

Sheet1

M Diameter of Balloon	5.00	5.00	10.00	10.00
M Radius of Balloon	2.50	2.50	5.00	5.00
M Height Of Balloon	50.00	100.00	50.00	100.00
Pi	3.14	3.14	3.14	3.14
M <sup>2</sup> Surface Area Of Balloon	824.67	1610.06	1727.87	3298.67
M <sup>3</sup> Volume of Balloon	981.75	1963.49	3926.99	7853.98
Kg Mass of square M of 120mu Mylar	0.11	0.11	0.11	0.11
Kg of H2 per cubic meter NTP	0.09	0.09	0.09	0.09
Kg of He per cubic meter NTP	0.18	0.18	0.18	0.18
Kg Mass of H2 to fill Balloon	88.26	176.52	353.04	706.07
Kg Mass of He to fill 3 Balloons	526.31	1052.63	2105.26	4210.52
Kg of 1 cubic M of Air at STP	1.29	1.29	1.29	1.29
Kg Lifting of 1 Cubic M of H2 at STP	1.20	1.20	1.20	1.20
Kg Lifting of 1 Cubic M of He at STP	1.11	1.11	1.11	1.11
Kg Lifting 1 H2 Balloon STP	1180.06	2360.12	4720.24	9440.48
Kg Lifting 3 He Balloons STP	3281.00	6562.00	13123.99	26247.98
Kg Total Lift	4461.06	8922.12	17844.23	35688.46
Kg of HTP & H2 Engine	110.00	110.00	110.00	110.00
Kg of HTP fuel tanks & Pipework	50.00	50.00	50.00	50.00
Kg of Electronics	5.00	5.00	5.00	5.00
Kg of Payload if any	0.00	0.00	0.00	0.00
Kg of planned HTP	3942.44	8066.72	16938.32	34108.99
Kg of 1 Mylar 120mu Balloon	88.40	172.60	185.23	353.62
Kg of 4 Mylar 120mu Balloons	353.62	690.40	740.91	1414.47
£ Cost of H2 per KG	6.00	6.00	6.00	6.00
£ Cost of He per KG	52.00	52.00	52.00	52.00
£ Cost of 85% HTP per KG	5.87	5.87	5.87	5.87
£ Cost of 120mu Mylar per M <sup>2</sup>	1.17	1.17	1.17	1.17
£ Cost of 1 Mylar 120mu Balloon	964.86	1883.78	2021.61	3859.44
£ Cost of 4 Mylar 120mu Balloons	3859.44	7535.10	8086.45	15437.77
£ Cost of H2 to fill 1 Balloon	529.55	1059.11	2118.22	4236.43
£ Cost of He to fill 3 Balloons	27368.35	54736.71	109473.42	218946.83
£ Cost of planned HTP	23142.13	47351.65	99427.93	200219.79
£ Cost of HTP & H2 engine	5000.00	5000.00	5000.00	5000.00
£ Cost of HTP fuel tanks & pipework	1000.00	1000.00	1000.00	1000.00
£ Cost of electronics	5000.00	5000.00	5000.00	5000.00
Approx Total Dry Mass of prototype	518.62	855.40	905.91	1579.47
Approx Total Mass of prototype + He	1044.93	1908.02	3011.17	5789.99
Approx Total Mass of prototype +He +H2	1133.19	2084.54	3364.21	6496.06
H2 Fuel Mass/Energy equivalent when LTA	865.82	1731.64	3463.28	6926.57
HTP Fuel Mass equivalent when LTA	38675.34	79134.52	166164.91	334609.22
Fuel Mass equivalent when LTA	39541.16	80866.16	169628.19	341535.79
Approx Total Mass of prototype +He +H2 +HTP	<b>5075.63</b>	<b>10151.26</b>	<b>20302.53</b>	<b>40605.05</b>
Approx Total Cost of prototype	<b>£66,864.34</b>	<b>£123,566.34</b>	<b>£232,127.63</b>	<b>£453,700.27</b>
Dry Mass + He to fuel equivalent Ratio	<b>38</b>	<b>42</b>	<b>56</b>	<b>59</b>

Note 110Kg HTP engine can give 4309Kg Thrust

42271.29 Newtons

Sheet1

85% HTP Water to Oxygen ratio after catalyst 60:40

Planned HTP would produce Kg of O2	1576.98	3226.69	6775.33	13643.60
Planned HTP O2 would burn Kg of H2	197.12	403.34	846.92	1705.45
O2 left over	108.86	226.82	493.88	999.38