

5

PERFILES ESTRUCTURALES ABIERTOS C Y Z

NEGROS Y GALVANIZADOS

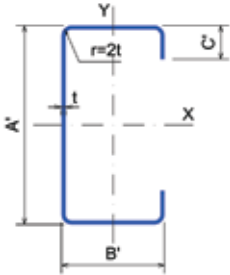
NTC 5685
Norma de referencia
ASTM A - 1011 Grado 50



Pórticos - Cerchas - Columnas - Vigas - Viguetas - Correas

SECCION C

PERFILES C NEGROS
GRADO 50



CODIGO	MIEMBRO						PROPIEDADES SECCION BRUTA											PROPIEDADES TORSIONALES				
	ALMA (mm)	ALA (mm)	PESTA- ÑA (mm)	ESPE- SOR (mm)	PESO NEGRO	AREA (mm2)	Lx (cm4)	Sx (cm3)	Rx (cm)	Ycg (mm)	Ly (cm4)	Sy (cm3)	Ry (cm)	Xcg (mm)	Lx (cm4)	Xo (cm)	Ro (cm)	Cw (cm6)	Jv (cm)			
C76X38X15	76	38	15	2.00	2.60	3.308	29.14	0.767	2.968	38.000	6.730	2.691	1.426	1.299	23.311	-3.254	4.630	101.051	1.560	44.107		
	76	38	15	2.50	3.16	4.031	34.65	0.912	2.932	38.000	7.847	3.100	1.395	1.269	27.720	-3.191	4.552	118.135	0.509	83.984		
	76	38	15	3.00	3.70	4.713	39.47	1.039	2.894	38.000	8.755	3.417	1.363	1.238	31.578	-3.127	4.473	132.774	0.511	141.390		
C100X50X15	100	50	15	2.00	3.26	4.268	67.49	1.350	3.977	50.000	14.500	0.300	1.843	1.613	53.994	-4.030	5.954	332.361	0.542	56.907		
	100	50	15	2.50	4.01	5.231	81.26	1.625	3.941	50.000	17.149	0.354	1.811	1.580	65.009	-3.965	5.876	394.908	0.545	108.984		
	100	50	15	3.00	4.82	6.153	93.82	1.876	3.905	50.000	19.429	0.401	1.777	1.548	75.053	-3.899	5.797	450.815	0.548	184.590		
C120X60X15	120	60	15	2.00	3.96	5.068	117.24	1.954	4.810	60.000	24.158	0.416	2.183	1.870	93.789	-4.667	7.049	749.930	0.562	67.573		
	120	60	15	2.50	4.80	6.231	142.05	2.367	4.775	60.000	28.794	0.495	2.150	1.837	113.638	-4.602	6.971	898.675	0.564	129.818		
	120	60	15	3.00	5.76	7.353	165.10	2.752	4.738	60.000	32.894	0.565	2.115	1.803	132.076	-4.536	6.892	1034.375	0.567	220.590		
C150X50X15	150	50	15	2.00	4.13	5.268	174.80	2.331	5.760	75.000	16.607	0.341	1.776	1.307	139.842	-3.464	6.952	789.819	0.752	70.240		
	150	50	15	2.50	4.88	6.481	211.90	2.825	5.718	75.000	19.670	0.404	1.742	1.276	169.517	-3.402	6.887	945.929	0.755	135.026		
	150	50	15	3.00	5.74	7.653	246.39	3.285	5.674	75.000	22.318	0.458	1.708	1.245	197.111	-3.339	6.802	1087.669	0.759	229.590		
C160X60X15	160	60	15	2.00	4.62	5.868	228.73	2.859	6.243	80.000	26.574	0.455	2.128	1.615	182.987	-4.204	7.822	1400.735	0.711	78.240		
	160	60	15	2.50	5.50	7.231	278.26	3.478	6.203	80.000	31.702	0.543	2.094	1.583	222.605	-4.140	7.746	1686.584	0.714	150.651		
	160	60	15	3.00	6.47	8.553	324.76	4.060	6.162	80.000	36.249	0.620	2.059	1.550	259.809	-4.076	7.670	1949.778	0.718	256.590		
C203X64X19	203	64	19	2.00	5.45	7.048	428.74	4.224	7.799	101.500	36.908	0.592	2.288	1.649	342.991	-4.388	9.237	3162.192	0.774	93.973		
	203	64	19	2.50	6.57	8.706	523.83	5.161	7.757	101.500	44.294	0.710	2.256	1.618	419.067	-4.326	9.164	3824.859	0.777	181.380		
	203	64	19	3.00	7.75	10.323	614.15	6.051	7.713	101.500	50.973	0.817	2.222	1.587	491.323	-4.265	9.090	4441.611	0.780	309.690		
C220X80X19	220	80	19	2.00	6.33	8.028	594.93	5.408	8.609	110.000	65.255	0.838	2.851	2.132	475.941	-5.554	10.634	6376.184	0.727	107.040		
	220	80	19	2.50	7.57	9.931	729.15	6.629	8.569	110.000	78.822	1.012	2.817	2.100	583.320	-5.491	10.560	7750.761	0.730	206.901		
	220	80	19	3.00	8.93	11.793	881.73	7.797	8.528	110.000	91.322	1.172	2.783	2.058	686.108	-5.427	10.484	9045.587	0.732	353.790		
C250X75X25	250	75	25	2.00	6.95	8.668	797.46	6.380	9.592	125.000	64.850	0.888	2.735	1.966	637.968	-5.246	11.269	8534.219	0.783	115.573		
