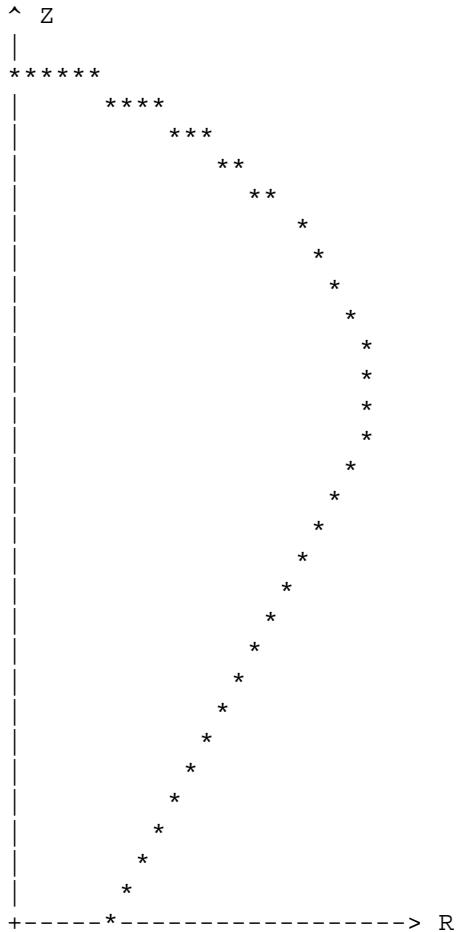


Begin of file for a 400.00 m3 / 14125.84 cu.ft balloon
Version 2.7.253 du 10 septembre 2001

***** 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 : 14125.84 cu.ft or 400.00 m3

Table of the balloon shape (Deramecourt type)

----- Top ellipse -----						
	Z	R	S	A	TP	Tt
	m	m	m	deg	m2	m2
0	9.468	0.000	0.000	90.000	0.000	0.000
1	9.466	0.126	0.126	88.854	0.050	0.050
2	9.463	0.252	0.252	87.706	0.150	0.200
3	9.456	0.378	0.378	86.555	0.250	0.449
4	9.448	0.504	0.505	85.400	0.350	0.799
5	9.436	0.630	0.631	84.238	0.451	1.250
6	9.422	0.756	0.758	83.069	0.552	1.802
7	9.405	0.882	0.885	81.890	0.654	2.456
8	9.386	1.008	1.012	80.699	0.757	3.213
9	9.364	1.134	1.140	79.496	0.861	4.073
10	9.339	1.260	1.269	78.277	0.966	5.039
11	9.312	1.386	1.398	77.041	1.072	6.111
12	9.281	1.512	1.527	75.785	1.180	7.291
13	9.248	1.638	1.658	74.507	1.290	8.581
14	9.212	1.764	1.789	73.205	1.402	9.983
15	9.172	1.890	1.921	71.875	1.516	11.499
16	9.129	2.016	2.054	70.515	1.633	13.132
17	9.083	2.142	2.188	69.121	1.753	14.886
18	9.033	2.268	2.324	67.688	1.877	16.763
19	8.979	2.394	2.461	66.214	2.005	18.768
20	8.922	2.520	2.599	64.692	2.138	20.907
21	8.860	2.646	2.739	63.118	2.277	23.184
22	8.794	2.772	2.882	61.484	2.422	25.606
23	8.723	2.898	3.026	59.783	2.575	28.181
24	8.647	3.024	3.173	58.007	2.738	30.918
25	8.565	3.150	3.324	56.145	2.911	33.829
26	8.478	3.276	3.477	54.186	3.099	36.928
27	8.383	3.402	3.634	52.113	3.303	40.231
28	8.281	3.528	3.797	49.908	3.529	43.760
29	8.171	3.654	3.964	47.547	3.782	47.542
30	8.050	3.780	4.139	45.000	4.071	51.613
----- Middle ellipse -----						
30	8.050	3.780	4.139	45.000	4.071	51.613
31	7.942	3.883	4.288	42.026	3.606	55.219
32	7.833	3.976	4.431	39.213	3.533	58.753
33	7.724	4.061	4.569	36.533	3.475	62.227
34	7.616	4.137	4.702	33.965	3.426	65.653
35	7.507	4.207	4.831	31.492	3.385	69.038
36	7.398	4.271	4.957	29.102	3.351	72.389
37	7.290	4.328	5.080	26.782	3.322	75.711
38	7.181	4.380	5.200	24.523	3.297	79.008
39	7.073	4.428	5.319	22.318	3.276	82.284
40	6.964	4.470	5.435	20.158	3.258	85.542
41	6.855	4.507	5.550	18.039	3.242	88.784
42	6.747	4.541	5.664	15.954	3.229	92.013
43	6.638	4.570	5.776	13.899	3.218	95.230
44	6.529	4.594	5.888	11.869	3.208	98.439
45	6.421	4.615	5.998	9.860	3.200	101.639
46	6.312	4.632	6.108	7.868	3.194	104.833
47	6.204	4.645	6.218	5.889	3.189	108.022
48	6.095	4.655	6.327	3.921	3.186	111.208
49	5.986	4.660	6.436	1.959	3.183	114.391
50	5.878	4.662	6.544	0.000	3.182	117.573

