

mandals
SINCE 1775

AGRICULTURE

WORLD CLASS LAY-FLAT HOSES

- DRAG HOSE SYSTEM

- SLURRY TRANSFER

- IRRIGATION

- SUPPLY LINE

NORWEGIAN TECHNOLOGY
Part of the Michelin Group

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Legacy Through Innovation





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WHY LAY-FLAT HOSES?

Flexible lay-flat hoses offer many advantages over more rigid types of hoses or pipes, and areas of use have increased over the years. Lay-flat hoses are now the preferred solution in many fluid transfer applications in various segments.

Our hoses meet the required quality needed for the most demanding situations. Lay-flat hoses provide the flexibility and mobility to streamline efficient use and offer many positive HSE benefits.

HISTORY

At the southern tip of Norway, Mandals was established in 1775 as a rope manufacturing company for the sailing industry.

In 1927 and in the persistence of improving the production of hoses, Mandals introduced its first "circular weaving loom".

Ever since, the company has been a pioneer in the development of this technology, and with it, our premium lay-flat hoses emerged.

The "**extrusion-through-the-weave**" was firstly applied for nitrile rubber, but as our knowledge developed, thermoplastic polyurethane (TPU) was successfully introduced in the early 1980s giving global recognition to the company for such an achievement.

All over the world, in fields, deserts, mines and deep waters, our lay-flat hoses transport all types of liquids continuously supporting a steady operation for our customers.

Generations of experience have taught us to develop high-performance looms, super thin and strong weave-jackets and an extrusion for maximum adhesion through the weave.

The result is a lay-flat hose you can rely on for years.



18TH & 19TH CENTURY



20TH & 21ST CENTURY



NITRILE RUBBER

Up to 6 inch diameter (152mm)

THERMOPLASTIC POLYURETHANE (TPU)

Up to 12 inch diameter (305 mm)

EXTRUSION THROUGH THE WEAVE

Gives a very strong bond between the embedded weave and the TPU or rubber cover

ISO 9001 CERTIFICATION

Product development and quality is our strength

ADVANTAGES

EASY MAINTENANCE AND REPAIR

- Minimal maintenance even in harsh environments
- Stable diameter after use allows easy recoupling
- Quick on-site repair possible, no special tools
- Lower labour and equipment costs
- Reduced downtime

LOW OPERATING COSTS

- Excellent flow rates
- Minimal pressure loss, low friction
- Swelling allows full pumping efficiency
- Long lengths and few joints / less manpower
- Less leaking and risk of spills

LONG SERVICE LIFE

- High resistance to abrasion and cutting
- Continuous operation at high pressures
- Durable even in the roughest environments
- No delamination
- Resistant to heat, UV-rays, ozone, many chemicals and weathering
- Resistant to hydrolysis and microbiological attack
- Withstands settings in the ground



UMBILICAL DRAG HOSE SYSTEM

Mandals lay-flat hoses have been the preferred solution in global agricultural sector for decades. The durability and wear resistance provide long lasting hoses for such demanding use.

Quick deployment and retrieval, combined with excellent flow rates and long life time, reduce operating cost.

We offer hoses especially designed for use with umbilical drag hose systems. This ensures environmentally friendly and safe manure distribution, and also prevents hard-packing of the soil.

Mandals Superman is a hose intended for large volume transfer under high pressure and is widely used as supply hoses for large agricultural systems.

Mandals Ultraman is a multipurpose transfer hose, which is suitable as a feeder hose or even as a drag hose in smaller umbilical systems.

