

S611T Marine Fiber Optic Cables

Tight buffer construction

2 to 48 fibers / single-mode or multimode / LSZH



Applications

The S611T series of Marine Shipboard unarmored fiber optic cables are designed especially for the harsh environments of commercial marine vessels, offshore oil platforms, drilling rigs, and other similar applications.

S611T low smoke/ zero halogen, flame retardant cables offer versatility and ease of installation in a construction suited for marine applications. They are compliant with the latest IEC requirements.

S611T cables meet the requirements of IEC 60793-1 and IEC 60792-2 specifications, are encapsulated in all dielectric, tight buffered construction, individually reinforced with aramid yarns and jacketed (breakout style). The breakout components are cabled around a central member providing additional tensile strength to the entire construction. The thermoplastic low smoke/ zero halogen jacketing system offers excellent resistance to chemicals, fluids, fungus, and abrasion.

Features/Ratings

- Low smoke/zero halogen construction meets appropriate IEEE and IEC standards for fire, smoke, and toxicity
- Superior resistance to oil, abrasion, moisture, sunlight, crush and impact
- Gigabit ethernet 802.3Z compliant

Approvals

Meets IEC60794-1-1, 60794-1-2 and 60794-2

Meets IEEE 45 and IEEE 1580

Det Norske Veritas (DNV)

American Bureau of Shipping (ABS)

Lloyd's Register of Shipping (LRS)

Flame retardant per IEC 60332-3 CAT. A/F and IEEE 1202

Smoke density requirements of IEC 61034-1 and 61034-2

Acid gas generation requirements of IEC 60754-1 & 60754-2

Toxicity requirements of NES 713

Meets the performance requirements of IEEE 802.3z (Gigabit ethernet)

Construction

CENTRAL STRENGTH MEMBER: Dielectric material (epoxy fiberglass rod).

FIBER: Multimode or single-mode fibers with an easily-strippable 900µm tight buffering colored per TIA/EIA 598.

SUBUNIT STRENGTH MEMBER: Aramid yarn.

SUBUNIT JACKET: 2.0 mm ChromaTek-L™ Halex low smoke zero halogen polyolefin.

SHEATH: ChromaTek-L™ Halex low smoke zero halogen polyolefin.



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S611T Marine Fiber Optic Cables

Tight buffer construction

2 to 48 fibers / single-mode or multimode / LSZH

Draka usa Part Number	Number of Fibers	INSTALLATION		OPERATING		Cable Outside Diameter	Approximate Cable Weight
		Pull Strength Newtons (lbs)	Bend Radius cm (in)	Tension Newtons (lbs)	Bend Radius cm (in)	mm (in)	Kg/Km (Lbs/Mft)
S611T-02R-xyy	2	600 (135)	13.6 (5.3)	200 (45)	6.8 (2.7)	6.78 (0.267)	49 (33)
S611T-04-xyy	4	600 (135)	15.3 (6.0)	200 (45)	7.7 (3.0)	7.67 (0.302)	60 (40)
S611T-06-xyy	6	600 (135)	17.3 (6.8)	200 (45)	8.6 (3.4)	8.64 (0.340)	85 (57)
S611T-08-xyy	8	600 (135)	20.0 (7.8)	200 (45)	10.0 (3.9)	10.01 (0.394)	100 (67)
S611T-10-xyy	10	600 (135)	22.4 (8.8)	200 (45)	11.2 (4.4)	11.23 (0.442)	127 (85)
S611T-12-xyy	12	600 (135)	25.0 (9.8)	200 (45)	12.5 (4.9)	12.47 (0.491)	158 (106)
S611T-16-xyy	16	2700 (600)	25.2 (10.0)	600 (135)	12.6 (5.0)	12.62 (0.497)	161 (108)
S611T-18-xyy	18	2700 (600)	25.2 (10.0)	600 (135)	12.6 (5.0)	12.62 (0.497)	159 (107)
S611T-24-xyy	24	2700 (600)	29.3 (11.6)	600 (135)	14.7 (5.8)	14.66 (0.577)	204 (137)
S611T-36-xyy	36	2700 (600)	34.0 (13.4)	600 (135)	17.0 (6.7)	17.02 (0.670)	260 (175)
S611T-48-xyy	48	2700 (600)	42.7 (16.8)	600 (135)	21.4 (8.4)	21.36 (0.841)	350 (235)