----- Cosine part -----						
50	5.878	4.662	6.544	0.000	3.182	117.573
51	5.738	4.660	6.684	-2.025	4.096	121.669
52	5.598	4.652	6.824	-4.041	4.097	125.766
53	5.458	4.640	6.965	-6.041	4.099	129.865
54	5.318	4.623	7.106	-8.018	4.101	133.965
55	5.178	4.600	7.247	-9.963	4.103	138.068
56	5.038	4.573	7.390	-11.870	4.105	142.174
57	4.899	4.542	7.533	-13.734	4.107	146.281
58	4.759	4.505	7.678	-15.549	4.108	150.389
59	4.619	4.464	7.823	-17.309	4.109	154.498
60	4.479	4.418	7.971	-19.012	4.107	158.605
61	4.339	4.367	8.119	-20.655	4.104	162.709
62	4.199	4.312	8.270	-22.233	4.098	166.807
63	4.059	4.253	8.421	-23.747	4.089	170.895
64	3.920	4.189	8.575	-25.195	4.076	174.971
65	3.780	4.122	8.731	-26.576	4.059	179.030
66	3.640	4.050	8.888	-27.890	4.038	183.068
67	3.500	3.974	9.047	-29.137	4.012	187.081
68	3.360	3.894	9.208	-30.318	3.981	191.062
69	3.220	3.810	9.371	-31.433	3.944	195.006
70	3.080	3.723	9.536	-32.484	3.901	198.907
71	2.941	3.632	9.703	-33.472	3.853	202.759
72	2.801	3.538	9.871	-34.398	3.797	206.557
73	2.661	3.440	10.042	-35.264	3.736	210.293
74	2.521	3.340	10.214	-36.071	3.667	213.960
75	2.381	3.237	10.388	-36.821	3.593	217.553
76	2.241	3.131	10.563	-37.514	3.511	221.064
77	2.101	3.022	10.740	-38.153	3.423	224.487
78	1.962	2.911	10.919	-38.739	3.329	227.816
79	1.822	2.798	11.099	-39.273	3.228	231.044
80	1.682	2.682	11.280	-39.756	3.121	234.165
81	1.542	2.565	11.463	-40.189	3.009	237.174
82	1.402	2.446	11.646	-40.575	2.891	240.065
83	1.262	2.326	11.831	-40.912	2.767	242.832
84	1.122	2.204	12.017	-41.203	2.639	245.472
85	0.983	2.081	12.203	-41.448	2.507	247.979
86	0.843	1.957	12.390	-41.647	2.371	250.349
87	0.703	1.832	12.577	-41.802	2.231	252.580
88	0.563	1.707	12.765	-41.912	2.088	254.668
89	0.423	1.581	12.953	-41.978	1.942	256.610
90	0.283	1.455	13.141	-42.000	1.795	258.405
----- Bottom cone -----						
90	0.283	1.455	13.141	-42.000	1.795	258.405
91	0.189	1.370	13.268	-42.000	1.127	259.532
92	0.094	1.285	13.395	-42.000	1.060	260.592
93	0.000	1.200	13.522	-42.000	0.992	261.583

