

# The lightweight revolution

From static to dynamic applications and what comes next?

 Dyneema®  
With you when it matters



 DSM



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 **Dyneema®**  
With you when it matters



# ***Content***

- **High modulus synthetic fibers**
- **Existing application fields**
- **New dynamic application fields**
- **Future outlook**



# ***High Modulus Synthetic Fibers***

# What is Dyneema®?



## What is Dyneema®

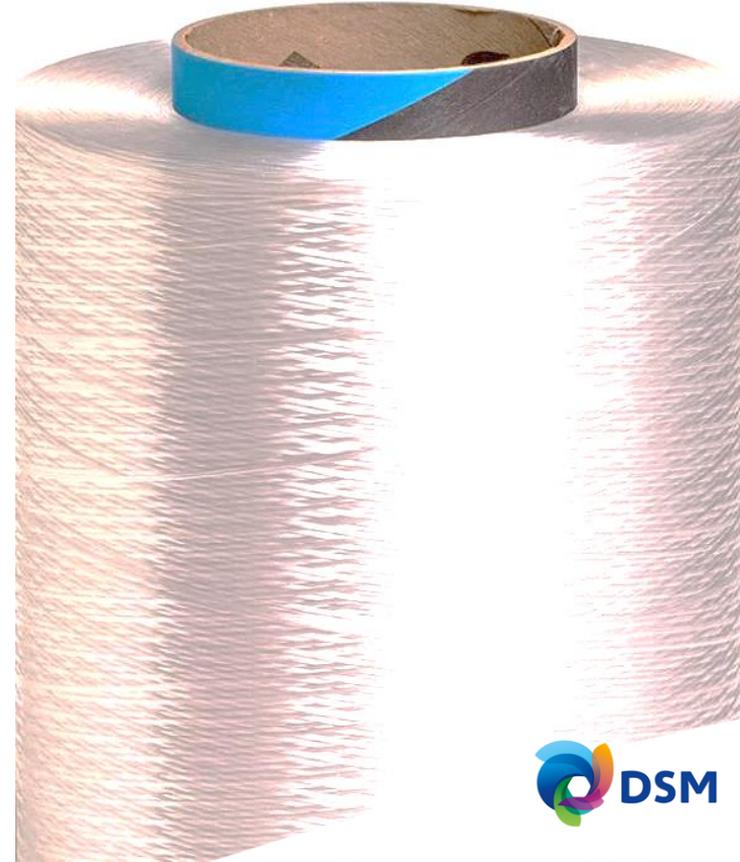
Dyneema® is the premium ingredient brand for ultra-high-molecular-weight polyethylene fiber, unidirectional (UD) sheet and fabric invented and manufactured by DSM

## Dyneema® provides:

- Light weight with incredible strength
- Abrasion resistance
- Incredible durability
- Low creep
- Cut resistance
- High resistance against deformation (modulus)

## So it can:

- Stop bullets
- Secure LNG Carriers
- Create the world's safest hands



# What is Dyneema®?

Dyneema® is a Polyethylen yarn with:

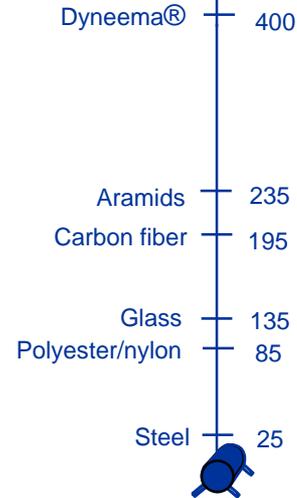
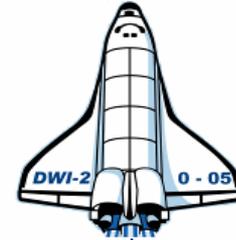
- Ultrahigh Molecular weight
- Very high degree of orientation



Normal Polyethylene

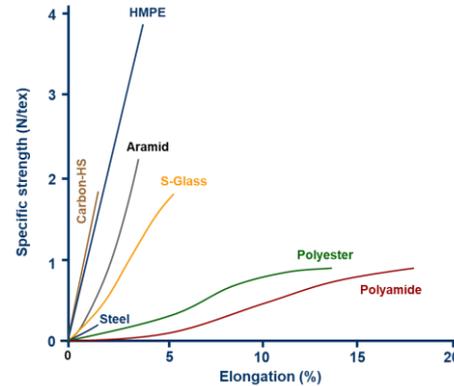


Dyneema®

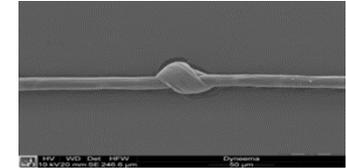


Free Breaking  
length (km)

# Strength by weight



Aliphatic  
(Flexible)



Aromatic  
(Rigid)



Fiber / Wire	Density	Strength		E-modulus		Elongation
	g/cm3	N/tex	GPa	N/tex	GPa	%
HMPE (Dyneema®)	0,97	3,5	3,4	110	107	3,8
P-Aramid (Kevlar®)	1,44	2,5	3,6	41	60	3,6
Co-polyamide (Technora®)	1,39	2,5	3,5	52	72	4,6
LCP (Vectran®)	1,4	2,5	3,2	52	75	3,8
Steelwire	7,9	0,2	1,8	25	200	2-5

# ***Existing application fields***

# Heavy lifting

## Markets:

- Lifting, Crane wire & Utilities

## Proven solutions:

- Slings
- Protective sleeves/covers
- Webbing

## End user benefits:

- Less injuries
- Less maintenance, longer service life
- Larger pay load, Better load control
- Larger operational speed
- Less employees required
- Higher productivity