Replace the xyy with the Fiber Designation in the fiber performance table below. NOTE: Fibers are not suitable for F07 crimp and cleave connector. Information is subject to change without notice. Consult factory for a variety of alternate constructions for specific applications

FIBER PERFORMANCE

	62.5µm MULTIMODE	50µm MULTIMODE	200µm MULTIMODE	8.3µm SINGLE-MODE
Fiber Designation	62X	50H	200S	010X
Applicable Specification	IEC 60793-10 Type A1b	ITU G.651 & IEC 60793-10 Type A1a.1	ITU G.651 & IEC 60793-10 Type A1a	
Fiber Type	Graded Index	Graded Index	Step Index	Matched Clad
Core Diameter	62.5µm ±2.5µm	50µm ±2.5µm	200µm ±5µm	8.3µm Nominal
Cladding Diameter	125µm ±1µm	125µm ±1µm	230µm ±10µm	125µm ±7µm
Coating Diameter	242µm ±7µm	242µm ±5µm	500µm ±30µm	242µm ±1µm
Buffer Diameter	900µm ±50µm	900µm ±50µm	900µm ±50µm	900µm ±50µm
Numerical Aperture	0.275 ±0.015	0.200 ±0.015	.037 Nominal (2m 5% intensity)	n/a
Mode Field Diameter	n/a	n/a	n/a	9.0µm ±0.4µm
Attenuation	≤ 3.5 dB/Km @ 850nm ≤ 1.5 dB/Km @ 1300nm	≤ 3.5 dB/Km @ 850nm ≤ 1.5 dB/Km @ 1300nm	≤ 12.0 dB/Km @ 820nm	≤ 0.70 dB/Km @ 1310nm ≤ 0.70 dB/Km @ 1550nm
Bandwidth	≥ 200 MHz/Km @ 850nm ≥ 500 MHz/Km @ 1300nm	≥ 500 MHz/Km @ 850nm ≥ 500 MHz/Km @ 1300nm	≥ 20 MHz/Km @ 820nm	n/a n/a
Dispersion	n/a n/a	n/a n/a	n/a n/a	≤ 3.0 ps/nm-Km @ 1285-1330nm ≤ 18 ps/nm-Km @ 1550nm
Proof Test	100,000 psi	100,000 psi	100,000 psi	100,000 psi

CABLE PROPERTIES

Crush (IEC 60794-1-E3)
Impact (IEC 60794-1-E4)
Torsion (IEC 60794-1-E7)
Cable Bend (IEC 60794-1-E11)

3000 N/ 10 cm
20 impacts, 5J
+ 1 turn / 2 m, 100 cycles
<0.1 dB/ + 6 turns

FIRE, SMOKE, AND TOXICITY CLASSIFICATIONS

Flame retardant: IEC 60332-3, CAT.A CAT A/F and IEEE 1202
Smoke density: IEC 61034-1 and IEC 61034-2
Acid gas penetration: IEC 60754-1 and IEC 60754-2
Toxicity: NES 713

TEMPERATURE RANGE

Operation: -20°C to +80°C
Installation: -10°C to +60°C
Storage: -40°C to +80°C

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S670T Armored and Sheathed Marine Fiber Optic Cables

Tight buffer construction

2 to 48 fibers / single-mode or multimode / LSZH / armored and sheathed



Applications

The S670T series of Marine Shipboard armored fiber optic cables are designed especially for the harsh environments of commercial marine vessels, offshore oil platforms, drilling rigs, and other similar applications.

S670T low smoke/zero halogen, flame retardant cables offer versatility and ease of installation in a construction suited for marine applications. They are compliant with the latest IEC requirements.

S670T cables meet the requirements of IEC 60793-1 and IEC 60792-2 specifications, are encapsulated in all dielectric, tight buffered construction, individually reinforced with aramid yarns and jacketed (breakout style). The breakout components are cabled around a central member providing additional tensile strength to the entire construction. The thermoplastic low smoke/zero halogen double jacketing system under and over the marine grade bronze braided armor offers excellent resistance to chemicals, fluids, fungus, and abrasion.