	250	75	25	2.50	8.34	10.737	978.54	7.828	9.549	125.000	78.450	1.074	2.704	1.936	782.835	-5.185	11.197	10378.155	0.786	223.568		
	250	75	25	3.00	9.83	12.753	1152.39	9.219	9.506	125.000	91.038	1.245	2.672	1.906	921.912	-5.125	11.125	12116.384	0.788	382.590		
C254X64X19	254	64	19	2.00	6.33	8.068	731.72	5.762	9.523	127.000	39.329	0.629	2.208	1.440	585.377	-3.975	10.553	5195.859	0.858	107.573		
	254	64	19	2.50	7.57	9.981	896.16	7.056	9.475	127.000	47.206	0.754	2.175	1.411	716.929	-3.916	10.481	6298.555	0.860	207.943		
	254	64	19	3.00	9.13	11.853	1053.28	8.294	9.427	127.000	54.331	0.868	2.141	1.383	842.622	-3.858	10.408	7329.422	0.863	355.590		
C305X64X19	305	64	19	2.00	7.18	9.088	1139.68	7.473	11.198	152.500	41.207	0.657	2.129	1.278	911.743	-3.584	11.966	7835.540	0.907	121.173		
	305	64	19	2.50	8.62	11.256	1398.36	9.170	11.146	152.500	49.458	0.788	2.096	1.252	1118.685	-3.528	11.894	9511.057	0.909	234.505		
	305	64	19	3.00	10.25	13.383	1646.62	10.798	11.092	152.500	56.921	0.907	2.062	1.225	1317.300	-3.417	11.821	11081.715	0.911	401.490		
C305X64X19	305	64	19	4.00	13.45	17.512	2112.11	13.850	10.982	152.500	69.551	1.107	1.993	1.170	1689.686	-4.833	11.673	13923.643	0.914	933.973		
	305	80	19	2.00	7.65	9.728	1286.57	8.437	11.500	152.500	71.630	0.916	2.714	1.759	1029.259	-4.833	12.766	13255.200	0.857	129.707		
	305	80	19	2.50	9.40	12.056	1581.37	10.370	11.453	152.500	86.539	1.106	2.679	1.730	1265.095	-4.773	12.694	16156.572	0.859	251.172		
C305X80X19	305	80	19	3.00	10.90	14.343	1865.51	12.233	11.405	152.500	100.284	1.281	2.644	1.700	1492.411	-4.714	12.620	18904.394	0.861	430.290		
	305	80	19	4.00	14.42	18.792	2402.03	15.751	11.306	152.500	124.361	1.587	2.572	1.640	1921.625	-4.594	12.472	23959.530	0.864	1002.240		
	355	110	25	2.00	9.63	12.168	2285.59	12.877	13.705	177.500	181.505	1.691	3.862	2.693	1828.472	-7.172	15.943	45091.189	0.798	162.240		
C355X110X25	355	110	25	2.50	11.71	15.106	2819.81	15.886	13.663	177.500	221.408	2.063	3.828	2.662	2255.845	-7.110	15.871	55287.300	0.799	314.714		
	355	110	25	3.00	13.79	18.003	3339.25	18.813	13.619	177.500	259.169	2.414	3.794	2.631	2671.404	-7.048	15.797	65078.337	0.801	540.090		
	355	110	25	4.00	18.33	23.672	4334.06	24.417	13.531	177.500	328.359	3.056	3.724	2.569	3467.250	-6.925	15.650	83491.020	0.804	1262.507		
C400X85X25	400	85	25	2.00	9.63	12.068	2633.77	13.169	14.773	200.000	99.674	1.197	2.874	1.743	2107.013	-4.925	15.835	32241.509	0.903	160.907		
	400	85	25	2.50	11.80	14.981	3246.88	16.234	14.722	200.000	120.938	1.452	2.841	1.716	2597.505	-4.869	15.764	39420.970	0.905	312.109		
	400	85	25	3.00	13.80	17.853	3841.98	19.210	14.670	200.000	140.782	1.692	2.808	1.689	3073.586	-4.813	15.692	46268.531	0.906	535.590		
C400X85X25	400	85	25	4.00	18.33	23.472	4978.38	24.892	14.564	200.000	176.298	2.115	2.741	1.634	3982.701	-4.701	15.547	59005.543	0.909	1251.840		
	450	85	25	2.00	10.47	13.068	3510.54	15.602	16.390	225.000	102.479	1.229	2.800	1.609	2808.434	-4.639	17.263	42038.309	0.928	174.240		
	450	85	25	2.50	12.74	16.231	4331.34	19.250	16.336	225.000	124.334	1.491	2.768	1.584	3465.075	-4.585	17.191	51427.182	0.929	338.151		
C450X85X25	450	85	25	3.00	15.02	19.353	5129.54	22.798	16.280	225.000	144.727	1.734	2.735	1.558	4103.635	-4.535	17.119	60391.903	0.930	580.590		
	450	85	25	4.00	19.96	25.472	6658.40	29.593	16.168	225.000	181.221	2.170	2.667	1.506	5326.717	-4.424	16.973	77093.752	0.932	1358.507		