 **Dyneema®**  
With you when it matters

 **DSM**

# Heavy lifting

## Example:

ALE Heavy Lifting using lightweight lifting slings during construction of FPSO; positioning modules weighing up to 3,000 tons

## Example:

Unitex round slings tripled productivity at TATA Steel compared to previously used steel slings



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# Synthetic chains

## Markets:

- Lifting
- Lashing

## Proven solutions:

- Lifting synthetic chain
- Lashing synthetic chain
- Protective covers

## Value proposition:

Webbings made from Dyneema® fortify the chains for rough use conditions with high abrasion and cut resistance, low wear & tear, and excellent anti-fatigue performance



## Property synt. chain vs steel chain - End-user benefits

### 8x less weight

- Easy handling
- Improved productivity
- Better ergonomics

### 70x less noise

- Better working conditions
- Less noise for personnel & environment

### Soft touch

- Safer in use/less injuries
- No damage to cargo

### No corrosion

- Less maintenance
- Long lifetime



# Heavy lifting

## Example:

...on the ocean, for Scottish Beatrice windfarm, monopiles supplied by SHL were installed within time and budget...

## Example:

.....WSA Heidelberg (Germany) manages a 200-kilometer partition of river Neckar. Using synthetic link chains for lifting valuable equipment...



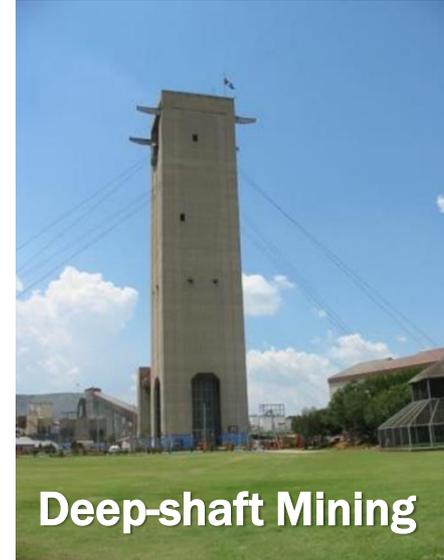
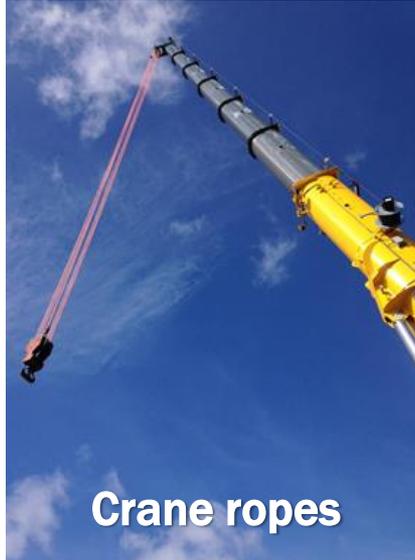
DoNova® PowerLift with Dyneema® at WSA Heidelberg



# ***New application fields***

# Synthetics in dynamic applications

High Performance Ropes in running rigging applications



Pay Load increase with Dyneema® vs Steel in %

200

400

1.000

# Crane rope

## Markets:

- Lifting
  - Onshore
  - Offshore

## Solutions offered:

- Tower cranes

## Value proposition:

- Faster reeving
- Increased Lifting capacity (20%)
- Increased lifetime (X4)
- Chemical resistant
  - No rust
  - No relubing
- Torque free
- Lower Block weight
- Lower total cost of ownership
  - Reduced operational costs
  - Increased productivity
  - Increased durability
  - Increased safety



# ***Future outlook***

Believe the impossible....





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**Work smarter.  
Choose Dyneema®.**



# Join the conversation



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company/Dyneema



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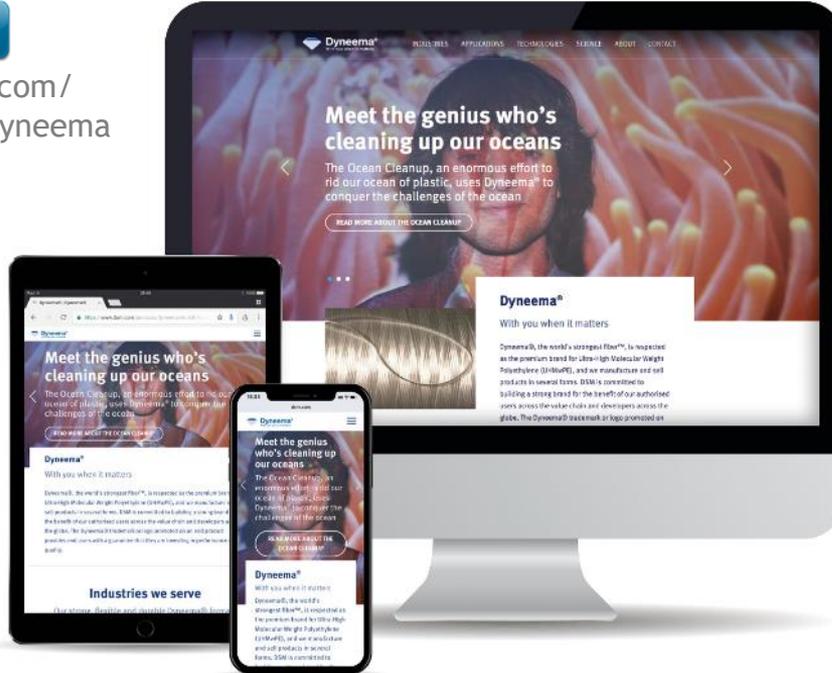
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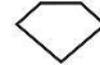
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