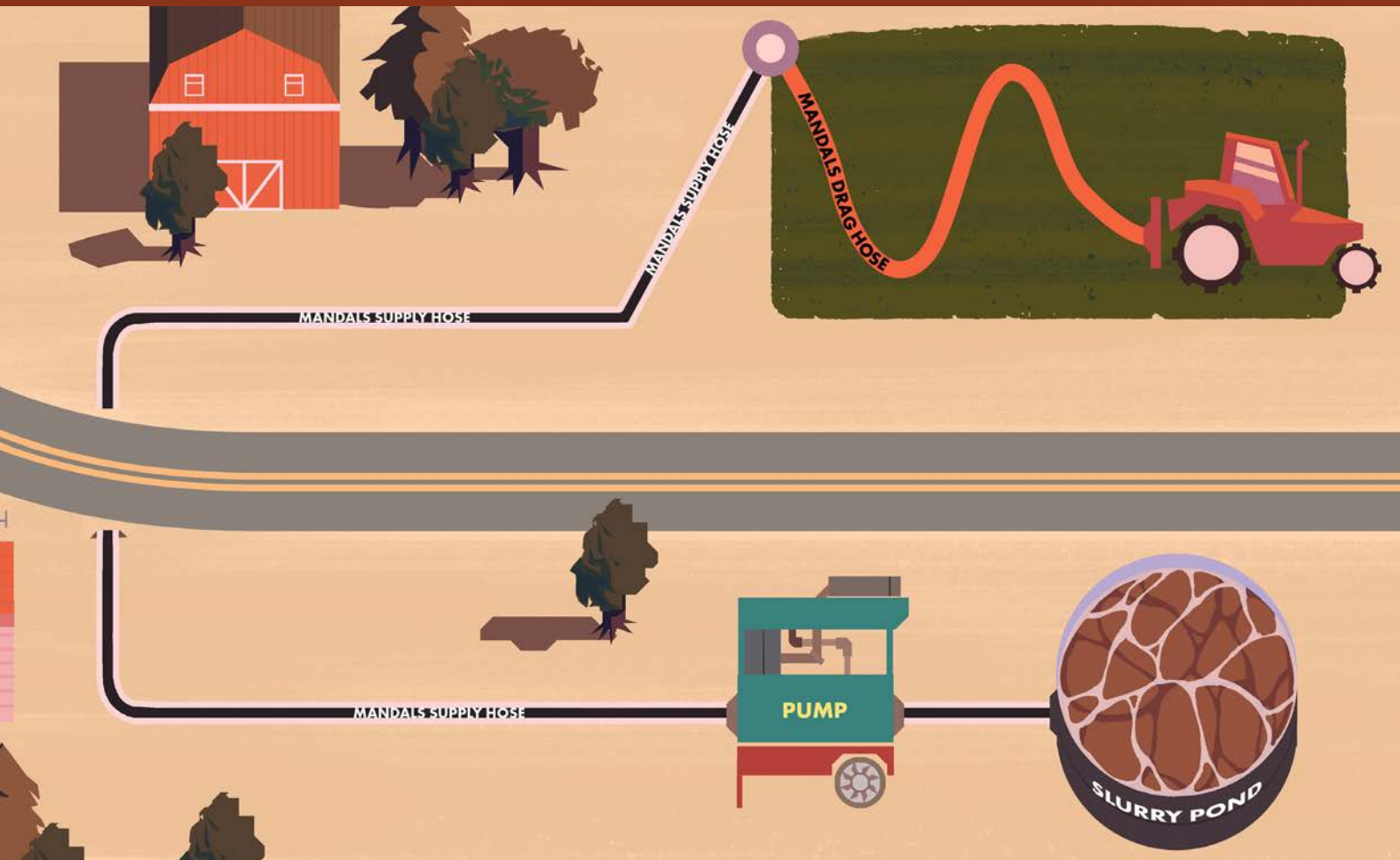
Mandals Flexitex Standard is a general purpose hose for use in agricultural systems.

Mandals Flexitex Extra is a more reinforced fluid transfer hose for agricultural systems, but may also serve as a drag hose in smaller umbilical systems.

Mandals Dragman is especially designed to withstand the extreme tensile stress, pulling forces and abrasion from umbilical slurry systems.

