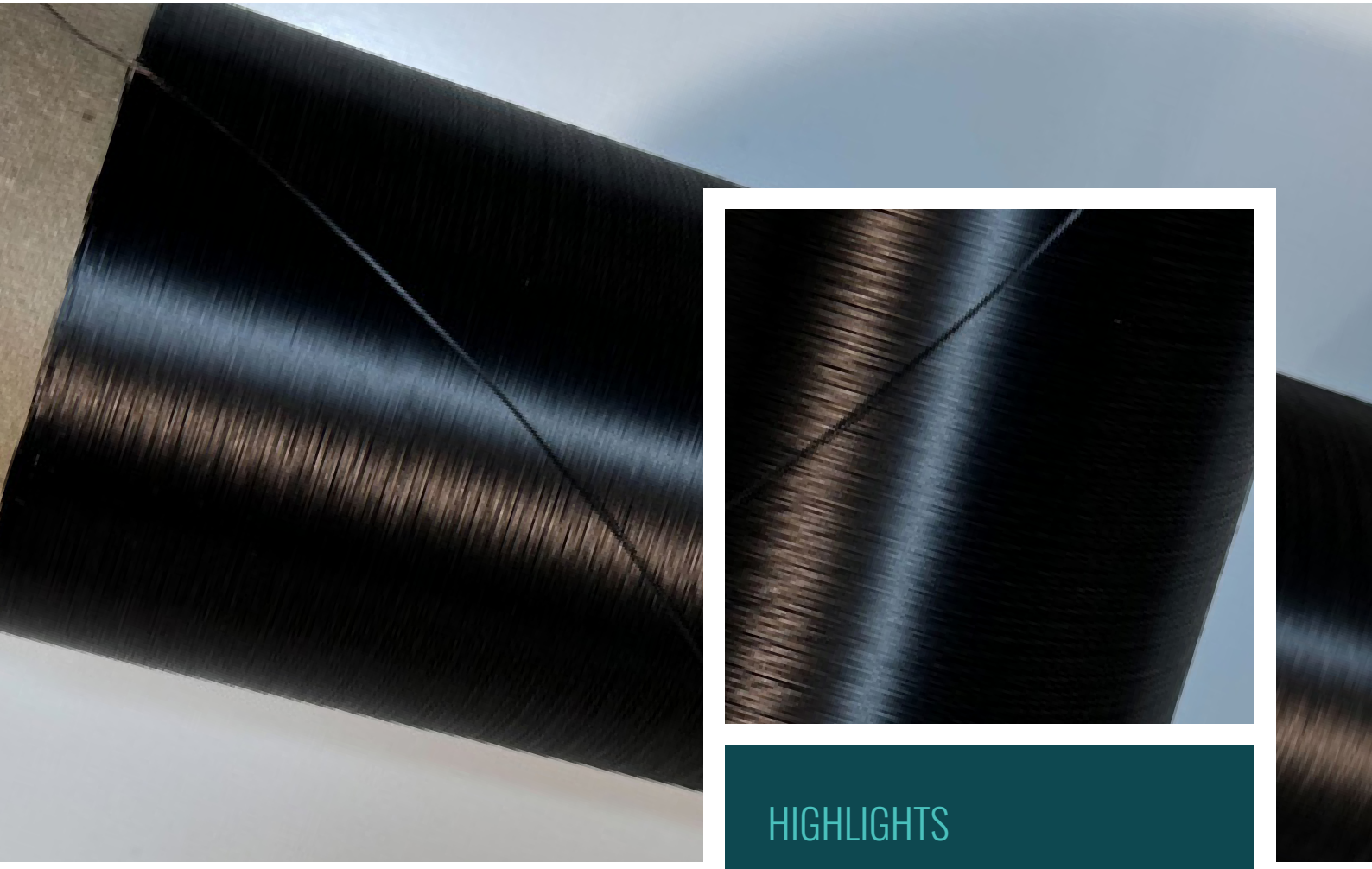
GALVORN

SPECIFICATIONS SHEET



GALVORN OVERVIEW

Galvorn has the conductivity of metals, while offering significant weight savings and orders of magnitude more strength and flexibility.

