

Honeywell Spectra® fiber



Industrial applications

**Honeywell**

# Overview

Spectra® fiber is one of the world's strongest and lightest fibers; pound-for-pound, fifteen times stronger than steel, more durable than polyester, and has a specific strength that is 40 percent greater than aramid fiber. With outstanding toughness and extraordinary visco-elastic properties, Spectra® fiber can withstand high-load strain-rate velocities, is light enough to float in water and exhibits high resistance to chemicals, water, and ultraviolet light. Spectra® fiber is used in numerous high-performance applications including ballistic protection, rope and cordage designs and cut-resistant fabrics. Imagine the endless ways that Spectra® fiber can add value to your business or product portfolio.

## CHARACTERISTICS

Lightweight, with a density of 0.97 g/cc, it floats

Pound for pound, 15 times stronger than steel and up to 40% stronger than aramid fibers

Excellent damping characteristics (vibration, shock, impact)

Low dielectric coefficient and loss tangent

Excellent fatigue resistance

Excellent abrasion resistance

Highly cut resistant

High level of protection against ionized radiation and hypervelocity micrometeorites in deep space

Excellent resistance to a wide array of chemicals and water

Good UV resistance

High specific modulus

## APPLICATIONS

High Strength Rope and Cordage

Commercial Fishing Line and Netting

Industrial Cordage and Slings

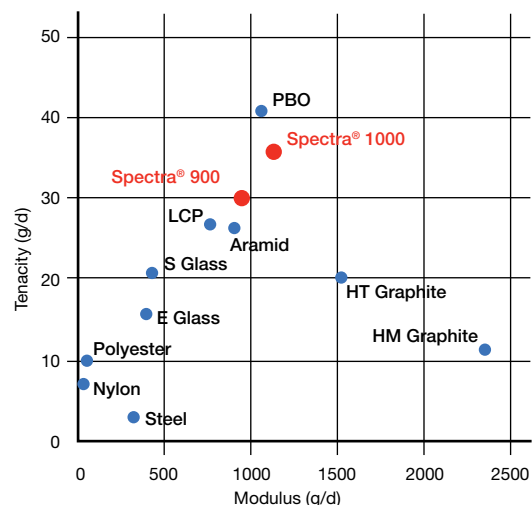
Cut Resistant Gloves and Apparel

Wind Resistant Products

Pipeline Reinforcement

Ballistic Vests, Helmets and Vehicle Protection

HIGH PERFORMANCE FIBER COMPARISON  
(STRENGTH TO STIFFNESS RATIO)



## PHYSICAL PROPERTIES

| (Nominal)                 |           | Spectra® fiber 900 |       |       | Spectra® fiber 1000 |       |       |       |       |       |       |       |
|---------------------------|-----------|--------------------|-------|-------|---------------------|-------|-------|-------|-------|-------|-------|-------|
| Weight/Unit Length        | (Denier)  | 650                | 1200  | 4800  | 215                 | 275   | 375   | 435   | 650   | 1300  | 1600  | 2600  |
|                           | (Decitex) | 722                | 1333  | 5333  | 239                 | 306   | 417   | 483   | 722   | 1444  | 1778  | 2888  |
| Ultimate Tensile Strength | (g/den)   | 30.5               | 30    | 27.4  | 38                  | 36    | 35    | 34.5  | 36    | 35    | 35    | 34    |
|                           | (Gpa)     | 2.61               | 2.57  | 2.34  | 3.25                | 3.08  | 3.00  | 2.95  | 3.08  | 3.00  | 3.00  | 2.91  |
| Breaking Strength         | (lbs)     | 44                 | 79    | 290   | 18.0                | 22.0  | 29.0  | 33.0  | 52.0  | 100.0 | 123.0 | 195.0 |
| Modulus                   | (g/den)   | 920                | 850   | 885   | 1320                | 1320  | 1200  | 1180  | 1175  | 1150  | 1200  | 1135  |
|                           | (Gpa)     | 79                 | 73    | 75    | 113                 | 113   | 103   | 101   | 101   | 98    | 103   | 97    |
| Elongation                | (%)       | 3.6                | 3.9   | 3.6   | 2.9                 | 3.1   | 3.1   | 3.2   | 3.3   | 3.4   | 3.4   | 3.4   |
| Density                   | (g/cc)    | 0.97               | 0.97  | 0.97  | 0.97                | 0.97  | 0.97  | 0.97  | 0.97  | 0.97  | 0.97  | 0.97  |
|                           | (lbs/in3) | 0.035              | 0.035 | 0.035 | 0.035               | 0.035 | 0.035 | 0.035 | 0.035 | 0.035 | 0.035 | 0.035 |
| Filament/tow              |           | 60                 | 120   | 480   | 60                  | 60    | 60    | 120   | 120   | 240   | 240   | 480   |
| Filament                  | (dpf)     | 10.8               | 10.0  | 10.0  | 3.6                 | 4.6   | 6.3   | 3.6   | 5.4   | 5.4   | 6.7   | 5.4   |

# Solutions with Honeywell Spectra® fiber

How can oil and gas companies perform heavy lifting and mooring operations in ultra deep water?

**Honeywell worked with rope and cordage companies and winch manufacturers to incorporate Spectra® fiber into new high strength, light weight rope and cordage designs, enabling oil companies to successfully explore and produce the deeper frontiers.**



How can pipeline distribution companies restore existing pipeline assets to original design pressures without having to dig and replace the pipe?

**Honeywell worked with a pipeline services company to design a high strength liner solution utilizing Spectra® fiber, allowing pipeline companies to potentially reline existing pipelines up to 10 miles in length without the need to dig and replace the pipe.**



How can companies secure the exposed perimeters of assets to prevent intrusion?

**Honeywell worked with a security barrier company to incorporate Spectra® fiber as the strength component of the barrier system and Honeywell's Automated Control Systems product portfolio to provide real-time monitoring capabilities, resulting in an environmentally friendly land and sea security barrier solution.**



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