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

USER INPUTS

Asked volume : 14125.84 cu.ft or 400.00 m3 with 16 gores
Mouth radius : 1.200 m
Parachute radius : 1.500 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 : 200.0 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: 37.0 degrees

WEIGHTS

Weight of fabric : 50.0 g/m2
Weight of Nomex : 50.0 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 : 10.0 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 : 4.662 m
Height of the top : 9.468 m
Length of a gore : 13.522 m from center of parachute to the mouth
Length of a gore * : 10.531 m from border of parachute to top of Nomex
Area : 261.58 m2 (including Nomex panels and parachute but without overlap of parachute)
Number of panels : 9
Panels : 1 (nomex) and 7 with convexity and a half panel at the top
Nomex panel : 1.500 (1.476 without margins)
7 panels : 1.426 (1.402 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 : 171.82 ml (253.60 m2) - without the parachute
Max fabric quantity : 188.45 ml (278.16 m2) - without the parachute
Parachute fabric : 9.07 ml (11.34 m2) quantity in 'ml' includes +20 percents for the cutting
Fabric to buy : 189.21 ml (283.81 m2)
Nomex for bottom panel: 11.21 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 : 13.91 ml (scoop + first panel)

Length to sew : 450 ml
Thread to buy : 2701 ml
Traction cord : 57.8 ml about (polyester or kevlar)
Centring cord : 45.9 ml about (polyester or kevlar)
Z Centring cord : 1.40 m below the top of the parachute
Command line : 18.5 (23.9) ml about without (with) a return pulley
Crown line : 15.0
Length of each tape : 14.52 ml (which 1.00 ml are used to attach crown ring and bottom cables)
Vertical tape (1): 232.36 ml
Horizontal tape (1): 90.12 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): 338.48 ml
Tape to buy (2): 7.54 ml
Cable to buy : 26.15 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 : 12.452 kg (including the overlap of the parachute)
Weight of Nomex : 1.010 kg
Weight of tapes (1) : 6.770 kg
Weight of tapes (2) : 0.151 kg
Weight of tract. cord : 0.578 kg
Weight of centr. cord : 0.459 kg
Weight of command line: 0.185 (0.239) kg about without (with) a return pulley
Weight of crown line : 0.150
Weight of cables : 0.261 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 : 0.216 kg
Total weight : 22.462 kg (token without return pulley)

PRICES CALCULATION (without unit)