Galvorn was originally invented by Nobel laureates for high performance space applications, and DexMat has exponentially increased production capacity since its founding to make Galvorn accessible to critical applications on Earth.

HIGHLIGHTS

80% LESS DENSE THAN COPPER

50X STRONGER THAN COPPER

100X MORE FLEXIBLE THAN COPPER

DEXMAT

GALVORN PROPERTIES

CONDUCTIVE

Nearly equivalent to copper
The electrical conductivity of Galvorn is nearly equivalent to copper on a per mass basis.

LIGHTER

80% less dense than copper
Galvorn's density is 1.6 g/cm3. Copper's density is 9.0 g/cm3. Aluminum's density is 2.7 g/cm3.

STRONGER

50x stronger than copper
Weight for weight, Galvorn is 50x stronger than copper. (And 15x stronger than steel.)

MORE FLEXIBLE

100x flex life of copper (and carbon fiber)
Galvorn's exceptional flex tolerance promises superior durability in the end-use application.

MORE THERMALLY CONDUCTIVE

17% more than copper
Galvorn has higher thermal conductivity than copper: 450 W/m-K versus copper at 385 W/m-K. This makes it better at dissipating heat.

CORROSION-RESISTANT

No rusting, no pitting, even over years
The carbon-carbon bonds in Galvorn resist oxidation and chemical reactions under standard conditions, making it inherently stable.

STATE OF THE ART MATERIAL COMPARISONS*

Properties	**Galvorn**	Copper	Aluminum	Steel	Carbon Fiber	Aramids (Kevlar)	Dyneema
Strength, GPa	3	0.38	0.41	1	6.4	3	3.9
Density, g/cm^3	1.6	9.0	2.7	8	2.1	1.4	0.98
Conductivity, MS/m	10	58	33	3.4	0.1	Insulating	Insulating
Thermal Conductivity, W/m-K	450	385	237	50	200 - 1000	0.04	20
Specific Conductivity (Sm^2/kg)	6150	6300	12200	400	50	-	-
Young's Modulus, GPa	200	100	68	200	200 - 400	130	132
Tenacity (N/tex)	2.00	0.04	0.15	0.13	3	2.1	3.9

*Properties are based on tests performed on single filament fiber or solid metal wire.

DEXMAT

GALVORN HS PROPERTIES

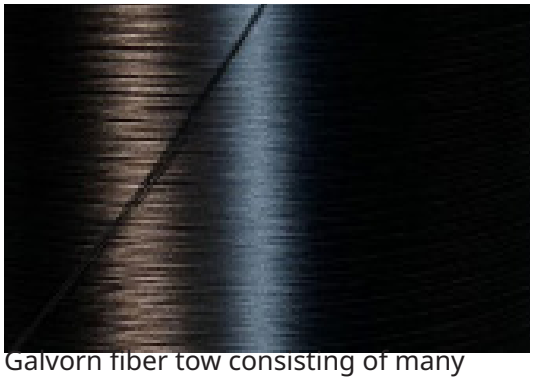
Galvorn HS ("High Strength") is a grade of Galvorn that is optimized for high strength applications, while also maintaining its conductivity and other high-performance properties.

Galvorn **Single Filament Fiber**	
Linear Density, tex	0.6
Conductivity, MS/m	10
Resistance, Ω/m	200
Density, g/cm^3	1.6
Tensile Strength, GPa	3
Tenacity (N/tex)	2
Thermal Conductivity, W/m-K	450
Young's Modulus, GPa	200
Diameter, µm	30
Available lengths, m	1 - 10,000

SINGLE FILAMENT FIBER

Galvorn single filament fiber exhibit the highest grade of properties.

