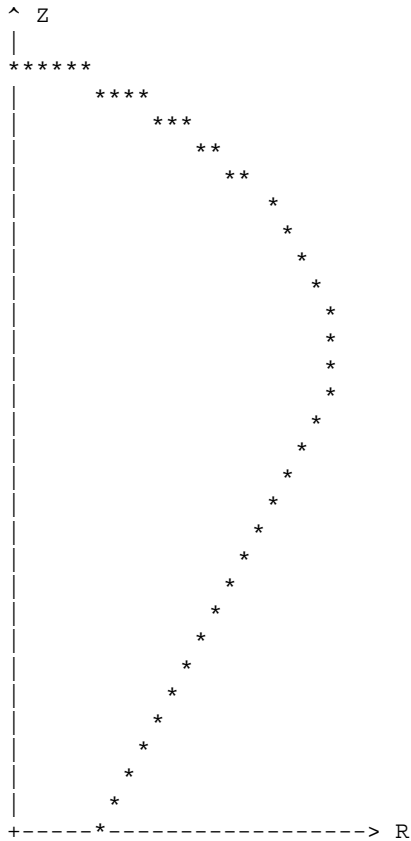


Begin of file for a 250.00 m3 / 8828.65 cu.ft balloon  
Version 2.7.253 du 10 septembre 2001

\*\*\*\*\* Calculation of the slices of a balloon \*\*\*\*\*

The balloon is divided in 93 horizontal slices (first column)  
This slices are used for the calculation of the panels.



Z (m) : height of the slice, with Z=0 at the mouth of the balloon  
R (m) : radius of the slice  
S (m) : curvilinear abscissa, with S=0 at the top of the balloon (centre of the crown ring)  
A (m) : angle between the slice and the vertical. Value is 90 deg for the first slice (generally)  
Tp (m2) : area of the slice  
Tt (m2) : total area of the elements Tp. Tt[93] gives the area of the whole balloon without taking account of the oversizing for the parachute, the margin to sew, but including Nomex ...  
Asked balloon volume : 8828.65 cu.ft or 250.00 m3

Table of the balloon shape (Deramecourt type)

----- Top ellipse -----						
	Z	R	S	A	Tp	Tt
	m	m	m	deg	m2	m2
0	7.911	0.000	0.000	90.000	0.000	0.000
1	7.910	0.108	0.108	88.854	0.037	0.037
2	7.906	0.216	0.216	87.706	0.110	0.146
3	7.901	0.323	0.324	86.555	0.183	0.329
4	7.893	0.431	0.432	85.400	0.256	0.585
5	7.884	0.539	0.540	84.238	0.330	0.916
6	7.872	0.647	0.649	83.069	0.404	1.320
7	7.857	0.755	0.757	81.890	0.479	1.799
8	7.841	0.863	0.866	80.699	0.554	2.353
9	7.822	0.970	0.976	79.496	0.630	2.984
10	7.801	1.078	1.086	78.277	0.707	3.691
11	7.777	1.186	1.196	77.041	0.785	4.476
12	7.751	1.294	1.307	75.785	0.864	5.341
13	7.723	1.402	1.419	74.507	0.945	6.285
14	7.691	1.510	1.531	73.205	1.027	7.312
15	7.658	1.617	1.644	71.875	1.111	8.423
16	7.621	1.725	1.758	70.515	1.196	9.619
17	7.581	1.833	1.873	69.121	1.284	10.903
18	7.539	1.941	1.989	67.688	1.375	12.278
19	7.493	2.049	2.106	66.214	1.469	13.747
20	7.443	2.157	2.224	64.692	1.566	15.313
21	7.391	2.264	2.345	63.118	1.668	16.981
22	7.334	2.372	2.466	61.484	1.774	18.755
23	7.273	2.480	2.590	59.783	1.886	20.641
24	7.208	2.588	2.716	58.007	2.005	22.647
25	7.138	2.696	2.844	56.145	2.132	24.779
26	7.063	2.804	2.976	54.186	2.270	27.049
27	6.983	2.911	3.111	52.113	2.419	29.468
28	6.895	3.019	3.249	49.908	2.585	32.053
29	6.801	3.127	3.393	47.547	2.770	34.823
30	6.698	3.235	3.542	45.000	2.982	37.805
----- Middle ellipse -----						
30	6.698	3.235	3.542	45.000	2.982	37.805
31	6.605	3.323	3.670	42.026	2.641	40.446
32	6.512	3.403	3.793	39.213	2.588	43.034
33	6.419	3.475	3.910	36.533	2.545	45.579
34	6.326	3.541	4.024	33.965	2.509	48.089
35	6.233	3.601	4.135	31.492	2.480	50.568
36	6.140	3.655	4.242	29.102	2.454	53.023
37	6.047	3.704	4.348	26.782	2.433	55.456
38	5.954	3.749	4.451	24.523	2.415	57.871
39	5.861	3.789	4.552	22.318	2.399	60.270
40	5.768	3.825	4.652	20.158	2.386	62.656
41	5.675	3.858	4.750	18.039	2.375	65.031
42	5.582	3.886	4.847	15.954	2.365	67.396
43	5.489	3.911	4.944	13.899	2.357	69.753
44	5.396	3.932	5.039	11.869	2.350	72.103
45	5.303	3.950	5.134	9.860	2.344	74.447
46	5.210	3.964	5.228	7.868	2.340	76.787
47	5.117	3.976	5.321	5.889	2.336	79.123
48	5.024	3.984	5.415	3.921	2.333	81.456
49	4.931	3.988	5.508	1.959	2.332	83.787
50	4.838	3.990	5.601	0.000	2.331	86.118
----- Cosine part -----						
50	4.838	3.990	5.601	0.000	2.331	86.118
51	4.719	3.988	5.721	-2.025	3.000	89.118
52	4.599	3.981	5.840	-4.041	3.001	92.119
53	4.479	3.971	5.961	-6.041	3.002	95.122
54	4.359	3.956	6.081	-8.018	3.004	98.125
55	4.240	3.937	6.202	-9.963	3.005	101.130