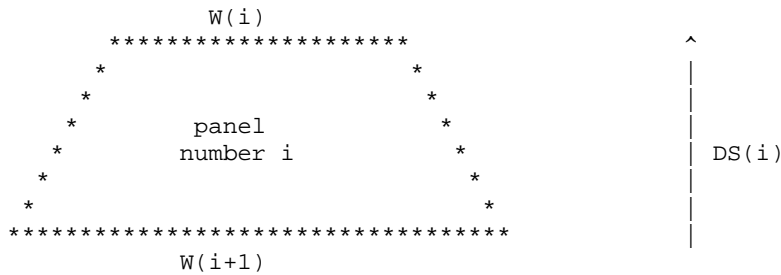
Price of fabric : 498.09 (including the overlap of the parachute)
Price of Nomex : 40.39
Price of tapes (1) : 338.48
Price of tapes (2) : 7.54
Price of tract. cord : 0.00
Price of centr. cord : 0.00
Price of command line : 0.00 (0.00) about without (with) a return pulley
Price of crown line : 22.53
Price of cables : 39.22
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 : 67.53
Total Price : 1043.78 (token 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)
	1.515	9.284	1.500	0.589	0.295 (0)	sh 9.42 ml				
A)	2.230	9.067	2.181	0.857	0.428 (1)	0.715	0.728	0.012	0.012	6.0/ 7.0
B)	3.633	8.384	3.400	1.335	0.668 (2)	1.402	1.423	0.020	0.033	17.9/ 21.7
C)	5.035	7.330	4.307	1.691	0.846 (3)	sh 27.06 ml	1.414	0.011	0.044	24.6/ 27.4
D)	6.437	5.985	4.660	1.830	0.915 (4)	sh 29.28 ml	1.404	0.002	0.046	28.6/ 29.7
E)	7.839	4.604	4.459	1.751	0.875 (5)	1.402	1.403	0.001	0.046	29.0/ 29.7
F)	9.242	3.331	3.876	1.522	0.761 (6)	sh 24.36 ml	1.407	0.005	0.051	26.6/ 28.4
G)	10.644	2.178	3.081	1.210	0.605 (7)	1.402	1.411	0.009	0.060	22.2/ 24.7
H)	12.046	1.100	2.184	0.858	0.429 (8)	1.402	1.413	0.011	0.071	16.9/ 19.7
I) - Nomex -	13.522	0.000	1.200	0.471	0.236 (9)	sb 7.54 ml	1.476	0.013	0.083	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)
	1.515	9.284	1.500	0.613	0.307	(0) sh 9.67 ml				
A)						0.739	0.728	0.012	0.012	6.0/ 7.0
	2.230	9.067	2.181	0.881	0.440	(1)				
B)						1.426	1.423	0.020	0.033	17.9/ 21.7
	3.633	8.384	3.400	1.359	0.680	(2)				
C)						1.426	1.414	0.011	0.044	24.6/ 27.4
	5.035	7.330	4.307	1.715	0.858	(3) sh 27.31 ml				
D)						1.426	1.404	0.002	0.046	28.6/ 29.7
	6.437	5.985	4.660	1.854	0.927	(4) sh 29.53 ml				
E)						1.426	1.403	0.001	0.046	29.0/ 29.7
	7.839	4.604	4.459	1.775	0.887	(5)				
F)						1.426	1.407	0.005	0.051	26.6/ 28.4
	9.242	3.331	3.876	1.546	0.773	(6) sh 24.61 ml				
G)						1.426	1.411	0.009	0.060	22.2/ 24.7
	10.644	2.178	3.081	1.234	0.617	(7)				
H)						1.426	1.413	0.011	0.071	16.9/ 19.7
	12.046	1.100	2.184	0.882	0.441	(8)				
I) - Nomex -						1.500	1.489	0.013	0.083	11.2/ 14.1
	13.522	0.000	1.200	0.495	0.248	(9) 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 7 top panels. Its value is : 10.4 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 : 84.2 mm
 (value taken on the last line of the column TE in the previous table).
 Practically, the value of the whole convexity is : 168.5 mm
 In fact, by pragmatism, we make a 'x2' on the theoretical value.