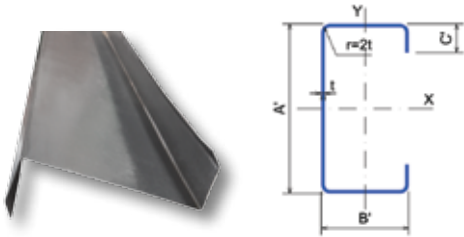
mayores ó iguales a 2.00 mm. Esfuerzo de Fluencia mínimo Fy=3.500 Kg/cm2 (50.000 psi) (350 Mpa)
Fu=4.368Kg/cm2 (62.400 psi) (437 Mpa). Elongación 2" del 21%.



5 PERFILES ESTRUCTURALES ABIERTOS C Y Z
NEGROS Y GALVANIZADOS

SECCION C

PERFILES C NEGROS Y GALVANIZADOS GRADO 36



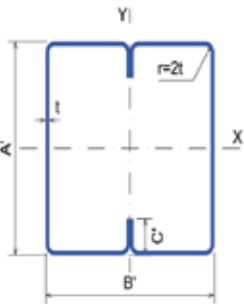
CODIGO	MIEMBRO							PROPIEDADES SECCION BRUTA												PROPIEDADES TORSIONALES			
	ALMA (mm)	ALA (mm)	PESTA- ÑA (mm)	ESPE- SOR (mm)	PESO NE- GRO	PESO GAL- VANI- ZADO	AREA (mm2)	Lx (cm4)	Sx (cm3)	Rx (cm)	Ycg (mm)	Ly (cm4)	Sy (cm3)	Ry (cm)	Xcg (cm)	Lx (cm4)	Xo (cm)	Ro (cm)	Cw (cm6)		Jv (cm)		
C76X38	76	38	15	1.10	1.47	-	1.902	17.45	0.459	3.029	38.000	4.164	1.702	1.480	1.354	13.961	-3.368	4.765	62.973	0.501	7.670		
				1.20	-	1.62	2.064	18.86	0.496	3.023	38.000	4.485	1.829	1.474	1.348	15.091	-3.355	4.750	67.730	0.501	9.910		
				1.50	1.98	2.01	2.543	22.93	0.603	3.003	38.000	5.395	2.184	1.456	1.330	18.344	-3.317	4.705	81.174	0.503	19.074		
				1.90	2.47	2.52	3.158	27.95	0.736	2.975	38.000	6.481	2.598	1.432	1.306	22.363	-3.267	4.645	97.312	0.505	38.006		
				2.30	2.96	2.64	3.747	32.53	0.856	2.946	38.000	7.426	2.948	1.408	1.281	26.023	-3.216	4.583	111.613	0.508	66.071		
C100X50	100	50	15	1.10	1.81	-	2.430	39.61	0.792	4.038	50.000	8.766	2.633	1.899	1.670	31.686	-4.146	6.091	200.780	0.537	9.799		
				1.20	-	2.00	2.640	42.90	0.858	4.031	50.000	9.466	2.837	1.893	1.664	34.324	-4.133	6.076	216.722	0.537	12.674		
				1.50	2.41	2.47	3.263	52.50	1.050	4.011	50.000	11.470	3.419	1.875	1.645	41.998	-4.094	6.030	262.493	0.539	24.474		
				1.90	3.07	3.13	4.070	64.59	1.292	3.984	50.000	13.925	4.119	1.850	1.619	51.674	-4.043	5.969	318.998	0.541	48.980		
				2.30	3.52	3.58	4.851	75.90	1.518	3.956	50.000	16.135	4.736	1.824	1.593	50.720	-3.991	5.907	370.721	0.544	85.538		
C120X60	120	60	15	1.10	2.24	-	2.870	68.08	1.135	4.871	60.000	14.419	3.542	2.242	1.929	54.460	-4.785	7.187	445.759	0.557	11.574		
				1.20	-	2.48	3.120	73.83	1.230	4.864	60.000	15.591	3.824	2.235	1.922	59.061	-4.772	7.171	482.047	0.557	14.978		
				1.50	2.97	3.02	3.863	90.64	1.511	4.844	60.000	18.971	4.630	2.216	1.903	72.515	-4.733	7.126	587.064	0.559	28.974		
				1.90	3.74	3.81	4.830	112.06	1.868	4.817	60.000	23.165	5.618	2.190	1.877	89.649	-4.681	7.064	718.524	0.561	58.125		