Features/Ratings

- Low smoke/zero halogen construction meets appropriate IEEE and IEC standards for fire, smoke, and toxicity
- Superior resistance to oil, abrasion, moisture, sunlight, crush and impact
- Gigabit ethernet 802.3Z compliant
- Armored and sheathed construction offers additional mechanical & environmental protection

Approvals

Meets IEC60794-1-1, 60794-1-2 and 60794-2

Meets IEEE 45 and IEEE 1580

Det Norske Veritas (DNV)

American Bureau of Shipping (ABS)

Lloyd's Register of Shipping (LRS)

Flame retardant per IEC 60332-3 CAT. A/F and IEEE 1202

Smoke density requirements of IEC 61034-1 and 61034-2

Acid gas generation requirements of IEC 60754-1 & 60754-2

Toxicity requirements of NES 713

Meets the performance requirements of IEEE 802.3z (Gigabit ethernet)

Construction

CENTRAL STRENGTH MEMBER: Dielectric material (epoxy fiberglass rod).

FIBER: Multimode or single-mode fibers with an easily-strippable 900µm tight buffering colored per TIA/EIA 598.

SUBUNIT STRENGTH MEMBER: Aramid yarn

SUBUNIT JACKET: 2.0 mm ChromaTek-L™ Halex low smoke zero halogen polyolefin.

JACKET: ChromaTek-L™ Halex low smoke zero halogen polyolefin.

ARMOR: Braided bronze in accordance with IEEE 1580 (2010)

SHEATH: ChromaTek-L™ Halex low smoke zero halogen polyolefin.



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S670T Armored and Sheathed Marine Fiber Optic Cables

Tight buffer construction

2 to 48 fibers / single-mode or multimode / LSZH / armored and sheathed

Draka usa Part Number	Number of Fibers	INSTALLATION		OPERATING		Cable Outside Diameter	Approximate Cable Weight
		Pull Strength Newtons (lbs)	Bend Radius cm (in)	Tension Newtons (lbs)	Bend Radius cm (in)	mm (in)	Kg/Km (Lbs/Mft)
S670T-02R-xyy	2	600 (135)	22.4 (8.8)	200 (45)	11.2 (4.4)	11.23 (.442)	204 (137)
S670T-04-xyy	4	600 (135)	25.0 (9.8)	200 (45)	12.5 (4.9)	12.45 (.490)	210 (141)
S670T-06-xyy	6	600 (135)	25.6 (10.2)	200 (45)	12.8 (5.1)	12.83 (.505)	238 (160)
S670T-08-xyy	8	600 (135)	28.5 (11.2)	200 (45)	14.3 (5.6)	14.32 (.564)	287 (193)
S670T-10-xyy	10	600 (135)	31.4 (12.4)	200 (45)	15.7 (6.2)	15.65 (.616)	345 (232)
S670T-12-xyy	12	600 (135)	33.8 (13.4)	200 (45)	16.9 (6.7)	16.92 (.666)	400 (268)
S670T-16-xyy	16	2700 (600)	33.8 (13.4)	600 (135)	16.9 (6.7)	16.92 (.666)	393 (264)
S670T-18-xyy	18	2700 (600)	33.8 (13.4)	600 (135)	16.9 (6.7)	16.92 (.666)	391 (263)
S670T-24-xyy	24	2700 (600)	39.0 (15.4)	600 (135)	19.5 (7.7)	19.51 (.768)	472 (317)
S670T-36-xyy	36	2700 (600)	44.7 (17.6)	600 (135)	22.4 (8.8)	22.35 (.880)	595 (400)
S670T-48-xyy	48	2700 (600)	57.8 (22.8)	600 (135)	28.9 (11.4)	28.91 (1.138)	954 (641)

Replace the xyy with the Fiber Designation in the fiber performance table below. NOTE: Fibers are not suitable for F07 crimp and cleave connector. Information is subject to change without notice. Consult factory for a variety of alternate constructions for specific applications.