Galvorn **Fiber Tow**	
Linear Density, tex	5 - 200
Conductivity, MS/m*	5 - 7
Resistance, Ω/m	1 - 40
Density, g/cm^3*	1.3
Tensile Strength, GPa	1 -2
Tenacity (N/tex)*	0.8 - 1.5
Thermal Conductivity, W/m-K*	200 - 300
Young's Modulus, GPa	40 - 150
Diameter, µm*	15 - 30
Available lengths, m	1 - 10,000
Available number of filaments per tow	5 - 200



Galvorn fiber tow consisting of many individual fiber filaments.

FIBER TOW

* Properties for individual filaments in the

Note: Listed Galvorn properties were measured at 21 ±
and 50 ± 10% relative hum

DEXMAT

GALVORN HS PROPERTIES

Galvorn **Yarn**	
Linear Density, tex	17 - 175
Conductivity, MS/m	3 - 5.5
Resistance, Ω/m	1.2 - 10
Density, g/cm^3	0.7 - 1.2
Tensile Strength, GPa	0.5 - 1.6
Tenacity (N/tex)	1.1 - 1.5
Thermal Conductivity, W/m-K	200 - 300
Young's Modulus, GPa	50 - 95
Diameter, µm	150 - 5000
Available lengths, m	1 - 10,000

YARN

Galvorn fibers are twisted or braided into yarn to hold fibers together and increase diameter.

Galvorn **Fabric**	
Fabric thickness, mm	0.1 - 0.6
Fabric weight, g/m^2	10 - 500
Sheet Resistance, Ω/sq	0.01 - 1.0
Available dimensions, m	Up to 0.4 m in length / width

Note: Listed Galvorn properties were measured at 21 ± 2°C and 50 ± 10% relative humidity.

FABRIC

Galvorn yarns or fibers assembled into textile fabrics.

GALVORN HS PROPERTIES

Galvorn **Film**	
Linear Density, tex	0.27 - 900
Conductivity, MS/m	3 - 5
Resistance, Ω/m	0.3 - 1
Density, g/cm^3	1.5
Tensile Strength, GPa	0.7
Thermal Conductivity, W/m-K*	150
Width, cm	1 - 6
Thickness, µm	10 - 20
Available lengths, m	1 - 100

*Longitudinal

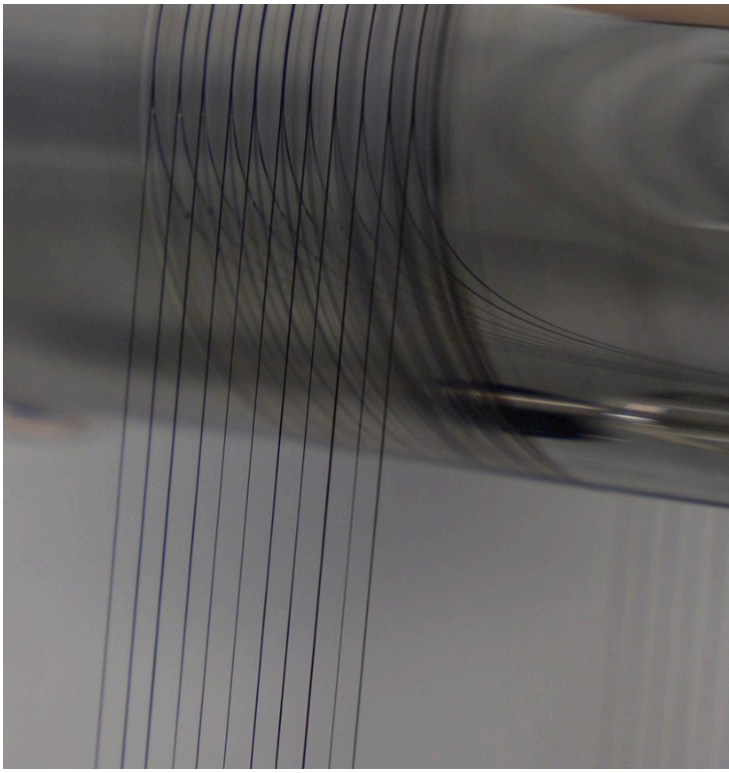
Note: Listed Galvorn properties were measured at 21 ± 2°C and 50 ± 10% relative humidity.