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

Load : 200.0 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/m2

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/m2	LN Kg	FV Kg	TM Kg/m	TL Kg	TC Kg/m
1	9.466	0.126	88.854	4.734	0.236	0.236	14.908	0.738	14.907
2	9.463	0.252	87.706	4.732	0.708	0.944	14.898	1.474	14.887
3	9.456	0.378	86.555	4.730	1.179	2.124	14.881	2.209	14.848
4	9.448	0.504	85.400	4.726	1.650	3.773	14.858	2.941	14.788
5	9.436	0.630	84.238	4.721	2.119	5.892	14.828	3.668	14.708
6	9.422	0.756	83.069	4.715	2.586	8.479	14.792	4.391	14.608
7	9.405	0.882	81.890	4.707	3.052	11.531	14.749	5.108	14.489
8	9.386	1.008	80.699	4.698	3.514	15.045	14.699	5.818	14.348
9	9.364	1.134	79.496	4.688	3.974	19.019	14.642	6.520	14.188
10	9.339	1.260	78.277	4.676	4.431	23.450	14.579	7.213	14.007
11	9.312	1.386	77.041	4.663	4.884	28.334	14.508	7.896	13.805
12	9.281	1.512	75.785	4.648	5.332	33.666	14.431	8.568	13.583
13	9.248	1.638	74.507	4.632	5.776	39.441	14.347	9.229	13.339
14	9.212	1.764	73.205	4.615	6.214	45.656	14.256	9.875	13.073
15	9.172	1.890	71.875	4.596	6.647	52.303	14.158	10.508	12.787
16	9.129	2.016	70.515	4.575	7.074	59.376	14.053	11.126	12.478
17	9.083	2.142	69.121	4.553	7.493	66.870	13.941	11.727	12.146
18	9.033	2.268	67.688	4.529	7.905	74.775	13.822	12.310	11.792
19	8.979	2.394	66.214	4.503	8.309	83.084	13.695	12.875	11.415
20	8.922	2.520	64.692	4.475	8.705	91.789	13.561	13.420	11.014
21	8.860	2.646	63.118	4.445	9.090	100.879	13.420	13.944	10.588
22	8.794	2.772	61.484	4.413	9.465	110.344	13.271	14.446	10.138
23	8.723	2.898	59.783	4.379	9.828	120.172	13.114	14.924	9.661
24	8.647	3.024	58.007	4.342	10.179	130.351	12.949	15.377	9.158
25	8.565	3.150	56.145	4.303	10.516	140.867	12.776	15.804	8.627
26	8.478	3.276	54.186	4.261	10.837	151.704	12.595	16.203	8.068
27	8.383	3.402	52.113	4.215	11.142	162.846	12.406	16.573	7.477
28	8.281	3.528	49.908	4.166	11.428	174.274	12.208	16.913	6.855
29	8.171	3.654	47.547	4.113	11.692	185.966	12.001	17.219	6.198
30	8.050	3.780	45.000	4.055	11.931	197.897	11.784	17.492	5.505
31	7.942	3.883	42.026	3.998	9.926	207.823	11.467	17.486	-0.156
32	7.833	3.976	39.213	3.944	9.072	216.894	11.205	17.496	0.285
33	7.724	4.061	36.533	3.889	8.296	225.190	10.984	17.516	0.605
34	7.616	4.137	33.965	3.835	7.582	232.772	10.796	17.541	0.834
35	7.507	4.207	31.492	3.781	6.919	239.692	10.634	17.568	0.994
36	7.398	4.271	29.102	3.726	6.299	245.991	10.492	17.596	1.099
37	7.290	4.328	26.782	3.672	5.716	251.707	10.368	17.622	1.159
38	7.181	4.380	24.523	3.618	5.163	256.870	10.258	17.646	1.181
39	7.073	4.428	22.318	3.563	4.640	261.510	10.162	17.668	1.171
40	6.964	4.470	20.158	3.509	4.141	265.651	10.076	17.687	1.133
41	6.855	4.507	18.039	3.455	3.665	269.315	10.001	17.702	1.069
42	6.747	4.541	15.954	3.401	3.209	272.525	9.935	17.715	0.983
43	6.638	4.570	13.899	3.346	2.773	275.298	9.878	17.725	0.876
44	6.529	4.594	11.869	3.292	2.355	277.653	9.828	17.732	0.749
45	6.421	4.615	9.860	3.238	1.953	279.606	9.787	17.737	0.604
46	6.312	4.632	7.868	3.183	1.567	281.172	9.753	17.740	0.440
47	6.204	4.645	5.889	3.129	1.195	282.367	9.726	17.742	0.259
48	6.095	4.655	3.921	3.075	0.837	283.205	9.706	17.742	0.060
49	5.986	4.660	1.959	3.020	0.493	283.698	9.695	17.741	-0.156
50	5.878	4.662	0.000	2.966	0.161	283.859	9.691	17.741	-0.390
51	5.738	4.660	-2.025	2.904	-0.210	283.649	9.695	17.739	2.124
52	5.598	4.652	-4.041	2.834	-0.615	283.034	9.707	17.734	1.849
53	5.458	4.640	-6.041	2.764	-0.996	282.038	9.729	17.726	1.622

