ensures a homogeneous distribution of fibres throughout the concrete mix.

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DATASHEET

Characteristics

Material properties
Nom. tensile strength: 2.300 (N/mm²)
Young's modulus: 200.000 (N/mm²)
Strain at ultimate strength: 6,0 %

Geometry
Fibre family: **5D**

Length (l) 60 mm

Diameter (Ø) 0,9 mm

Aspect ratio (R) 65

Minimum EN 14889-1 dosage 15 kg/m³

Fibre network 2.999 m/m³ at 15 kg/m³
3.124 fibres/kg

Dramix® family
3D Typical SFRC applications
4D Supreme serviceability control
5D Advanced structural applications



Product certificates*



*Product certificates are plant specific.

Product conformity

Dramix® conforms to ASTM A602, EN 14889-1 and ISO 15070 Class A.

System certificates



Packaging



Handling



DRAMIX® 5D 65/60BG

Ultimate anchorage. Dramix® 5D remains firmly anchored inside the concrete. Similar to rebar, the wire shows adequate bending or tensile stresses. This fibre is the perfect solution for structural applications.

Glue technology for three-dimensional reinforcement
Dramix® steel fibres are bonded with water-soluble glue. The glue helps avoiding fibre coating during mixing and ensures a homogeneous distribution of fibres throughout the concrete mix.

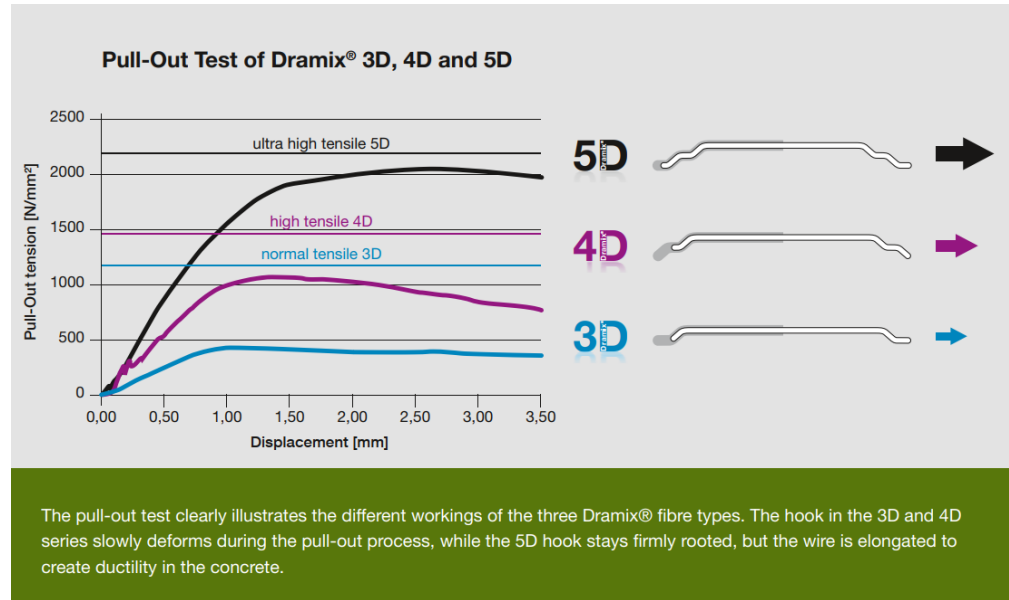
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Ovan visas ett exempel ur varje produktserie 3D, 4D & 5D



Varför så många olika Dramix® stålfiberserier och fibertyper?

Olika funktion på Dramix® för olika användningsområden samt betongsammansättningar.

Dramix® 3D stålfibrer har funnits >40 år. 4D & 5D är produktutveckling.