FILM

Flexible and conductive thin film made of Galvorn.

ADDITIONAL RESOURCES

VISIT:
dexmat.com/blog
dexmat.com/resource-center

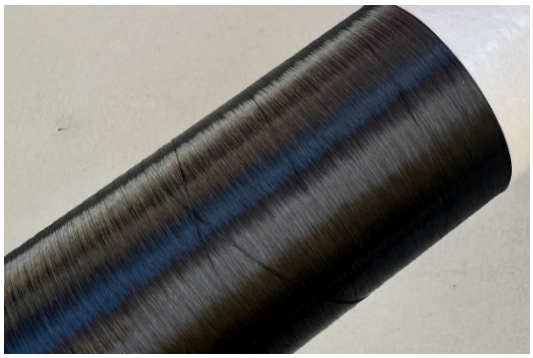


DEXMAT

GALVORN C PROPERTIES

Galvorn C ("Conductivity") is a grade of Galvorn that we have optimized for conductivity and compatibility with standard textile manufacturing equipment. Consider this new conductive yarn if you are in need of a lightweight conductor but do not want the full strength of traditional Galvorn.

Galvorn C **Fiber Tow**	
Linear Density, tex	30.00
Conductivity, MS/m*	4.90
Resistance, Ω/m	8.00
Density, g/cm^3*	1.30
Break Force, kg	1.80
Tensile Strength, GPa*	0.70
Tenacity (N/tex)	0.55
Young's Modulus, GPa	20.00
Diameter, µm	38
Available lengths, m	1 - 10,000
Available number of filaments per tow	20 - 200



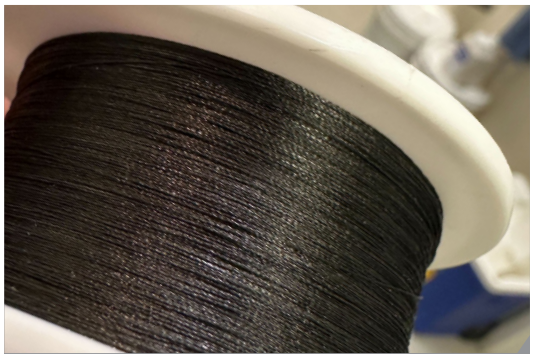
GALVORN C FIBER TOW

Galvorn C fiber tow consisting of many individual fiber filaments.

* Properties for individual filaments in the tow

Note: Listed Galvorn properties were measured at 21 ± 2°C and 50 ± 10% relative humidity.

Galvorn C **Yarn**	
Linear Density, tex	90.00
Conductivity, MS/m	3.00
Resistance, Ω/m	2.80
Density, g/cm^3	0.80
Break Force, kg	6.00
Tensile Strength, GPa	0.53
Tenacity (N/tex)	0.65
Young's Modulus, GPa	20.00
Diameter, µm	400
Available lengths, m	1 - 10,000



GALVORN C YARN

Galvorn fibers are twisted or braided into yarn to hold fibers together and increase diameter.

DEXMAT

GALVORN CAN DO THE WORK OF INCUMBENT MATERIALS WITH FAR LOWER EMISSIONS

It's time to re-think how materials get the job done. Galvorn's specific strength is higher than incumbents so you need less of it to do the same work. And because producing it is fundamentally more efficient, displacing these GHG-intense incumbents in structural applications has a massive impact. Likewise, though Galvorn has a lower specific conductivity than copper or aluminum, their displacement leads to lower emissions—even if you need more Galvorn to conduct the same amount of electricity.

WATCH: **Materials at Work**

CONTACT US

DexMat, Inc.
Houston, TX 77082
hello@dexmat.com
www.dexmat.com

DEXMAT