Pino Parana				
	Emin=	5700	Mpa	
	Fc=	7.5	MPa	
Le/d	Fce	Coeficiente Cp		
	[Mpa]	Aserrada	Rollizo	Laminada
1	4685	1.000	1.000	1.000
2	1171	0.999	0.999	0.999
3	521	0.997	0.998	0.999
4	293	0.995	0.996	0.997
5	187	0.992	0.994	0.996
6	130	0.988	0.991	0.994
7	96	0.984	0.988	0.992
8	73	0.978	0.983	0.989
9	58	0.972	0.979	0.986
10	47	0.965	0.973	0.982
11	39	0.957	0.967	0.977
12	33	0.947	0.959	0.972
13	28	0.936	0.951	0.966
14	24	0.924	0.941	0.959
15	21	0.911	0.930	0.951
16	18	0.896	0.917	0.941
17	16	0.879	0.903	0.930
18	14	0.861	0.887	0.917
19	13	0.841	0.869	0.902
20	12	0.819	0.849	0.884
21	11	0.796	0.826	0.865
22	10	0.771	0.802	0.842
23	9	0.745	0.776	0.817
24	8	0.718	0.749	0.789
25	7	0.691	0.721	0.760
26	7	0.663	0.692	0.729
27	6	0.635	0.662	0.697
28	6	0.608	0.633	0.665
29	6	0.581	0.604	0.633
30	5	0.555	0.576	0.603
31	5	0.530	0.550	0.573
32	5	0.506	0.524	0.545
33	4	0.483	0.499	0.518
34	4	0.461	0.476	0.493
35	4	0.441	0.454	0.469
36	4	0.421	0.433	0.446
37	3	0.402	0.413	0.425
38	3	0.385	0.394	0.405
39	3	0.368	0.377	0.386
40	3	0.352	0.360	0.369
41	3	0.337	0.344	0.352
42	3	0.323	0.330	0.337
43	3	0.310	0.316	0.323
44	2	0.297	0.303	0.309
45	2	0.286	0.291	0.296
46	2	0.274	0.279	0.284
47	2	0.264	0.268	0.273
48	2	0.254	0.258	0.262
49	2	0.244	0.248	0.252
50	2	0.235	0.239	0.242

Alamo				
	Emin=	4000	Mpa	
	Fc=	6.3	MPa	
Le/d	Fce	Coeficiente Cp		
	[Mpa]	Aserrada	Rollizo	Laminada
1	3288	1.000	1.000	1.000
2	822	0.998	0.999	0.999
3	365	0.997	0.997	0.998
4	206	0.994	0.995	0.997
5	132	0.990	0.993	0.995
6	91	0.986	0.989	0.993
7	67	0.980	0.985	0.990
8	51	0.974	0.980	0.986
9	41	0.966	0.974	0.982
10	33	0.957	0.967	0.977
11	27	0.947	0.959	0.972
12	23	0.935	0.949	0.965
13	19	0.922	0.939	0.957
14	17	0.906	0.926	0.948
15	15	0.889	0.911	0.937
16	13	0.870	0.895	0.924
17	11	0.849	0.876	0.908
18	10	0.826	0.855	0.890
19	9	0.801	0.831	0.869
20	8	0.774	0.805	0.845
21	7	0.746	0.777	0.817
22	7	0.716	0.747	0.787
23	6	0.686	0.716	0.755
24	6	0.656	0.684	0.720
25	5	0.626	0.652	0.686
26	5	0.596	0.620	0.651
27	5	0.567	0.589	0.617
28	4	0.539	0.559	0.584
29	4	0.513	0.531	0.552
30	4	0.487	0.503	0.523
31	3	0.463	0.478	0.495
32	3	0.440	0.453	0.468
33	3	0.419	0.430	0.444
34	3	0.399	0.409	0.421
35	3	0.380	0.389	0.399
36	3	0.362	0.370	0.379
37	2	0.345	0.352	0.361
38	2	0.329	0.336	0.343
39	2	0.314	0.320	0.327
40	2	0.300	0.306	0.312
41	2	0.287	0.292	0.298
42	2	0.275	0.280	0.285
43	2	0.263	0.268	0.272
44	2	0.253	0.256	0.260
45	2	0.242	0.246	0.249
46	2	0.233	0.236	0.239
47	1	0.223	0.226	0.229
48	1	0.215	0.217	0.220
49	1	0.207	0.209	0.212
50	1	0.199	0.201	0.204