DRAGMAN TPU DRAG LINE





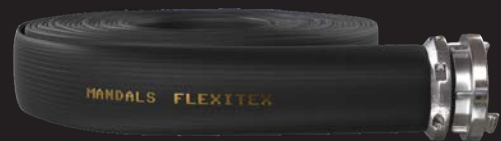
SUPERMAN HVT

TPU SUPPLY LINE



FLEXITEX EXTRA

RUBBER SUPPLY LINE



SLURRY TRANSFER
IRRIGATION LINE



SLURRY TRANSFER
IRRIGATION LINE

TPU SUPPLY LINE

SUPERMAN HVT

This Premium Lay-flat hose has been designed for long life and maintenance-free service in the harshest environments. The best choice for transfer of large volumes under high pressure, and is widely used as supply hoses for large agricultural systems.



ULTRAMAN

Ultraman is a multi purpose transfer hose, which is suitable as a feeder hose or even as a drag hose in smaller umbilical systems. Also suitable for irrigation. Longer lengths available for some diameters.



TECHNICAL DATA - SUPERMAN HVT

INNER DIAMETER		WALL THICKNESS		WEIGHT		BURST PRESSURE		TENSILE STRENGTH	
Inch	mm	Inch	mm	Lbs / ft	Kg / m	Psi	Bar	X1000 kbs	Tons
5	127 + 2,5	0,14	3,5	1,07	1,70	650	45	34,8	15,8
6	152 + 3	0,15	3,7	1,34	2,00	600	42	46,3	21,0
7	178 + 3	0,16	4,0	1,63	2,40	600	42	73,4	33,3
8	203 + 3	0,17	4,2	2,15	3,20	600	42	85,3	38,7
10	254 + 4	0,17	4,3	2,73	4,10	520	36	105,6	47,9
12	305 + 5	0,18	4,5	3,43	5,15	430	30	130,1	59,0

TECHNICAL DATA - ULTRAMAN

INNER DIAMETER		WALL THICKNESS		WEIGHT		BURST PRESSURE		TENSILE STRENGTH	
Inch	mm	Inch	mm	Lbs / ft	Kg / m	Psi	Bar	X1000 kbs	Tons
2	51 + 2	0,11	2,7	0,35	0,52	940	65	13,7	6,2
2 1/2	65 + 2	0,11	2,8	0,44	0,66	790	55	13,7	6,2
3	76 + 2	0,11	2,8	0,52	0,78	780	54	19,2	8,7
3 1/2	90 + 2	0,11	2,9	0,64	0,95	620	43	22,3	10,1
4	102 + 2,5	0,13	3,2	0,77	1,15	580	40	25,1	11,4
4 1/2	114 + 2,5	0,13	3,2	0,91	1,35	530	37	26,4	12,0
5	127 + 2,5	0,13	3,2	1,01	1,50	460	32	29,5	13,4
6	152 + 3	0,13	3,2	1,14	1,70	430	30	36,6	16,6

IRRIGATION LINE

FLEXITEX STANDARD

Mandals Flexitex Standard is intended for use as feeder hose for smaller irrigation and slurry units in the agricultural sector.

FLEXITEX EXTRA

Mandals Flexitex Extra is a reinforced fluid transfer lay-flat hose for agricultural systems, but it may also serve as drag hose in smaller umbilical system, or for irrigation.



TECHNICAL DATA - FLEXITEX STANDARD

INNER DIAMETER		WALL THICKNESS		WEIGHT		BURST PRESSURE		TENSILE STRENGTH	
Inch	mm	Inch	mm	Lbs / ft	Kg / m	Psi	Bar	X1000 kbs	Tons
1 1/2	38 + 1,6	0,09	2,2	0,21	0,31	800	60	7,1	3,2
2	51 + 2	0,09	2,2	0,29	0,43	655	45	9,0	4,1
2 1/2	65 + 2	0,09	2,2	0,36	0,54	655	45	11,5	5,2
3	76 + 2	0,10	2,5	0,48	0,72	655	45	16,5	7,5
3 1/2	90 + 2	0,11	2,7	0,66	0,98	580	42	22,3	10,1
4	102 + 2,5	0,11	2,7	0,74	1,10	510	32	22,1	10,0
6	150 + 3	0,13	3,4	1,27	1,90	580	40	40,8	18,5