54	5.318	4.623	-8.018	2.694	-1.353	280.686	9.759	17.716	1.442
55	5.178	4.600	-9.963	2.624	-1.683	279.003	9.800	17.705	1.304
56	5.038	4.573	-11.870	2.554	-1.987	277.016	9.851	17.692	1.204
57	4.899	4.542	-13.734	2.484	-2.262	274.754	9.912	17.678	1.138
58	4.759	4.505	-15.549	2.414	-2.508	272.246	9.983	17.662	1.100
59	4.619	4.464	-17.309	2.344	-2.725	269.520	10.065	17.644	1.085
60	4.479	4.418	-19.012	2.274	-2.913	266.607	10.159	17.624	1.088
61	4.339	4.367	-20.655	2.205	-3.071	263.537	10.263	17.602	1.104
62	4.199	4.312	-22.233	2.135	-3.199	260.338	10.380	17.578	1.128
63	4.059	4.253	-23.747	2.065	-3.298	257.040	10.508	17.551	1.156
64	3.920	4.189	-25.195	1.995	-3.369	253.671	10.650	17.521	1.185
65	3.780	4.122	-26.576	1.925	-3.412	250.258	10.806	17.489	1.210
66	3.640	4.050	-27.890	1.855	-3.429	246.830	10.976	17.454	1.229
67	3.500	3.974	-29.137	1.785	-3.420	243.410	11.162	17.417	1.240
68	3.360	3.894	-30.318	1.715	-3.386	240.024	11.365	17.378	1.241
69	3.220	3.810	-31.433	1.645	-3.330	236.693	11.588	17.338	1.231
70	3.080	3.723	-32.484	1.575	-3.253	233.440	11.831	17.296	1.209
71	2.941	3.632	-33.472	1.505	-3.157	230.283	12.098	17.254	1.175
72	2.801	3.538	-34.398	1.435	-3.043	227.239	12.389	17.212	1.130
73	2.661	3.440	-35.264	1.365	-2.914	224.326	12.709	17.171	1.074
74	2.521	3.340	-36.071	1.295	-2.771	221.555	13.061	17.132	1.008
75	2.381	3.237	-36.821	1.226	-2.616	218.939	13.448	17.094	0.934
76	2.241	3.131	-37.514	1.156	-2.452	216.487	13.875	17.058	0.854
77	2.101	3.022	-38.153	1.086	-2.280	214.207	14.346	17.025	0.769
78	1.962	2.911	-38.739	1.016	-2.103	212.105	14.867	16.995	0.681
79	1.822	2.798	-39.273	0.946	-1.922	210.183	15.445	16.969	0.593
80	1.682	2.682	-39.756	0.876	-1.740	208.443	16.088	16.946	0.507
81	1.542	2.565	-40.189	0.806	-1.558	206.885	16.804	16.926	0.426
82	1.402	2.446	-40.575	0.736	-1.379	205.506	17.604	16.910	0.351
83	1.262	2.326	-40.912	0.666	-1.203	204.303	18.502	16.897	0.284
84	1.122	2.204	-41.203	0.596	-1.034	203.269	19.512	16.886	0.229
85	0.983	2.081	-41.448	0.526	-0.871	202.398	20.655	16.876	0.188
86	0.843	1.957	-41.647	0.456	-0.717	201.681	21.953	16.869	0.161
87	0.703	1.832	-41.802	0.386	-0.574	201.107	23.437	16.861	0.152
88	0.563	1.707	-41.912	0.316	-0.441	200.666	25.147	16.853	0.162
89	0.423	1.581	-41.978	0.247	-0.320	200.346	27.131	16.844	0.192
90	0.283	1.455	-42.000	0.177	-0.212	200.134	29.458	16.832	0.243
91	0.189	1.370	-42.000	0.118	-0.089	200.045	31.272	16.824	0.224
92	0.094	1.285	-42.000	0.071	-0.050	199.995	33.332	16.820	0.126
93	0.000	1.200	-42.000	0.024	-0.016	199.979	35.690	16.819	0.039
Max	0.000	0.000	0.000	4.734	11.931	283.859	35.690	17.742	14.907

N	m	m	deg	kg/m2	Kg	Kg	Kg/m	Kg	Kg/m
Z	R	A	P	LN	FV	TM	TL	TC	

[FIN SECTION FORCES]

Max load per tape : 17.74 kg
 Load per tape at the top (after parac. hole) : 8.50 kg
 Circ. stress on the fabric at the para hole : 13.60 Kg/m (the most important strength on the fabric)
 Load at mouth : 16.82 kg