FIBER PERFORMANCE

	62.5µm MULTIMODE	50µm MULTIMODE	200µm MULTIMODE	8.3µm SINGLE-MODE
Fiber Designation	62X	50H	200S	010X
Applicable Specification	IEC 60793-10 Type A1b	ITU G.651 & IEC 60793-10 Type A1a.1	ITU G.651 & IEC 60793-2 Type A1a	
Fiber Type	Graded Index	Graded Index	Step Index	Matched Clad
Core Diameter	62.5µm ±2.5µm	50µm ±2.5µm	200µm ±5µm	8.3µm Nominal
Cladding Diameter	125µm ±1µm	125µm ±1µm	230µm ±10µm	125µm ±1µm
Coating Diameter	242µm ±7µm	242µm ±7µm	500µm ±30µm	242µm ±7µm
Buffer Diameter	900µm ±50µm	50µm ±2.5µm	900µm ±50µm	900µm ±50µm
Numerical Aperture	0.275 ±0.015	0.200 ±0.015	.037 Nominal (2m 5% intensity)	n/a
Mode Field Diameter	n/a	n/a	n/a	9.1µm ±0.4µm
Attenuation	≤ 3.5 dB/Km @ 850nm ≤ 1.0 dB/Km @ 1300nm	≤ 3.5 dB/Km @ 850nm ≤ 1.0 dB/Km @ 1300nm	≤ 12.0 dB/Km @ 820nm	≤ 0.70 dB/Km @ 1310nm ≤ 0.70 dB/Km @ 1550nm
Bandwidth	≥ 200 MHz/Km @ 850nm ≥ 500 MHz/Km @ 1300nm	≥ 500 MHz/Km @ 850nm ≥ 500 MHz/Km @ 1300nm	≥ 20 MHz/Km @ 820nm	n/a n/a
Dispersion	n/a n/a	n/a n/a	n/a n/a	≤ 3.0 ps/nm-Km @ 1285-1330nm ≤ 18 ps/nm-Km @ 1550nm
Proof Test	100,000 psi	100,000 psi	100,000 psi	100,000 psi

CABLE PROPERTIES

Crush (IEC 60794-1-E3) 3000 N/ 10 cm
Impact (IEC 60794-1-E4) 20 impacts, 5J
Torsion (IEC 60794-1-E7) + 1 turn / 2 m, 100 cycles
Cable Bend (IEC 60794-1-E11) <0.1 dB/ + 6 turns

TEMPERATURE RANGE

Operation: -20°C to +80°C
Installation: -10°C to +60°C
Storage: -40°C to +80°C

FIRE, SMOKE, AND TOXICITY CLASSIFICATIONS

Flame retardant: IEC 60332-3, CAT.A CAT A/F and IEEE 1202
Smoke density: IEC 61034-1 and IEC 61034-2
Acid gas penetration: IEC 60754-1 and IEC 60754-2
Toxicity: NES 713

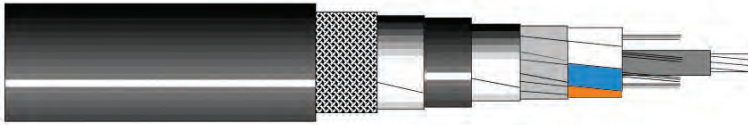
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Fire Resistant QFCI/O/RM-JM/-F1

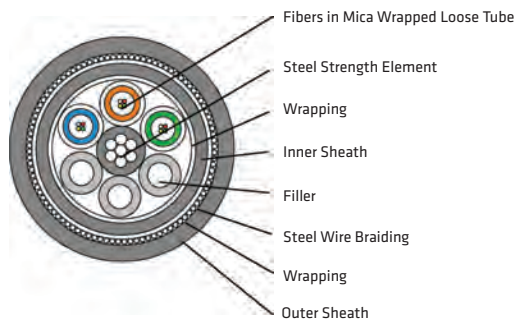
Indoor and outdoor, fire resistant, flame retardant halogen-free loose tube



Applications

Optical cable for indoor and outdoor use in vital communication and emergency systems that need to be operational during fire. The cable has a patented design that ensures operation for more than 3 hours in fires up to 1000°C. The cable is halogen free and flame retardant to protect against secondary damage to electronic equipment during and after fire. Outer sheath is made from black UV-stabilized and weather resistant material and may be exposed for shorter periods to fluids such as diesel, petrol, glycol, ethanol, white spirit and ASTM oil 2.