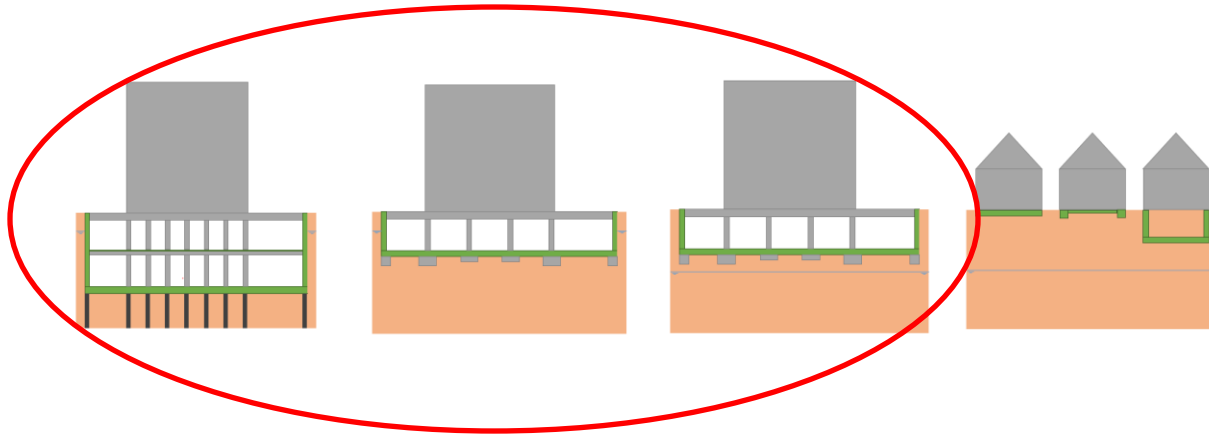
- Kan helt eller delvis ersätta konventionell armering.
- Dramix® Stålfibrer har olika förankringsutföranden, längder samt tjocklekar. Dramix® finns i olika stålkvaliteter med unika specifika egenskaper. De varierar mellan olika fiberserier och fibertyper.
- Dramix® finns i obehandlat, galvaniserat och rostfritt utförande. Ofta limmade i flak för underlättad iblandning eller som lösa individuella fibrer.
- Dramix® Stålfibrers egenskaper varierar således beroende på fibertyp vilket givetvis även påverkar den färdiga stålfiberbetongens prestanda och egenskaper.

Praktiska exempel

Vad kan vi göra redan idag för att minska
CO2 avtrycket ?

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Kombinationsarmering i källare med krav på vattentätet ger avsevärt bättre värden vad gäller CO2 avtryck.





Grotius - The Hague (NL)

- Huvudentreprenör: J.P. Van Eesteren & Besix
- Arkitekt: MVRDV
- Konstruktör: IMd Raadgevende Ingenieurs



-30% CO2

Grotius - The Hague (NL)

	Traditionell	Hybrid
tjocklek	400mm	400mm
betong	C30/37	C30/37
ö.k. armering	Ø16-100	Ø12-100
u.k. armering	Ø16-100	Ø12-100
stål fiber	No fibers	25 kg/m ³ 4D 65/60BG
Material cost	77 €/m ²	61 €/m ²

Sprickviddskrav = 0,15mm

Total besparing = 41.250€

Nasjonalmuseet – Oslo (NO)



- Grundplatta
- 9m vattentryck
- Entreprenör: AF Gruppen

	Traditionell	Hybrid
Tjocklek	750mm	750mm
Betong	C30/37	C30/37
Ök. armering	Ø32-120	Ø25-100
Uk. armering	Ø32-120	Ø25-100
Stål fiber	No fibers	30 kg/m ³ 4D 65/60BG

Vad kan vi göra redan idag för att minska CO2 avtrycket ?

- Kombinationsarmering i källare med krav vattentäthet ger avsevärt bättre värden vad gäller CO2 avtryck.
- Göra tunnare konstruktioner och minska åtgången av betong i sådana fall där idag täckskikten styr minsta tjockleken.

Sockelement / Sandwichväggar



70-80 mm tjocka skikt kan ofta reduceras till 40-50 mm

Vägar till mer hållbara betongkonstruktioner

Vägar till mer hållbara armerings-/ konstruktionslösningar

- **Kontakta oss på Bekaert!**
- **Använd mindre mängd armering!**
- **Nytänkande smart armering!**
- **Optimera betongmängden!**
- **Nya hållbara betongsammansättningar!**

Frågor?

Tack för oss!





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