56	4.120	3.914	6.324	-11.870	3.007	104.137
57	4.000	3.887	6.447	-13.734	3.008	107.146
58	3.881	3.856	6.571	-15.549	3.009	110.155
59	3.761	3.820	6.696	-17.309	3.009	113.164
60	3.641	3.781	6.822	-19.012	3.008	116.173
61	3.522	3.738	6.949	-20.655	3.006	119.179
62	3.402	3.691	7.077	-22.233	3.001	122.180
63	3.282	3.640	7.207	-23.747	2.995	125.175
64	3.162	3.585	7.339	-25.195	2.985	128.160
65	3.043	3.527	7.472	-26.576	2.973	131.134
66	2.923	3.466	7.607	-27.890	2.958	134.091
67	2.803	3.401	7.743	-29.137	2.939	137.030
68	2.684	3.332	7.881	-30.318	2.916	139.946
69	2.564	3.261	8.020	-31.433	2.889	142.835
70	2.444	3.186	8.161	-32.484	2.858	145.692
71	2.325	3.108	8.304	-33.472	2.822	148.514
72	2.205	3.028	8.448	-34.398	2.781	151.296
73	2.085	2.944	8.594	-35.264	2.736	154.032
74	1.965	2.859	8.741	-36.071	2.686	156.718
75	1.846	2.770	8.890	-36.821	2.631	159.350
76	1.726	2.679	9.041	-37.514	2.572	161.922
77	1.606	2.586	9.192	-38.153	2.507	164.429
78	1.487	2.491	9.345	-38.739	2.438	166.867
79	1.367	2.394	9.499	-39.273	2.364	169.232
80	1.247	2.296	9.654	-39.756	2.286	171.518
81	1.128	2.195	9.810	-40.189	2.204	173.722
82	1.008	2.093	9.968	-40.575	2.117	175.839
83	0.888	1.990	10.126	-40.912	2.027	177.866
84	0.768	1.886	10.284	-41.203	1.933	179.800
85	0.649	1.781	10.444	-41.448	1.836	181.636
86	0.529	1.675	10.604	-41.647	1.736	183.372
87	0.409	1.568	10.764	-41.802	1.634	185.006
88	0.290	1.461	10.925	-41.912	1.529	186.535
89	0.170	1.353	11.086	-41.978	1.423	187.958
90	0.050	1.245	11.247	-42.000	1.315	189.272
----- Bottom cone -----						
90	0.050	1.245	11.247	-42.000	1.315	189.272
91	0.034	1.230	11.269	-42.000	0.175	189.448
92	0.017	1.215	11.292	-42.000	0.173	189.621
93	0.000	1.200	11.314	-42.000	0.171	189.792

\*\*\*\*\* Summary of informations \*\*\*\*\*

USER INPUTS

Asked volume : 8828.65 cu.ft or 250.00 m3 with 16 gores  
Mouth radius : 1.200 m  
Parachute radius : 0.600 m  
Width of fabric : 1.500 m  
Width of Nomex : 1.500 m  
Margin for sewing : 12 mm  
Shape asked : (D) (D)eramecourt shape  
Panel(s) of max size : 0, with height equal to width of fabric  
Load : 130.0 Kg (at the bottom of the balloon, vertically)