The resistance to these fluids is according to DOD-STD-1678, method 8030. The cable is reinforced with a steel wire braiding. The fibers are protected in gel-filled loose tubes stranded around a central strength member to ensure optimum performance and long life. Each fiber and loose tube is color coded for easy identification during splicing and termination. The outer sheath is marked to show fiber type and cable type.



Cable Properties

- **Tensile strength** (IEC 60794-1-2E1)
 - Max tensile load during installation 1500 N
 - Max tensile load during operation 500 N
- **Color Coding** (TIA/EIA-455-598C)
- **Crush** (IEC 60794-1-2E3) 3000 N/10cm
- **Impact** (IEC 60794-1-2E4) 20 impacts, 5J
- **Torsion** (IEC 60794-1-2E7) ± 1 turn/1m
- **Cable bending**
 - Minimum bending diameter 250 mm
 - Cable bend (IEC 60794-1-2E11) < 0.1dB/ ± 5 turn
- **Temperature window**
 - Operation -30°C to +60°C
 - Installation -10°C to +60°C
 - Storage -40°C to +70°C
- **Chemical resistance**
 - Mineral oils IRM 902 (IEC60811-2-1) - 7 days/23°C
 - 4 hours/70°C
 - Diesel - IRM 903 (IEC60811-2-1) - 7 days/23°C
 - 4 hours/70°C
- **Fire and smoke classifications**
 - IEC 60331-25 (750°C, 3 hours) <1 dB excess loss
 - Upgraded IEC 60331-25 (1000°C, 3 hours) <1.5 dB excess loss
 - BP-236
 - IEC 61034
 - IEC 60332-3 cat. A and C
 - IEC 60754-1
 - IEC 60754-2

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Fire Resistant QFCI/O/RM-JM/-F1

Indoor and outdoor, fire resistant, flame retardant halogen-free loose tube

Fiber Type	9/125 ITU-T G652.D	50/125 OM2	62.5/125 OM1
Core Diameter	8.3 μ m (typical)	50 $\pm$ 2.5 μ m	62.5 $\pm$ 2.5 μ m
Mode Field Diameter	1310 nm 9.0 $\pm$ 0.4 μ m 1550 nm 10.1 $\pm$ 0.5 μ m	n/a	n/a
Cladding Diameter	125 $\pm$ 0.7 μ m	125 $\pm$ 1.0 μ m	125 $\pm$ 1.0 μ m
Primary Coating Diameter	242 $\pm$ 7 μ m	242 $\pm$ 5 μ m	242 $\pm$ 5 μ m
Attenuation of Finished Cable			
850 nm	n/a	$\leq$ 3.5 dB/km	$\leq$ 3.0 dB/km
1300 nm	n/a	$\leq$ 1.5 dB/km	$\leq$ 1.0 dB/km
1310 nm	$\leq$ 0.40 dB/km	n/a	n/a
1550 nm	$\leq$ 0.30 dB/km	n/a	n/a
Bandwidth			
850 nm	n/a	> 500 MHz $\cdot$ km	>200 MHz $\cdot$ km
1300 nm	n/a	> 500 MHz $\cdot$ km	>500 MHz $\cdot$ km
Dispersion			
1285-1330 nm	< 3.0 ps/nm $\cdot$ km	n/a	n/a
1550 nm	< 18 ps/nm $\cdot$ km	n/a	n/a
Numerical Aperture	0.13 (typical)	0.200 $\pm$ 0.015	0.275 $\pm$ 0.015
Minimum Permanent			
Bending Diameter	25 mm	75 mm	75 mm

Other fiber types and qualities are available on request.

