

StirLNG-1 Cryogenerator

Liquefier for nano scale LNG conditioning

Stirling Technology

For over seventy years Stirling Cryogenics has been designing and manufacturing gas liquefaction systems, serving customers all over the world under all possible conditions. This experience is incorporated in our Methane liquefiers called StirLNG.

They have three specific fields of application:

- Nano scale production of LNG from a purified gas source such as pipeline or biogas.
- Re-liquefaction of boil off gas to minimize losses in a cryogenic (storage) system (fuel stations, storage tanks, etc.).
- Re-liquefaction of boil-off gas on vessels.

The cooling power of the StirLNG is created by the so called reversed Stirling cycle: compression and expansion of helium gas in a closed cycle by mechanical pistons. The Methane to be liquefied has no contact with the working of the Stirling Cycle, maintaining a contamination-free flow. The process gas flows through the cold head here thermal energy is extracted, causing the gas to liquefy. The gas only encounters a phase change, and there is no pressure difference between the gas inlet and the liquid outlet.

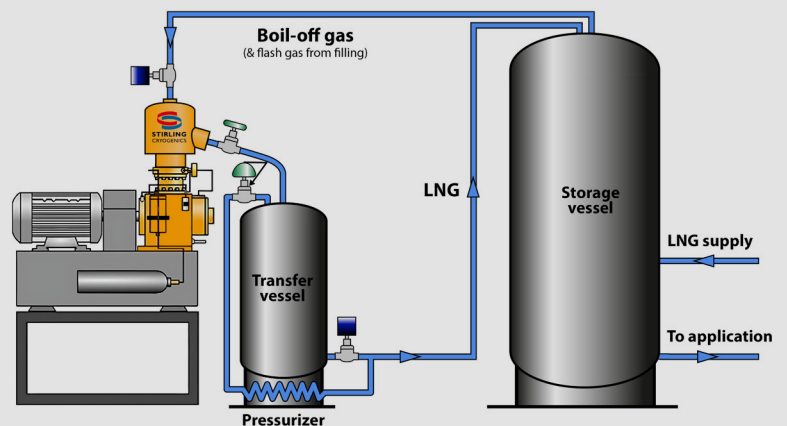


LNG Conditioning with StirLNG-1

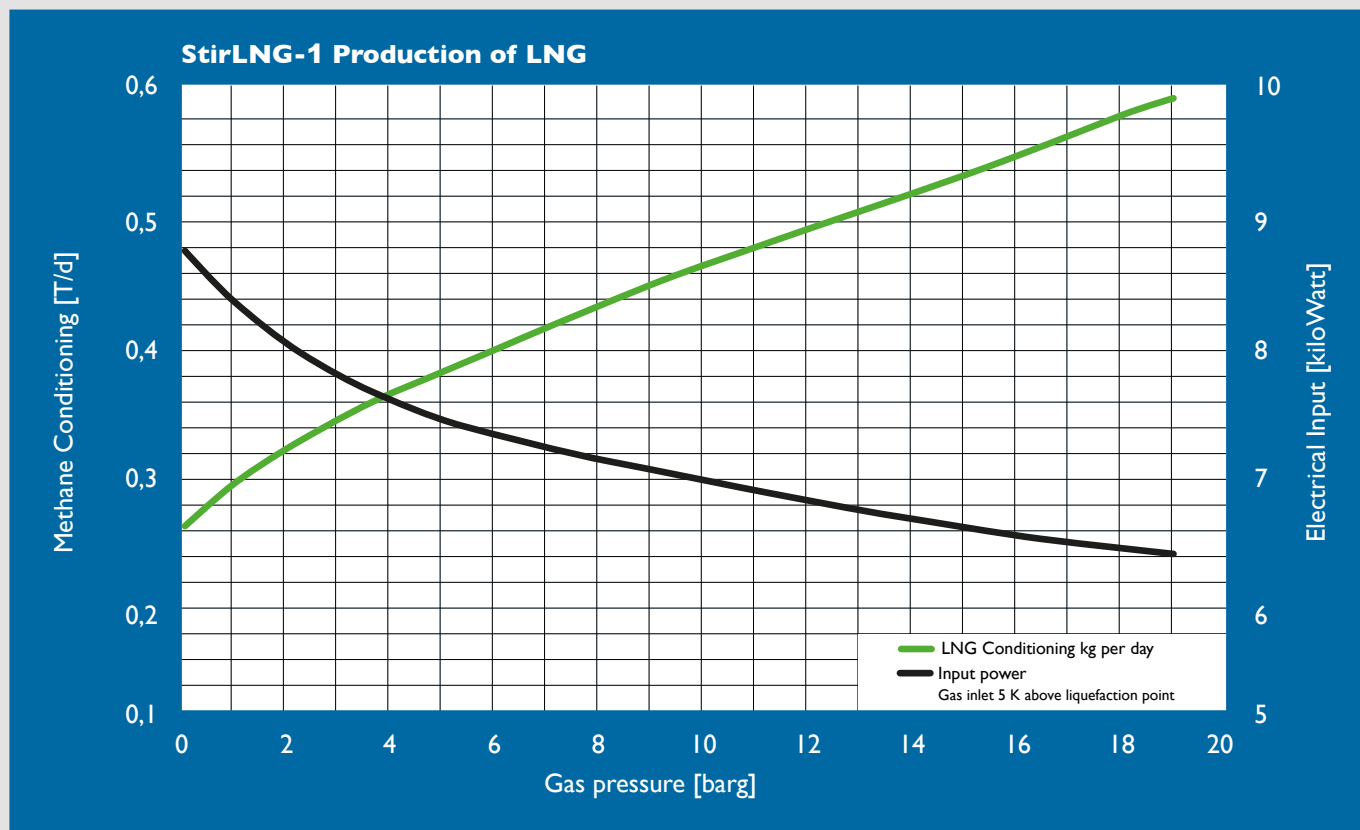
The StirLNG-1 is our SPC-1 Cryogenerator specifically modified for nano scale LNG production, conditioning and re-liquefaction. Depending on the gas pressure, the StirLNG-1 can re-liquefy 450 kg/day of LNG (340 gal/day).