SECONDARY INPUTS

BURNER FRAME

Width of frame : 0.500 m  
Length of frame : 0.500 m  
Ang. bet. cabl. & vert: 44.0 degrees

WEIGHTS

Weight of fabric : 38.0 g/m2  
Weight of Nomex : 38.0 g/m2  
Weight of load tape : 20.0 g/ml  
Weight of mouth tape : 20.0 g/ml  
Weight of centr. cord.: 10.0 g/ml  
Weight of tract. cord.: 10.0 g/ml  
Weight of para. line : 10.0 g/ml  
Weight of crown line : 10.0 g/ml  
Weight of cable : 30.0 g/ml  
Weight of crimping : 0.0 g  
Weight of a carabiner : 50.0 g  
Weight of a crown ring: 30.0 g  
Weight of a pulley : 0.0 g  
Weight of 1000m thread: 80.0 g/1000m

PRICES

Price of fabric : 2.00 /m2  
Price of Nomex : 2.00 /m2  
Price of load tape : 1.00 /ml  
Price of mouth tape : 1.00 /ml  
Price of centr. cord. : 0.00 /ml  
Price of tract. cord. : 0.00 /ml  
Price of para. line : 0.00 /ml  
Price of crown line : 1.50 /ml  
Price of cable : 1.50 /ml  
Price of one crimping : 0.00  
Price of a carabiner : 5.00  
Price of a crown ring : 10.00  
Price of a pulley : 0.00  
Price of 1000m thread : 25.00

FIXED INPUTS

Overlap of parachute : 0.400 m on the radius

OUTPUTS

Max radius : 3.990 m  
Height of the top : 7.911 m  
Length of a gore : 11.314 m from center of parachute to the mouth  
Length of a gore \* : 9.237 m from border of parachute to top of Nomex  
Area : 189.79 m2 (including Nomex panels and parachute but without overlap of parachute)  
Number of panels : 8  
Panels : 1 (nomex) and 6 with convexity and a half panel at the top  
Nomex panel : 1.500 (1.476 without margins)  
6 panels : 1.444 (1.420 without margins) and for which you have to add convexities  
a half panel at top : 0.750 (0.726 without margins)

For the words 'min fabric quantity' and 'max fabric quantity', please refer to the part about panels

Min fabric quantity : 123.04 ml (181.61 m2) - without the parachute  
Max fabric quantity : 138.28 ml (204.11 m2) - without the parachute  
Parachute fabric : 2.51 ml (3.14 m2) quantity in 'ml' includes +20 percents for the cutting  
Fabric to buy : 133.18 ml (199.77 m2)  
Nomex for bottom panel: 11.19 ml  
Nomex for scoop : 3.38 m2 (area of a half cone which base is the mouth of the balloon)  
Nomex for scoop : 2.70 ml (including 20 percents more for the cutting)  
Nomex to buy : 13.89 ml (scoop + first panel)

Length to sew : 346 ml  
Thread to buy : 2079 ml  
Traction cord : 32.7 ml about (polyester or kevlar)  
Centring cord : 4.8 ml about (polyester or kevlar)  
Z Centring cord : 0.00 m below the top of the parachute  
Command line : 18.2 (23.4) ml about without (with) a return pulley  
Crown line : 12.8  
Length of each tape : 12.31 ml (which 1.00 ml are used to attach crown ring and bottom cables)  
Vertical tape (1): 197.03 ml  
Horizontal tape (1): 74.90 ml  
Tape for loops (1): 16.00 ml (loops to tie the centering and traction cord.)  
Wide tape (mouth) (2): 7.54 ml  
Tape to buy (1): 287.93 ml  
Tape to buy (2): 7.54 ml  
Cable to buy : 23.21 ml (included 10 cm per crimping)  
Number of crimp (?) : 24  
Number of XXXCOMPLETER: 24  
Thermoretractable tube: 1.20 ml (5cm per crimping)

