

## Saturn-12 brings safety and efficiency to mining operations

Saturn-12 has an enhanced coating that improves abrasion resistance and increases residual strength as much as 15–20% when compared with other HMPE lines and their conventional coatings. Its light weight, high strength, and low stretch make it ideal for quick, efficient connections and controlled response. Saturn-12 has been tested in extreme conditions and is proven to provide a longer service life while reducing costs when compared to standard HMPE ropes available today.

Saturn-12 is a torque-free, 12-strand single braid synthetic line that yields the maximum in strength-to-weight ratio and, size-for-size, is the same strength as steel wire rope. At 1/7<sup>th</sup> the weight of wire or chain, Saturn-12 is an excellent replacement for mining operations. This lightweight construction increases safety and operating efficiencies due to fewer handling injuries and less downtime when changing out the line. It has extremely low stretch with superior flex fatigue and wear resistance.

### Features

- Similar to AmSteel®Blue with improved coating to reduce external and internal (yarn-to-yarn) abrasion
- Decreased coefficient of friction at contact surfaces
- Size-for-size strength replacement for wire rope at only 1/7<sup>th</sup> the weight
- Safer handling due to lighter weight and greater flexibility
- Less downtime during change-outs
- Similar elastic elongation to wire rope

### Applications

- Material handling winch lines
- Belt pull-in ropes
- Retrieval and towing assemblies
- Secondary safety ropes for rail cars

SIZE DIAMETER	WEIGHT PER 100 FT	AVG. STRENGTH*	MIN. STRENGTH*	SIZE DIAMETER	WEIGHT PER 100 M	AVG. STRENGTH*	MIN. STRENGTH*
1/2 in	6.4 lb	34,000 lb	30,600 lb	12 mm	9.5 kg	15,400 kg	13,900 kg
9/16 in	7.9 lb	40,500 lb	36,500 lb	14 mm	11.8 kg	18,400 kg	16,500 kg
5/8 in	10.2 lb	52,800 lb	47,500 lb	16 mm	15.2 kg	24,000 kg	21,600 kg
3/4 in	13.3 lb	64,400 lb	58,000 lb	18 mm	19.8 kg	29,200 kg	26,300 kg
13/16 in	17 lb	82,000 lb	73,800 lb	20 mm	25.3 kg	37,200 kg	33,500 kg
7/8 in	19.6 lb	90,800 lb	81,700 lb	22 mm	29.2 kg	41,200 kg	37,100 kg
1 in	21.8 lb	109,000 lb	98,100 lb	24 mm	32.4 kg	49,400 kg	44,500 kg
1-1/16 in	27.5 lb	131,000 lb	118,000 lb	26 mm	40.9 kg	59,400 kg	53,500 kg
1-1/8 in	31.9 lb	148,000 lb	133,000 lb	28 mm	47.5 kg	67,100 kg	60,400 kg
1-1/4 in	36.2 lb	165,000 lb	149,000 lb	30 mm	53.9 kg	74,800 kg	67,400 kg
1-5/16 in	41.8 lb	184,000 lb	166,000 lb	32 mm	62.2 kg	83,500 kg	75,100 kg
1-3/8 in	45 lb	205,000 lb	185,000 lb	34 mm	67 kg	93,000 kg	83,700 kg
1-1/2 in	51.7 lb	228,000 lb	205,000 lb	36 mm	76.9 kg	103,000 kg	93,100 kg
1-5/8 in	65.2 lb	283,000 lb	255,000 lb	40 mm	97 kg	128,000 kg	116,000 kg
1-3/4 in	78.4 lb	335,000 lb	302,000 lb	44 mm	117 kg	152,000 kg	137,000 kg
2 in	87 lb	381,000 lb	343,000 lb	48 mm	129 kg	173,000 kg	156,000 kg
2-1/8 in	109 lb	457,000 lb	411,000 lb	52 mm	162 kg	207,000 kg	187,000 kg
2-1/4 in	116 lb	537,000 lb	483,000 lb	56 mm	173 kg	244,000 kg	219,000 kg
2-1/2 in	148 lb	588,000 lb	529,000 lb	60 mm	220 kg	267,000 kg	240,000 kg
2-5/8 in	167 lb	662,000 lb	596,000 lb	64 mm	248 kg	300,000 kg	270,000 kg
2-3/4 in	187 lb	735,000 lb	662,000 lb	68 mm	278 kg	333,000 kg	300,000 kg
3 in	206 lb	832,000 lb	749,000 lb	72 mm	307 kg	377,000 kg	340,000 kg
3-1/8 in	228 lb	920,000 lb	828,000 lb	76 mm	339 kg	417,000 kg	376,000 kg
3-1/4 in	240 lb	1,007,000 lb	906,000 lb	80 mm	357 kg	457,000 kg	411,000 kg

\*Spliced strength

### Specifications<sup>†</sup>

**FIBER:** Dyneema®  
**SPECIFIC GRAVITY:** 0.98 (floats)  
**STANDARD COLOR:** Orange (sizes 13/16" and above have black longitudinal line)

**ELASTIC ELONGATION**  
 At % of break strength  
 10%..... 0.46%  
 20%..... 0.70%  
 30%..... 0.96%

**SPLICE/CLASS:**  
 For sizes 1/4"–1-1/4"  
 12-strand Class II  
 For sizes above 1-1/4"  
 12-strand Class II Modified Tuck Bury

<sup>†</sup>Due to our continued research and development of product performance, the specifications listed herein are subject to change. For the most current sizes, weights, and strengths, go to [SamsonRope.com](http://SamsonRope.com).