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

* at 3 m below the parachute (s = 4.51 m) : 11.07 kg/m
 * At 3 m upon the Nomex (s = 9.05 m) : 11.16 kg/m

Load on the crown ring : 21.80 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	148.2	129.3	111.7	95.2	79.8		172.0	153.0	135.4	119.0	103.6
1000	149.5	131.7	115.0	99.3	84.6		171.5	153.8	137.2	121.6	107.0
2000	142.1	126.3	111.5	97.4	84.1		161.3	145.8	131.1	117.2	104.0
3000	134.2	120.4	107.3	94.8	82.8		151.0	137.5	124.6	112.3	100.6
4000	126.1	114.2	102.7	91.6	80.9		140.7	129.1	117.9	107.1	96.6
5000	117.8	107.6	97.6	87.9	78.5		130.5	120.6	110.9	101.5	92.4

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

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

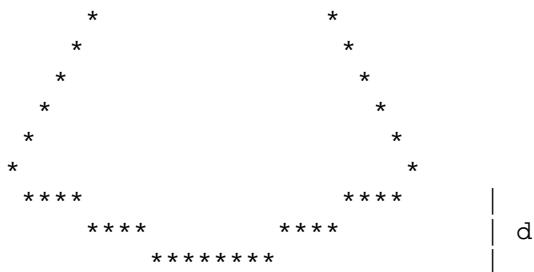
W : width without margin (size of the sewn panel)

W+m : width with the margin to sew

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

	Z m	R m	S m	W m	W+m m	W+m/2 m
0	9.468	0.000	0.000	0.000	0.024	0.012
1	9.467	0.100	0.100	0.039	0.063	0.032
2	9.465	0.200	0.200	0.079	0.103	0.051
3	9.461	0.300	0.300	0.118	0.142	0.071
4	9.456	0.400	0.400	0.157	0.181	0.091
5	9.450	0.500	0.500	0.196	0.220	0.110
6	9.442	0.600	0.601	0.236	0.260	0.130
7	9.432	0.700	0.701	0.275	0.299	0.149
8	9.421	0.800	0.802	0.314	0.338	0.169
9	9.409	0.900	0.903	0.353	0.377	0.189
10	9.395	1.000	1.003	0.393	0.417	0.208
11	9.380	1.100	1.105	0.432	0.456	0.228
12	9.363	1.200	1.206	0.471	0.495	0.248
13	9.344	1.300	1.308	0.511	0.535	0.267
14	9.324	1.400	1.410	0.550	0.574	0.287
15	9.303	1.500	1.512	0.589	0.613	0.307
16	9.279	1.600	1.615	0.628	0.652	0.326
17	9.254	1.700	1.718	0.668	0.692	0.346
18	9.227	1.800	1.822	0.707	0.731	0.365
19	9.198	1.900	1.926	0.746	0.770	0.385

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

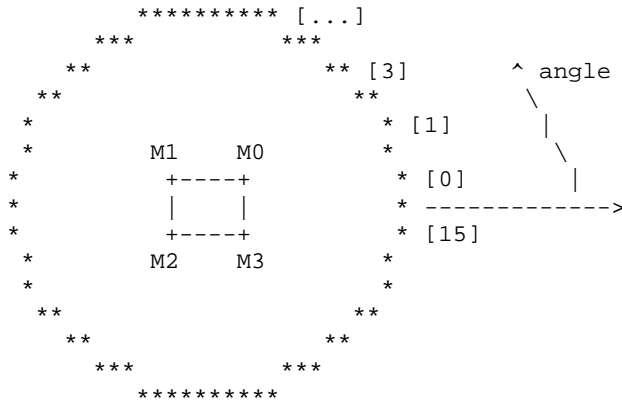


With $d = 14.7$ cm

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] : 1.456 m connected to the point M0, at the angle 11.3 degrees
Length of cable [1] : 1.412 m connected to the point M0, at the angle 33.8 degrees
Length of cable [2] : 1.412 m connected to the point M0, at the angle 56.2 degrees
Length of cable [3] : 1.456 m connected to the point M0, at the angle 78.7 degrees