TECHNICAL DATA - FLEXITEX EXTRA

INNER DIAMETER		WALL THICKNESS		WEIGHT		BURST PRESSURE		TENSILE STRENGTH	
Inch	mm	Inch	mm	Lbs / ft	Kg / m	Psi	Bar	X1000 kbs	Tons
2	51 + 2	0,10	2,6	0,34	0,50	870	60	11,7	5,3
2 1/2	65 + 2	0,11	2,7	0,46	0,69	750	52	14,3	6,5
3	76 + 2	0,12	3,1	0,64	0,95	720	50	20,1	9,1
3 1/2	90 + 2,5	0,13	3,3	0,79	1,18	640	44	22,3	10,1
4	102 + 2,5	0,13	3,2	0,80	1,20	610	42	25,1	11,4
4 1/2	114 + 3	0,13	3,2	0,96	1,43	510	35	27,6	12,5
5	127 + 4	0,13	3,4	1,13	1,68	440	30	30,2	13,7
6	151 + 4	0,15	3,8	1,41	2,10	610	42	37,5	17,0



DRAG LINE

DRAGMAN

Mandals Dragman is especially designed to withstand the extreme tensile stress, pulling forces and abrasion from umbilical slurry systems.

Some diameters are available in 300-400 meter lengths.



FEATURES

- Designed for umbilical drag system used for distribution of slurry and manure in agricultural fields
- Engineered with extreme tensile strength and abrasion properties
- High tenacity filament polyester yarn

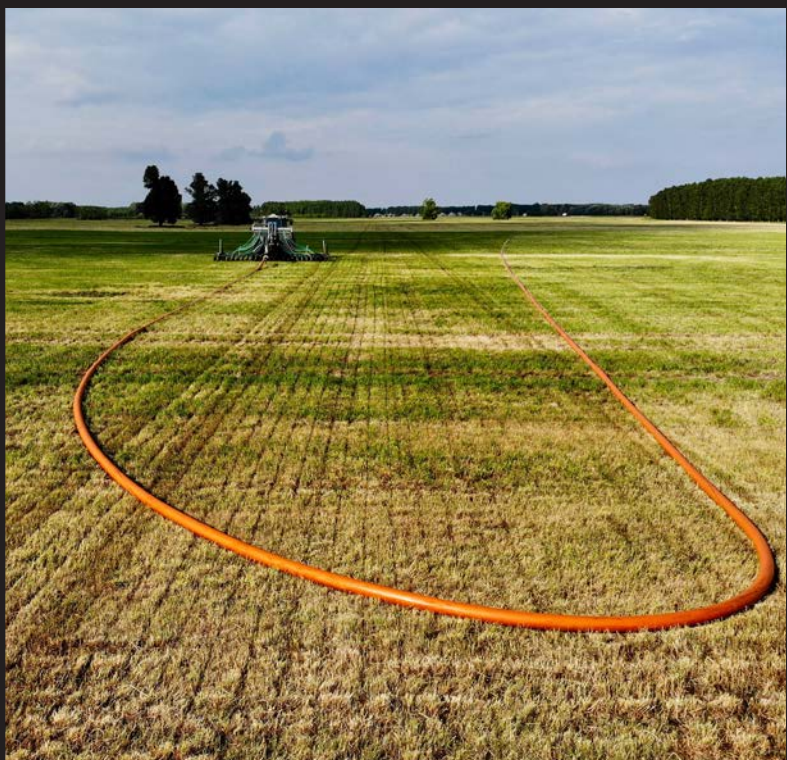
ADVANTAGE

- High tensile strength
- Enhanced abrasion resistance
- Diameter and extension stability
- Low kink radius
- High puncture resistance
- Temperature range -50 to 75 ° C (pure water)
- Some diameters are available in longer length than standard 200 mts.
- Excellent UV and weathering resistance

DESIGN

- Thermoplastic polyether based polyurethane (TPU)
- Extruded through a circular woven jacket
- Heavily reinforced weave