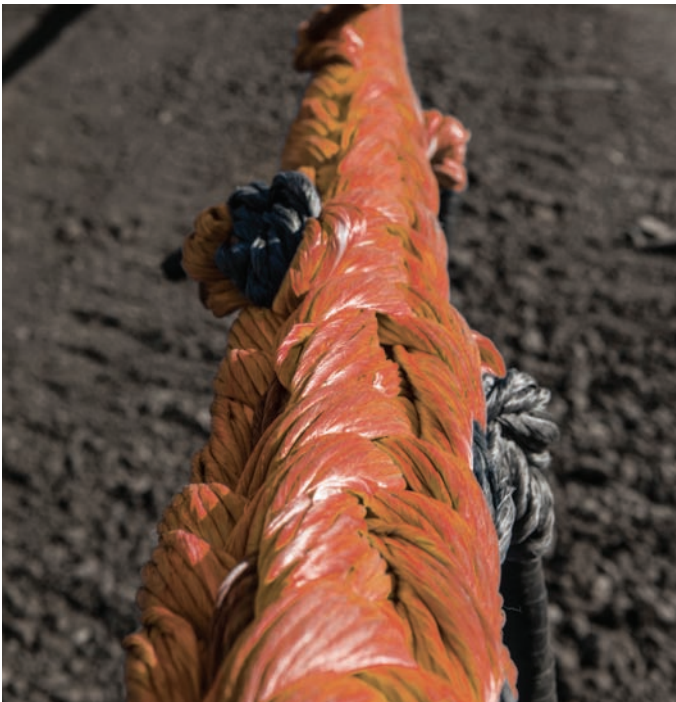


## Samson's Saturn-12: fighting abrasion in mining applications

Working lines used in underground mining applications face extremely abusive environments. Synthetic ropes in this application become indistinguishable from the rock around them as ground earth and rock embeds itself within the braid. HMPE (high modulus polyethylene) ropes bring very high strength and extremely light weight to mining applications. They provide ease of handling, improved personnel safety, and reduced time required for standard operations. Finding the product that lasts the longest in these conditions allows you to add reduced cost to these already compelling benefits.

### Designed to withstand abrasive environments

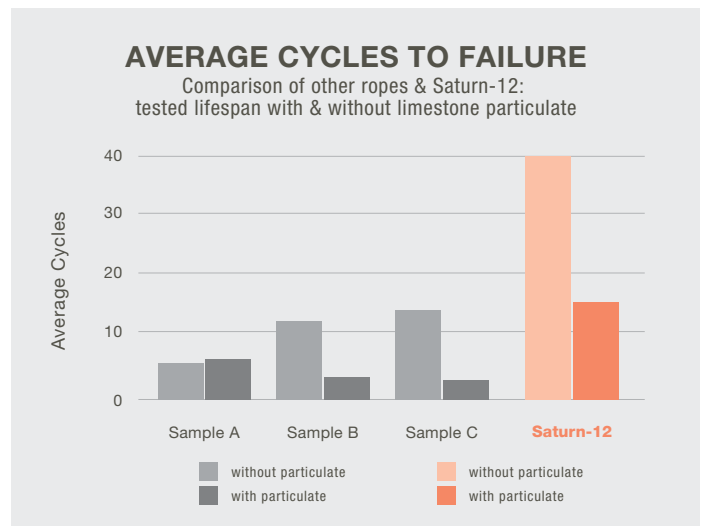
Abrasion is the natural enemy of synthetic ropes. Externally, it causes broken fibers. Internally, drawing ropes over a surface under load can cause relative movement of surface and internal fibers that generates heat and causes fiber-on-fiber abrasion. Saturn-12 has a proprietary coating applied at the yarn level. It has been proven to significantly increase the rope's resistance to abrasion both externally and internally, leading to a significantly longer service life in highly abrasive applications.



### Tested in conditions that mimic the real world of the modern mine

Samson's Research and Development engineers designed a set of tests to mimic actual mine conditions and explore the effect of highly abrasive conditions on HMPE ropes. Testing was carried out at the DSM Dyneema® Technical Center Europe.

Samson engineers assembled four different HMPE ropes, made with both Dyneema® and Spectra® fibers, from three different major manufacturers and subjected them all to standardized lab testing designed to represent typical conditions encountered in a mine. The tests were performed both on unused rope samples and on new ropes impregnated with finely ground limestone to replicate actual mine conditions.



Samples impregnated with limestone particulate, tested at a relative load (10% of ABL): Saturn-12 cycles to failure were more than 5 times higher than the average of the other three ropes tested.

**The results:** Test results for new, untreated rope samples at a fixed load show Saturn-12 has nearly three times the useful service life under abrasive conditions. While that is significant, the results for ropes impregnated with the ground limestone were even better.

For more details of the test procedures, see Samson's Technical Bulletin: *Abrasion Testing for Mining Working Ropes*, available at [SamsonRope.com](http://SamsonRope.com).