WEIGHTS CALCULATION

Weight of fabric : 6.651 kg (including the overlap of the parachute)  
Weight of Nomex : 0.766 kg  
Weight of tapes (1) : 5.759 kg  
Weight of tapes (2) : 0.151 kg  
Weight of tract. cord : 0.327 kg  
Weight of centr. cord : 0.048 kg  
Weight of command line: 0.182 (0.234) kg about without (with) a return pulley  
Weight of crown line : 0.128  
Weight of cables : 0.696 kg  
Weight of crimpings : 0.000 kg (24 crimpings)  
Weight of 4 carabiners: 0.200 kg  
Weight of crown ring : 0.030 kg  
Weight of 2 pulleys : 0.000 kg (without a return pulley, elsewhere, add a pulley)  
Weight of the thread : 0.166 kg  
Total weight : 15.104 kg (taken without return pulley)

PRICES CALCULATION (without unit)

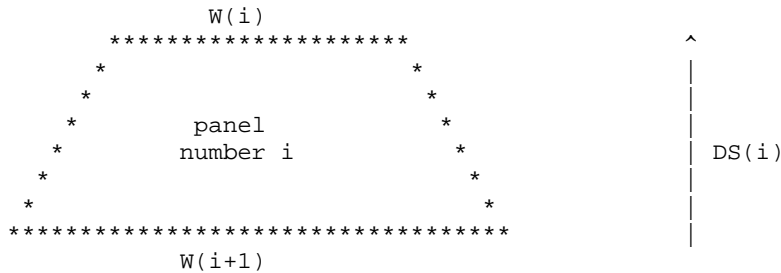
Price of fabric : 350.05 (including the overlap of the parachute)  
Price of Nomex : 40.32  
Price of tapes (1) : 287.93  
Price of tapes (2) : 7.54  
Price of tract. cord : 0.00  
Price of centr. cord : 0.00  
Price of command line : 0.00 (0.00) about without (with) a return pulley  
Price of crown line : 19.22  
Price of cables : 34.81  
Price of crimpings : 0.00  
Price for 4 carabiners: 20.00  
Price for crown ring : 10.00  
Price for 2 pulleys : 0.00 (without a return pulley, elsewhere, add a pulley)  
Price for thread : 51.96  
Total Price : 821.84 (taken without return pulley)

\*\*\*\*\* Datum about panels (without margins) \*\*\*

S : curvilinear abscissa along the gore, beginning at the center of the parachute  
 Z : z (vertical coordinate), with z=0 at the mouth  
 R : radius of the balloon  
 W : width of the panel  
 W/2 : half-width of the panel (needed to make the patterns)  
 DS : height at the center of the panel  
 DE, TE : no utility for the user for now. Used to compute the convexities  
 to add on the top and at the bottom of the panels  
 ML (O/P) : length (in linear meters) for all of the panels of a given index  
 only the values for sewn panels are given  
 O : optimal, all the panels are cutted head to foot in the same roll  
 wastes of fabric are the lowest  
 P : the worst, all the panels are cutted in the same way, without  
 turnaround. Wastes of fabric are the highest

Calculus give trapezoids. In truth, the panels have their top and bottom sides slightly curved towards outside.  
 THE VALUES GIVEN IN THE TABLES DO NOT INCLUDE THE POSSIBLE CONVEXITIES (but the dxf files do include these convexities)  
 But left and right sides of the panels are straight.  
 The value of the convexity to add at the top/bottom of the panels is given below.

All sizes are given in metric system (sizes given without margin for sewing, so these are sizes of sewn panel as you can watch it on a balloon).  
 sh indicates an horizontal tape (without the overlap margin)  
 sb indicates the mouth tape (without the overlap margin)



[SECTION PANNEAUX SANS MARGES]

	S	Z	R	W	W/2	DS	DE	DE-DS	TE	ML(O/P)
	0.601	7.877	0.600	0.236	0.118	( 0 ) sh 3.77 ml				
A)	1.315	7.749	1.302	0.511	0.256	( 1 )	0.714	0.727	0.013	0.013 3.2/ 4.3
B)	2.736	7.197	2.605	1.023	0.511	( 2 )	1.420	1.443	0.023	0.036 12.7/ 16.8
C)	4.156	6.214	3.612	1.418	0.709	( 3 ) sh 22.69 ml	1.420	1.434	0.014	0.050 19.9/ 23.1
D)	5.577	4.862	3.990	1.567	0.783	( 4 ) sh 25.07 ml	1.420	1.422	0.002	0.052 24.3/ 25.5
E)	6.997	3.476	3.720	1.461	0.730	( 5 ) sh 23.37 ml	1.420	1.421	0.001	0.053 24.6/ 25.5
F)	8.418	2.230	3.045	1.196	0.598	( 6 )	1.420	1.427	0.006	0.059 21.6/ 23.8
G)	9.838	1.106	2.177	0.855	0.427	( 7 )	1.420	1.431	0.010	0.069 16.8/ 19.5
H) - Nomex -	11.314	0.000	1.200	0.471	0.236	( 8 ) sb 7.54 ml	1.476	1.488	0.012	0.081 11.2/ 14.1

[FIN SECTION PANNEAUX SANS MARGES]

\*\*\*\*\* Datum about panels (WITH margins) \*\*\*\*\*

All sizes are given in metric system (sizes given with margin for sewing, so sizes of panels before sewing).

sh indicates an horizontal tape (including an overlap for sewing)

sb indicates the mouth tape (including an overlap for sewing)

Lengths of horizontal tapes integrate a 25 cm overlap (for sewing).