TECHNICAL DATA - DRAGMAN STANDARD

INNER DIAMETER		WALL THICKNESS		WEIGHT		BURST PRESSURE		TENSILE STRENGTH	
Inch	mm	Inch	mm	Lbs / ft	Kg / m	Psi	Bar	X1000 kbs	Tons
3 1/2	90 + 2	0,14	3,5	0,70	1,05	630	44	30,2	13,7
4	102 + 2,5	0,14	3,6	0,91	1,35	600	42	34,4	15,6
4 1/2	114 + 2,5	0,14	3,6	1,01	1,50	520	36	39,5	17,9
5	127 + 2,5	0,14	3,6	1,11	1,65	460	32	43,9	19,9
5 1/2	140 + 3	0,15	3,7	1,29	1,92	400	28	45,9	20,8
6	152 + 3	0,15	3,8	1,34	2,00	400	28	58,9	26,7
8	203 + 3	0,16	4,1	2,21	3,30	430	30	107,4	48,7

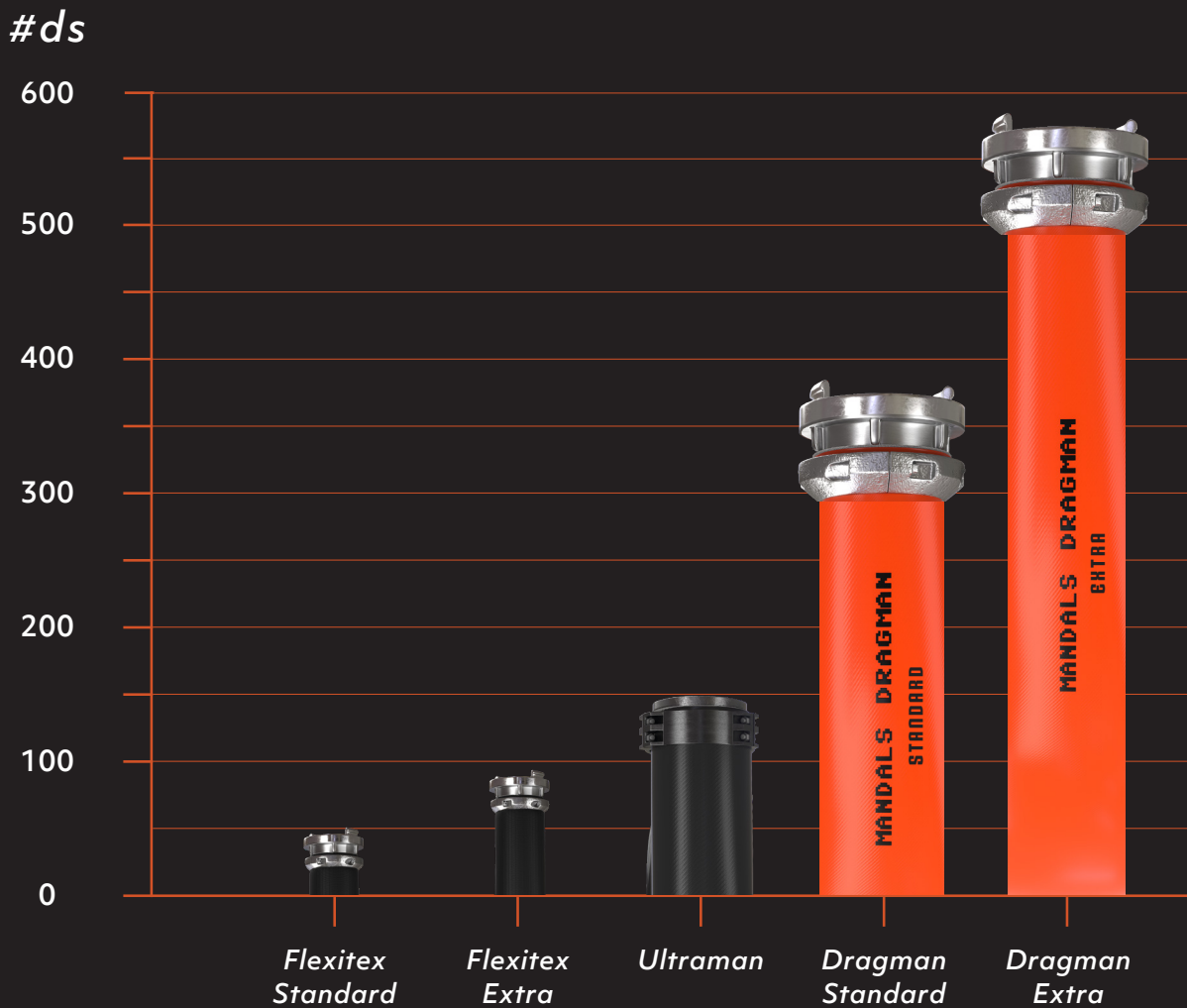
TECHNICAL DATA - DRAGMAN EXTRA

INNER DIAMETER		WALL THICKNESS		WEIGHT		BURST PRESSURE		TENSILE STRENGTH	
Inch	mm	Inch	mm	Lbs / ft	Kg / m	Psi	Bar	X1000 kbs	Tons
4	102 + 2,5	0,17	4,3	1,07	1,60	530	37	39,5	17,9
4 1/2	114 + 2,5	0,17	4,3	1,16	1,73	440	31	43,9	19,9
5	127 + 2,5	0,17	4,3	1,24	1,85	430	30	48,3	21,9
5 1/2	140 + 3	0,17	4,3	1,41	2,10	420	29	58,9	26,7
6	152 + 3	0,17	4,4	1,54	2,30	430	30	63,1	28,6

TECHNICAL DATA - DRAGMAN PREMIUM

INNER DIAMETER		WALL THICKNESS		WEIGHT		BURST PRESSURE		TENSILE STRENGTH	
Inch	mm	Inch	mm	Lbs / ft	Kg / m	Psi	Bar	X1000 kbs	Tons
4	102 + 2,5	0,17	4,3	1,07	1,60	520	36	31,1	14,1
4 1/2	114 + 2,5	0,17	4,2	1,14	1,70	530	37	31,1	14,1
5	127 + 2,5	0,17	4,3	1,26	1,88	430	30	34,4	15,6

ABRASIVE RESISTANCE



Abrasion tests are performed with an abrasive cloth that is dragged back and forth over the hose counter as the number of double strokes (**#ds**). A flow of air prevents build-up of particles between the cloth and the hose. The number of double strokes are counted until the first yarn is exposed