Ordering Information

Fiber Count	Single Mode Fiber	50/125 Fiber	62.5/125 Fiber
	Part Number	Part Number	Part Number
2	QFCI2-02R-010X	QFCI2-02R-50H	QFCI2-02R-62X
4	QFCI4-04-010X	QFCI4-04-50H	QFCI4-04-62X
6	QFCI6-06-010X	QFCI6-06-50H	QFCI6-06-62X
8	QFCI4-08-010X	QFCI4-08-50H	QFCI4-08-62X
10	QFCI2-10-010X	QFCI2-10-50H	QFCI2-10-62X
12	QFCI6-12-010X	QFCI6-12-50H	QFCI6-12-62X
16	QFCI4-16-010X	QFCI4-16-50H	QFCI4-16-62X
20	QFCI4-20-010X	QFCI4-20-50H	QFCI4-20-62X
24	QFCI6-24-010X	QFCI6-24-50H	QFCI6-24-62X
32	QFCI8-32-010X	QFCI8-32-50H	QFCI8-32-62X
40	QFCI8-40-010X	QFCI8-40-50H	QFCI8-40-62X
48	QFCI8-48-010X	QFCI8-48-50H	QFCI8-48-62X

Number of Fibers	Number of Fibers in Each Tube	Number of Tubes + Fillers	Loose Tube Diameter (mm)	Outer Diameter (mm)	Weight (kg/km)	Heat Release (MJ/km)
2	2	1+5	2.2	14.3	307	1,390
4	4	1+5	2.2	14.3	307	1,390
6	6	1+5	2.2	14.3	307	1,325
8	4	2+4	2.2	14.3	307	1,381
10	2	5+1	2.2	14.3	307	1,201
12	6	2+4	2.2	14.3	307	1,324
16	4	4+2	2.2	14.3	307	1,264
20	4	5+1	2.2	14.3	307	1,201
24	6	4+2	2.2	14.3	307	1,138
32	8	4+2	2.2	14.3	307	1,264
40	8	5+1	2.2	14.3	307	1,201
48	8	6+0	2.2	14.3	307	1,138

The data herein is approximate and subject to normal manufacturing tolerances. Other fiber counts are available on request.

Table 1 - TIA/EIA Fiber Optic Color Codes

TIA/EIA Fiber Optic Color Codes					
Position	Base Color	Position	Base Color with Stripe	Position	Base Color with Stripe
1	Blue	13	Blue with Black Stripe	25	Blue with Red Stripe
2	Orange	14	Orange with Black Stripe	26	Orange with Red Stripe
3	Green	15	Green with Black Stripe	27	Green with Red Stripe
4	Brown	16	Brown with Black Stripe	28	Brown with Red Stripe
5	Slate	17	Slate with Black Stripe	29	Slate with Red Stripe
6	White	18	White with Black Stripe	30	White with Red Stripe
7	Red	19	Red with Black Stripe	31	Red with Yellow Stripe
8	Black	20	Black with Yellow Stripe	32	Black with Red Stripe
9	Yellow	21	Yellow with Black Stripe	33	Yellow with Red Stripe
10	Violet	22	Violet with Black Stripe	34	Violet with Red Stripe
11	Rose	23	Rose with Black Stripe	35	Rose with Red Stripe
12	Aqua	24	Aqua with Black Stripe	36	Aqua with Red Stripe

Table 2 - Bostrig™ Conductor Information

Conductor Size	Conductor Stranding	Nominal Diameter (inches)	Maximum DC Resistance @25C (ohms/1000ft)
22 AWG	19/34	0.029	18.46
20 AWG	19/32	0.039	11.62
18 AWG	19/30	0.048	6.342
16 AWG	19/29	0.056	4.527
14 AWG	19/27	0.071	2.835
12 AWG	19/25	0.088	1.784
10 AWG	27/24	0.117	1.101
8 AWG	41/24	0.146	0.692
6 AWG	63/24	0.207	0.445
5 AWG	91/24	0.235	0.353
4 AWG	105/24	0.261	0.279
3 AWG	133/24	0.280	0.221
2 AWG	161/24	0.330	0.175
1 AWG	224/24	0.380	0.128
1/0 AWG	273/24	0.403	0.106
2/0 AWG	342/24	0.455	0.0885
3/0 AWG	456/24	0.527	0.0646
4/0 AWG	551/24	0.570	0.0530
262 KCMIL	646/24	0.627	0.0459
313 KCMIL	777/24	0.695	0.0383
373 KCMIL	925/24	0.750	0.0319
444 KCMIL	1110/24	0.820	0.0269
535 KCMIL	1332/24	0.895	0.0223
646 KCMIL	1591/24	0.981	0.0186
777 KCMIL	1924/24	1.085	0.0154
1111 KCMIL	2745/24	1.298	0.0110

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