	S	Z	R	W	W/2	DS	DE	DE-DS	TE	ML(O/P)
A)	0.601	7.877	0.600	0.260	0.130 ( 0)	sh 4.02 ml 0.738	0.727	0.013	0.013	3.2/ 4.3
B)	1.315	7.749	1.302	0.535	0.268 ( 1)	1.444	1.443	0.023	0.036	12.7/ 16.8
C)	2.736	7.197	2.605	1.047	0.523 ( 2)	1.444	1.434	0.014	0.050	19.9/ 23.1
D)	4.156	6.214	3.612	1.442	0.721 ( 3)	sh 22.94 ml 1.444	1.422	0.002	0.052	24.3/ 25.5
E)	5.577	4.862	3.990	1.591	0.795 ( 4)	sh 25.32 ml 1.444	1.421	0.001	0.053	24.6/ 25.5
F)	6.997	3.476	3.720	1.485	0.742 ( 5)	sh 23.62 ml 1.444	1.427	0.006	0.059	21.6/ 23.8
G)	8.418	2.230	3.045	1.220	0.610 ( 6)	1.444	1.431	0.010	0.069	16.8/ 19.5
H) - Nomex -	9.838	1.106	2.177	0.879	0.439 ( 7)	1.500	1.488	0.012	0.081	11.2/ 14.1
	11.314	0.000	1.200	0.495	0.248 ( 8)	sb 7.79 ml				

\*\*\*\*\* Data about the curved sides of the panels

The panels could be trepezoids, but to better the look of the balloon I advice to add a small curve to avoid a 'straight' effect on the panels. For this purpose, you have to curve the top and bottom sides of the panels by adding some millimeters of fabric at the center of the top and bottom sides. This 'adjustement' will be more important if you want few gores and use large fabric rolls.



The 'd' value is the same for the 6 top panels. Its value is : 11.6 mm  
 The value is added two times to the panels : once at the bottom, once at the top but just added once for the top panel (only added at the bottom of this panel)

If you cut the balloon by hand, I advice to use curved edges patterns and not only triangular ones. This is more important if the balloon has few gores.

DXF files do integrate this convexities very well.  
 The 0 bottom panels (and the Nomex) have a maximum height and do not have any added convexity.

The theoretical value of the whole convexity is : 82.7 mm  
 (value taken on the last line of the column TE in the previous table).  
 Practically, the value of the whole convexity is : 165.4 mm  
 In fact, by pragmatism, we make a 'x2' on the theoretical value.



\*\*\*\*\* Datum about stresses \*\*\*\*\*

Load : 130.0 Kg (at the bottom of the balloon, vertically)

Z, R, A : sizes of the balloon, same as thoses wroten at the beginning of this file

P : difference of pressure between inside and outside (approx. model), in kg/m<sup>2</sup>

LN : max load of the slice

FV : vertical stress (z), for the slice.

TM : meridian stress on the fabric, if the fabric carry the whole stress (in kg/m)

TL : meridian stress on the tapes, if the tapes carry the whole stress

TC : circumferential stress on the fabric, in kg/m (max at the parachute hole)

[SECTION FORCES]