Mandals perform the measurement at the thinnest area of the hose, and have added extra load to the test arm compared to the BS-6391 standard in order to be able to do the measurement within a reasonable time.

Actual #ds is a function of layer thickness of thermoplastic or rubber. Measurements are performed at the thinnest area of the hose. A thickness difference of only 0.1 mm generate a large difference in #d.s.

ABRASION TEST



DRAG HOSE VS SLURRY TANK

- **NO SOIL COMPRESSION**
- **LIGHTER EQUIPMENT**
- **MANURE SPREADING ALSO POSSIBLE WHEN SOIL IS SOFT OR WET**
- **IMMEDIATE VOLUME - NO DOWN TIME**
- **CONTINUOUS FLOW - NO REFILL**
- **FLEXIBLE SUPPLY LINE FROM LAGOON / PIT**
- **NO OCCUPANCY OF SURROUNDINGS (PUBLIC ROADS)**
- **FLEXIBLE HOSE DIMENSIONS AVAILABLE**
- **EASY DEPLOYMENT AND RETRIEVAL**



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WORLD CLASS LAY-FLAT HOSES


Mandals is a Norwegian company dedicated to designing and manufacturing the best lay-flat hoses on the market.

Our Premium Lay-flat hoses have been designed to operate in high demanding industries, which require precision in their applications so that they can deliver effective results and ensure the profitability of our clients' investments.


INDUSTRIES



AGRICULTURE



ENERGY



PIPE REHABILITATION




FIRE FIGHTING



POTABLE WATER




MINING



CONSTRUCTION



COMPRESSED AIR



DE-WATERING

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