Pino elliotis				
	Emin=	4700	Mpa	
	Fc=	6.3	MPa	
Le/d	Fce	Coeficiente Cp		
	[Mpa]	Aserrada	Rollizo	Laminada
1	3863	1.000	1.000	1.000
2	966	0.999	0.999	0.999
3	429	0.997	0.998	0.999
4	241	0.995	0.996	0.997
5	155	0.992	0.994	0.996
6	107	0.988	0.991	0.994
7	79	0.983	0.987	0.991
8	60	0.978	0.983	0.989
9	48	0.971	0.978	0.985
10	39	0.964	0.973	0.981
11	32	0.956	0.966	0.977
12	27	0.946	0.958	0.971
13	23	0.935	0.950	0.965
14	20	0.923	0.940	0.958
15	17	0.909	0.928	0.949
16	15	0.894	0.915	0.939
17	13	0.877	0.900	0.928
18	12	0.858	0.884	0.915
19	11	0.837	0.865	0.899
20	10	0.815	0.845	0.881
21	9	0.791	0.822	0.860
22	8	0.766	0.797	0.837
23	7	0.739	0.771	0.811
24	7	0.712	0.743	0.783
25	6	0.684	0.714	0.752
26	6	0.656	0.684	0.721
27	5	0.629	0.655	0.689
28	5	0.601	0.625	0.657
29	5	0.574	0.597	0.625
30	4	0.548	0.569	0.594
31	4	0.523	0.542	0.565
32	4	0.499	0.516	0.537
33	4	0.476	0.492	0.510
34	3	0.455	0.469	0.485
35	3	0.434	0.447	0.461
36	3	0.414	0.426	0.439
37	3	0.396	0.406	0.418
38	3	0.379	0.388	0.398
39	3	0.362	0.370	0.380
40	2	0.347	0.354	0.363
41	2	0.332	0.339	0.346
42	2	0.318	0.324	0.331
43	2	0.305	0.311	0.317
44	2	0.293	0.298	0.304
45	2	0.281	0.286	0.291
46	2	0.270	0.274	0.279
47	2	0.259	0.263	0.268
48	2	0.250	0.253	0.257
49	2	0.240	0.244	0.247
50	2	0.231	0.235	0.238

$$F=P/A < Cp.Fc$$

P= máximo valor entre:

PD/0.9

(PD+PL)/1.0

(Pd+PS)/1.15

(PD+PW)/1.60

(PD+PS+PLr)/1.15

(PD+0.25PL+PE)/2.00

A=área de la sección

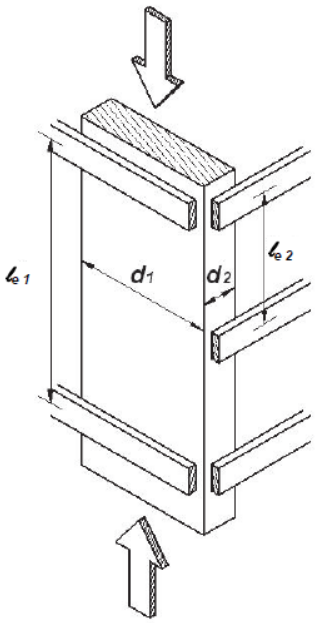
Le=Longitud no arriostrada (Pandeo)

d=ancho del elemento en la dirección no arriostrada considerada

Le/d= Esbeltez geométrica

f=P/A = Tensión de trabajo del elemento

Cp.Fc= Tensión limite del material



$$C_P = \left[\frac{1+\left(F_{cE}/F_c^*\right)}{2c} - \sqrt{\left[\frac{1+\left(F_{cE}/F_c^*\right)}{2c}\right]^2 - \frac{F_{cE}/F_c^*}{c}}\right]$$

$$F_{cE} = \frac{0{,}822E'_{mín}}{\left(\ell_e/d\right)^2}$$

casos de vinculación						
ke teórico	0,50	0,70	1,00	1,00	2,00	2,00
ke recomendado	0,65	0,80	1,20	1,00	2,10	2,40

impedidas la traslación y la rotación
impedida la traslación y libre la rotación
libre la traslación e impedida la rotación
libre la traslación y libre la rotación