N	Z m	R m	A deg	P kg/m <sup>2</sup>	LN Kg	FV Kg	TM Kg/m	TL Kg	TC Kg/m
1	7.910	0.108	88.854	4.113	0.150	0.150	11.087	0.469	11.086
2	7.906	0.216	87.706	4.112	0.451	0.601	11.080	0.938	11.072
3	7.901	0.323	86.555	4.110	0.751	1.352	11.067	1.406	11.042
4	7.893	0.431	85.400	4.107	1.050	2.402	11.050	1.872	10.997
5	7.884	0.539	84.238	4.102	1.349	3.750	11.027	2.335	10.937
6	7.872	0.647	83.069	4.096	1.646	5.396	11.000	2.795	10.863
7	7.857	0.755	81.890	4.090	1.942	7.339	10.968	3.251	10.773
8	7.841	0.863	80.699	4.082	2.237	9.575	10.930	3.703	10.668
9	7.822	0.970	79.496	4.072	2.529	12.104	10.888	4.150	10.548
10	7.801	1.078	78.277	4.062	2.819	14.923	10.840	4.590	10.412
11	7.777	1.186	77.041	4.050	3.107	18.031	10.788	5.025	10.261
12	7.751	1.294	75.785	4.037	3.392	21.423	10.730	5.452	10.094
13	7.723	1.402	74.507	4.023	3.674	25.097	10.667	5.872	9.912
14	7.691	1.510	73.205	4.008	3.953	29.050	10.599	6.284	9.713
15	7.658	1.617	71.875	3.991	4.228	33.278	10.526	6.686	9.498
16	7.621	1.725	70.515	3.972	4.498	37.776	10.447	7.078	9.267
17	7.581	1.833	69.121	3.953	4.765	42.541	10.363	7.460	9.019
18	7.539	1.941	67.688	3.931	5.026	47.567	10.274	7.831	8.754
19	7.493	2.049	66.214	3.908	5.282	52.849	10.179	8.190	8.471
20	7.443	2.157	64.692	3.883	5.533	58.382	10.079	8.536	8.171
21	7.391	2.264	63.118	3.857	5.777	64.159	9.973	8.868	7.853
22	7.334	2.372	61.484	3.828	6.014	70.172	9.861	9.187	7.515
23	7.273	2.480	59.783	3.798	6.243	76.415	9.744	9.490	7.159
24	7.208	2.588	58.007	3.765	6.465	82.880	9.620	9.777	6.782
25	7.138	2.696	56.145	3.730	6.677	89.557	9.491	10.047	6.385
26	7.063	2.804	54.186	3.693	6.879	96.436	9.355	10.300	5.966
27	6.983	2.911	52.113	3.652	7.071	103.507	9.214	10.534	5.524
28	6.895	3.019	49.908	3.608	7.250	110.757	9.065	10.748	5.059
29	6.801	3.127	47.547	3.561	7.415	118.171	8.910	10.942	4.567
30	6.698	3.235	45.000	3.510	7.563	125.734	8.748	11.114	4.049
31	6.605	3.323	42.026	3.459	6.289	132.024	8.512	11.108	-0.157
32	6.512	3.403	39.213	3.410	5.746	137.770	8.316	11.113	0.168
33	6.419	3.475	36.533	3.362	5.252	143.022	8.152	11.125	0.402
34	6.326	3.541	33.965	3.314	4.799	147.821	8.011	11.139	0.569
35	6.233	3.601	31.492	3.265	4.377	152.198	7.889	11.155	0.685
36	6.140	3.655	29.102	3.217	3.983	156.181	7.783	11.172	0.759
37	6.047	3.704	26.782	3.169	3.612	159.793	7.690	11.187	0.800
38	5.954	3.749	24.523	3.120	3.262	163.055	7.608	11.201	0.813
39	5.861	3.789	22.318	3.072	2.930	165.985	7.536	11.214	0.802
40	5.768	3.825	20.158	3.023	2.613	168.598	7.472	11.225	0.770
41	5.675	3.858	18.039	2.975	2.312	170.909	7.416	11.234	0.719
42	5.582	3.886	15.954	2.927	2.023	172.933	7.366	11.241	0.651
43	5.489	3.911	13.899	2.878	1.747	174.680	7.323	11.247	0.567
44	5.396	3.932	11.869	2.830	1.483	176.163	7.286	11.251	0.469
45	5.303	3.950	9.860	2.782	1.229	177.392	7.255	11.253	0.357
46	5.210	3.964	7.868	2.733	0.985	178.377	7.229	11.255	0.231
47	5.117	3.976	5.889	2.685	0.751	179.129	7.209	11.255	0.093
48	5.024	3.984	3.921	2.637	0.526	179.655	7.195	11.255	-0.059
49	4.931	3.988	1.959	2.588	0.310	179.964	7.186	11.254	-0.225
50	4.838	3.990	0.000	2.540	0.101	180.065	7.183	11.254	-0.404
51	4.719	3.988	-2.025	2.485	-0.132	179.934	7.186	11.253	1.454
52	4.599	3.981	-4.041	2.423	-0.385	179.549	7.195	11.250	1.243
53	4.479	3.971	-6.041	2.360	-0.623	178.926	7.211	11.245	1.068
54	4.359	3.956	-8.018	2.298	-0.845	178.081	7.235	11.240	0.927
55	4.240	3.937	-9.963	2.236	-1.050	177.030	7.266	11.234	0.818
56	4.120	3.914	-11.870	2.174	-1.238	175.792	7.304	11.227	0.736
57	4.000	3.887	-13.734	2.111	-1.408	174.384	7.351	11.220	0.679