The Stirling Cryogenerator operates with automatic controls and is driven by an electric motor. Boil-off gas is extracted from a storage tank, re-liquefied by the StirLNG Cryogenerator, and returned to the storage tank.

Alternatively, LNG can be extracted from the bottom of the storage tank, sub-cooled and sprayed into the tank, thus reducing the overall pressure of the system and eliminating boil off gas.



StirLNG-1 Specifications



Barg	K	PPM	W	kW	Nm ³ /hr	kg/hr	l/hr	T/day	Gal/day
0	111	66	1550	8,9	14,9	10,7	25,4	0,26	161
2	126	230	1820	8,1	18,7	13,4	33,5	0,32	213
4	135	486	1980	7,7	21,2	15,2	39,4	0,36	250
6	141	800	2080	7,4	23,1	16,6	44,4	0,40	282
8	146	1213	2170	7,2	25,0	18,0	49,3	0,43	313
10	151	1837	2250	7,0	26,8	19,2	54,1	0,46	343
12	155	2562	2315	6,9	28,5	20,5	58,9	0,49	374
14	158	3287	2360	6,7	30,2	21,6	63,7	0,52	404
16	161	4217	2410	6,6	31,9	22,9	68,9	0,55	437
18	164	5412	2460	6,5	33,7	24,2	74,4	0,58	472
20	167	6944	2505	6,4	35,5	25,4	79,9	0,61	507

Specifications	
Explosion proof classification	ATEX Zone 2 or I Nec 500, Class I Div 2 or I, gas group D Other, upon request
Max. gas pressure	20 barg 290 psig
Water consumption (incl. 20% EG)	750 l/hr @ 15°C
System size (l x w x h)	1,10 m 0,80 m 1,20 m

Feed gas composition limits Deviations from pure methane will affect capacity above.	Main stream: CH ₄ CxHy (C2 to C4) 10% CxHy (C5+) < 1 ppm H ₂ O < -70°C dew point H ₂ S < 3,3 ppm Oil content < 0,01 mg/m ³ Particles < 0,1 micron N ₂ /O ₂ < 10% ⁽²⁾
<small>1: Solubility of CO₂ as function of liquid temperature. Pressure for indication only, relative to pure methane. Other components such as N₂ will lower the liquid temperature relative to the saturated pressure, decreasing the allowable CO₂ level. 2: The actual re-liquefaction capacity might be lower, based on the composition of the boil off gas. Especially N₂ and O₂ will lower the re-liquefaction temperature and therefore will reduce the available cooling power and liquefaction capacity.</small>	

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