



The following information presents LifeGuard Technologies recommended hose life cycles:

	General case, except C2H2	Example 1: Cylinder with a Working Pressure of 200bar at 15°C	Example 2: Cylinder with a Working Pressure of 300bar at 15°C	Example 3: Cylinder with a Working Pressure of 700bar at 15°C	C2H2
<b>Maximum Allowable Working Pressure</b>	MAWP	250	375	875	25
<b>Proof Pressure (minimum)</b>	1.5 * MAWP	375	560	1050	300 (fixed value)
<b>Bursting pressure (minimum)</b>	4 * MAWP if MAWP <= 450bar *  2.5 * MAWP if MAWP > 450bar with a minimum of 1500 bar	1000	1500	2190	1000 (fixed value)

## 1. TYPES OF HOSES

Depending upon the use or applications, the hoses must satisfy different requirements.

Specific considerations may have to be given according to the following type of hoses:

- Hose at customer site,
  - Hose at filling center,
- as well as
- Hose for breathable or medical gases,
  - Hose for industrial oxygen, air or gas mixture with a partial pressure of oxygen exceeding 30barg
- ... equipped with
- straight or an elbowed end sub-assemblies.

### 1.1.1. LIFESPAN

The service life is limited to take into account the aging of the inside tube, with a safety factor of 5.

Also, to safeguard service life span, it is important to maintain and operate the flexible hose carefully. Flexible hoses are sensitive to tensile and compression forces, bending (especially under pressure), repeated pressurization cycles, vibrations, twisting (flexible hoses' weak point), and are subject to gasket and thread wear-out.

Hose assemblies at customer sites are generally more often under pressure than those at filling centers. By contrast, in filling centers they are more often subjected to pressure/zero pressure cycles. Also, hoses at customer sites are seldom or never inspected during use, whereas at filling centers inspection is mandatory.

Consequently, the following life spans have been established.

A hose assembly shall be destroyed (e.g. cut or perforated) when it is removed from service to prevent reuse.

#### 1.1.1.1 Customer site hose assemblies

There shall be a procedure for checking the suitability of the hose assembly for the intended service. Hoses in poor condition shall be removed from service and destroyed.

	Metallic Hose	Plastic Hose
Maximum pressurization cycles <sup>1</sup>	1,000	1,000
Maximum service life (years)	5	5

Table 5: Customer hose assemblies

#### 1.1.1.2 Filling center hose assemblies

	Metallic Hose	Plastic Hose
Maximum pressurization cycles	Value defined with a safety factor of 5 and reduced if the hose fails 1 of the 2 cycle tests. <sup>2</sup>  Lifespan is proportional to performance, as shown below	10,000

<sup>1</sup> The number of pressurization cycles at customer site is estimated according to cylinder rotation. Service life shall be reduced if 1,000 cycles may be exceeded.

<sup>2</sup> This rule does not apply to specific flexible hoses qualified without a minimum number of successful hydraulic pressure cycles (e.g. with specific consideration or material). See section **Error! Reference source not found.** (Hydraulic pressure cycling test).

	Metallic Hose	Plastic Hose																				
	<p>(see notes on Range of successful test cycles<sup>3</sup> and Maximum pressurization cycles<sup>4</sup>)</p> <table border="1"> <thead> <tr> <th>Range of successful test cycles</th> <th>Maximum pressurization cycles</th> </tr> </thead> <tbody> <tr> <td>50000</td> <td>10000</td> </tr> <tr> <td>45000 - 49999</td> <td>9000</td> </tr> <tr> <td>40000 - 44999</td> <td>8000</td> </tr> <tr> <td>35000 - 39999</td> <td>7000</td> </tr> <tr> <td>30000 - 34999</td> <td>6000</td> </tr> <tr> <td>25000 - 29999</td> <td>5000</td> </tr> <tr> <td>20000 - 24999</td> <td>4000</td> </tr> <tr> <td>15000 - 19999</td> <td>3000</td> </tr> <tr> <td>10000 - 14999</td> <td>2000</td> </tr> </tbody> </table>	Range of successful test cycles	Maximum pressurization cycles	50000	10000	45000 - 49999	9000	40000 - 44999	8000	35000 - 39999	7000	30000 - 34999	6000	25000 - 29999	5000	20000 - 24999	4000	15000 - 19999	3000	10000 - 14999	2000	
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<sup>3</sup> Successful test cycles: The lesser of the average number of hydraulic test cycles and U-bend test cycles passed.

<sup>4</sup> Maximum pressurization cycles: The number of cycles can be estimated based on the daily filling cycles. For example, a filling rack equipped with flexible hoses rated for 5,000 pressurization cycles maximum and used to fill 6 times a day, 250 days a year requires flexible hose maintenance every 40 months (3.3 years;  $3.3 = 5000/6/250$ ).