58	3.881	3.856	-15.549	2.049	-1.559	172.825	7.405	11.212	0.643
59	3.761	3.820	-17.309	1.987	-1.692	171.133	7.468	11.203	0.623
60	3.641	3.781	-19.012	1.925	-1.805	169.328	7.539	11.194	0.618
61	3.522	3.738	-20.655	1.862	-1.900	167.428	7.619	11.183	0.621
62	3.402	3.691	-22.233	1.800	-1.976	165.452	7.708	11.171	0.631
63	3.282	3.640	-23.747	1.738	-2.033	163.418	7.806	11.158	0.644
64	3.162	3.585	-25.195	1.676	-2.073	161.345	7.915	11.144	0.657
65	3.043	3.527	-26.576	1.613	-2.095	159.251	8.034	11.129	0.668
66	2.923	3.466	-27.890	1.551	-2.100	157.151	8.165	11.113	0.675
67	2.803	3.401	-29.137	1.489	-2.089	155.061	8.308	11.095	0.676
68	2.684	3.332	-30.318	1.427	-2.063	152.998	8.465	11.077	0.670
69	2.564	3.261	-31.433	1.364	-2.023	150.975	8.636	11.059	0.657
70	2.444	3.186	-32.484	1.302	-1.970	149.005	8.824	11.040	0.635
71	2.325	3.108	-33.472	1.240	-1.905	147.100	9.029	11.022	0.605
72	2.205	3.028	-34.398	1.178	-1.829	145.271	9.254	11.004	0.568
73	2.085	2.944	-35.264	1.115	-1.744	143.528	9.501	10.987	0.523
74	1.965	2.859	-36.071	1.053	-1.650	141.878	9.773	10.971	0.472
75	1.846	2.770	-36.821	0.991	-1.549	140.329	10.072	10.956	0.416
76	1.726	2.679	-37.514	0.929	-1.443	138.885	10.401	10.943	0.356
77	1.606	2.586	-38.153	0.866	-1.333	137.553	10.764	10.933	0.294
78	1.487	2.491	-38.739	0.804	-1.219	136.333	11.166	10.924	0.230
79	1.367	2.394	-39.273	0.742	-1.104	135.229	11.611	10.918	0.168
80	1.247	2.296	-39.756	0.680	-0.989	134.240	12.106	10.913	0.108
81	1.128	2.195	-40.189	0.617	-0.874	133.366	12.657	10.911	0.052
82	1.008	2.093	-40.575	0.555	-0.762	132.604	13.273	10.911	0.003
83	0.888	1.990	-40.912	0.493	-0.652	131.952	13.962	10.913	-0.039
84	0.768	1.886	-41.203	0.431	-0.547	131.405	14.738	10.916	-0.071
85	0.649	1.781	-41.448	0.368	-0.447	130.958	15.615	10.920	-0.093
86	0.529	1.675	-41.647	0.306	-0.353	130.605	16.611	10.924	-0.102
87	0.409	1.568	-41.802	0.244	-0.265	130.340	17.749	10.928	-0.097
88	0.290	1.461	-41.912	0.182	-0.185	130.155	19.058	10.931	-0.077
89	0.170	1.353	-41.978	0.120	-0.114	130.041	20.577	10.933	-0.042
90	0.050	1.245	-42.000	0.057	-0.050	129.991	22.356	10.932	0.011
91	0.034	1.230	-42.000	0.022	-0.003	129.988	22.630	10.932	0.036
92	0.017	1.215	-42.000	0.013	-0.002	129.987	22.911	10.932	0.022
93	0.000	1.200	-42.000	0.004	0.000	129.986	23.199	10.932	0.007
Max	0.000	0.000	0.000	4.113	7.563	180.065	23.199	11.255	11.086
	m	m	deg	kg/m2	Kg	Kg	Kg/m	Kg	Kg/m
N	Z	R	A	P	LN	FV	TM	TL	TC

[FIN SECTION FORCES]

Max load per tape : 11.25 kg  
 Load per tape at the top (after parac. hole) : 2.59 kg  
 Circ. stress on the fabric at the para hole : 10.90 Kg/m (the most important strength on the fabric)  
 Load at mouth : 10.93 kg

Meridian stress on the fabric, if the fabric carry the whole load :

\* at 3 m below the parachute (s = 3.60 m) : 8.64 kg/m  
 \* At 3 m upon the Nomex (s = 6.84 m) : 7.55 kg/m

Load on the crown ring : 6.65 kg (to divide by the area of section of the ring)

Remind :

\* break stress of the Steel AISI 316 : 52.00 kg/mm2  
 \* break stress of the aluminium HE30TF : 28.54 kg/mm2

\*\*\*\*\* Max. load \*\*\*\*\*

ISA : 15degC, 1013hPa. Load given in kg.

alt (m)	100 deg C						125 deg C				
	ISA-20	ISA-10	ISA	ISA+10	ISA+20		ISA-20	ISA-10	ISA	ISA+10	ISA+20
0	92.6	80.8	69.8	59.5	49.9		107.5	95.6	84.6	74.4	64.8
1000	93.4	82.3	71.9	62.1	52.9		107.2	96.1	85.8	76.0	66.9
2000	88.8	79.0	69.7	60.9	52.5		100.8	91.1	81.9	73.3	65.0
3000	83.9	75.3	67.1	59.2	51.7		94.4	86.0	77.9	70.2	62.8
4000	78.8	71.3	64.2	57.2	50.6		88.0	80.7	73.7	66.9	60.4
5000	73.6	67.2	61.0	54.9	49.0		81.6	75.4	69.3	63.5	57.7

\*\*\*\*\* Datum about the parachute \*\*\*\*\*

All the sizes are given in meters (sizes given without/with margin to sew)

W : width without margin (size of the sewn panel)

W+m : width with the margin to sew

W+m/2 : (width with the margin to sew)/2

	Z	R	S	W	W+m	W+m/2
	m	m	m	m	m	m
0	7.911	0.000	0.000	0.000	0.024	0.012
1	7.910	0.100	0.100	0.039	0.063	0.032
2	7.907	0.200	0.200	0.079	0.103	0.051
3	7.903	0.300	0.300	0.118	0.142	0.071
4	7.897	0.400	0.400	0.157	0.181	0.091
5	7.890	0.500	0.501	0.196	0.220	0.110
6	7.880	0.600	0.601	0.236	0.260	0.130
7	7.869	0.700	0.702	0.275	0.299	0.149
8	7.857	0.800	0.802	0.314	0.338	0.169
9	7.842	0.900	0.903	0.353	0.377	0.189
10	7.826	1.000	1.005	0.393	0.417	0.208

To get a parachute which is a circle, it is necessary to make a curved and not straight edge.

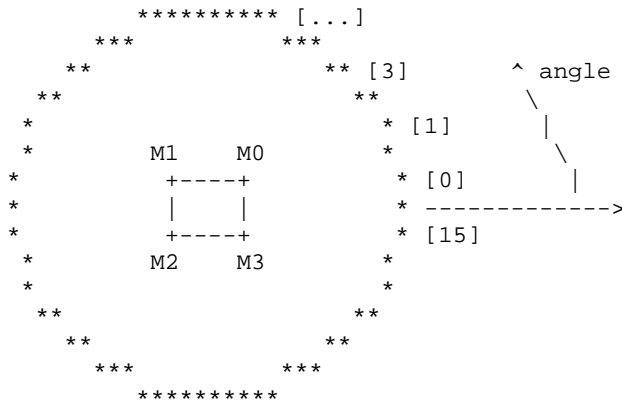


With  $d = 7.6$  cm

The dxf files are not written for the parachute. You must do the pattern by hand and cut the parachute panel with this pattern !

\*\*\*\*\* Datum about cables \*\*\*\*\*

All the sizes are given in meters (sizes given without/with margin to sew)



M0 to M3 are the corners of the frame burner.  
 [i] is the number of the cable fastened to the mouth (the circle).  
 M0-M1 is 0.500 m.  
 M1-M2 is 0.500 m.

The balloon has a number of cables multiple of 4.  
 So the first 4 sizes of the cables are given.  
 Sizes of cables are given from mouth to frame.  
 You have to subtract the size of crimpings, carabiners and the loop on the envelope.  
 And you have to add the length for the crimping.

Length of cable [ 0 ] : 1.276 m connected to the point M0, at the angle 11.3 degrees  
 Length of cable [ 1 ] : 1.225 m connected to the point M0, at the angle 33.8 degrees  
 Length of cable [ 2 ] : 1.225 m connected to the point M0, at the angle 56.2 degrees  
 Length of cable [ 3 ] : 1.276 m connected to the point M0, at the angle 78.7 degrees