				2.30	4.34	4.41	5.771	132.34	2.206	4.789	60.000	27.005	6.507	2.163	1.850	105.869	-4.628	7.002	840.798	0.563	101.761		
C150X50	150	50	15	1.10	2.33	-	2.980	101.42	1.352	5.834	75.000	10.017	2.753	1.834	1.362	81.133	-3.575	7.084	469.392	0.745	12.018		
				1.20	-	2.58	3.240	109.99	1.467	5.826	75.000	10.819	2.969	1.827	1.356	87.995	-3.563	7.069	507.655	0.746	15.554		
				1.50	3.05	3.12	4.013	135.09	1.801	5.802	75.000	13.120	3.582	1.808	1.337	108.071	-3.526	7.026	618.358	0.748	30.099		
				1.90	3.88	3.95	5.020	167.07	2.228	5.769	75.000	15.944	4.324	1.782	1.313	133.657	-3.476	6.967	756.789	0.751	60.412		
				2.30	4.49	4.55	6.001	197.37	2.632	5.735	75.000	18.495	4.983	1.756	1.288	157.898	-3.427	6.907	885.261	0.754	105.816		
C160X60	160	60	15	1.10	2.58	-	3.310	131.92	1.649	6.313	80.000	15.838	3.660	2.188	1.673	105.532	-4.319	7.956	824.548	0.705	13.349		
				1.20	-	2.90	3.600	143.16	1.790	6.306	80.000	17.128	3.952	2.181	1.666	114.531	-4.306	7.941	892.706	0.706	17.282		
				1.50	3.42	3.50	4.463	176.17	2.202	6.283	80.000	20.852	4.790	2.161	1.647	140.937	-4.268	7.897	1090.838	0.708	33.474		
				1.90	4.34	4.42	5.590	218.47	2.731	6.251	80.000	25.477	5.819	2.135	1.621	174.772	-4.217	7.837	1340.728	0.710	67.271		
				2.30	5.06	5.14	6.691	251.81	3.235	6.219	80.000	29.721	6.718	2.108	1.596	207.049	-4.166	7.777	1575.037	0.713	117.983		
C203X64	203	64	19	1.10	3.00	-	3.959	245.44	2.413	7.878	101.500	21.783	4.638	2.340	1.703	196.349	-4.498	9.367	1845.743	0.769	15.966		
				1.20	-	3.37	4.308	266.58	2.626	7.866	101.500	23.581	5.014	2.339	1.697	213.262	-4.486	9.352	2000.240	0.770	20.681		
				1.50	4.06	4.16	5.348	328.84	3.240	7.841	101.500	28.799	6.100	2.321	1.697	263.070	-4.449	9.309	2451.168	0.772	40.112		
				1.90	5.12	5.21	6.711	409.14	4.031	7.808	101.500	35.344	7.448	2.295	1.655	327.315	-4.400	9.251	3023.938	0.774	80.760		
				2.30	6.04	6.14	8.048	486.37	4.792	7.774	101.500	41.426	8.685	2.269	1.630	389.096	-4.351	9.193	3565.434	0.776	141.912		
C220X80	220	80	19	1.10	3.44	-	4.498	338.76	3.080	8.679	110.000	38.096	6.556	2.910	2.189	271.009	-5.688	10.767	3688.779	0.723	18.140		
				1.20	-	3.87	4.896	368.15	3.347	8.671	110.000	41.290	7.098	2.904	2.183	294.523	-5.656	10.752	4001.488	0.723	23.503		
				1.50	4.67	4.79	6.083	454.93	4.136	8.648	110.000	50.606	8.671	2.884	2.164	363.947	-5.618	10.708	4918.106	0.725	45.624		
				1.90	5.94	6.05	7.642	567.39	5.158	8.616	110.000	62.412	10.647	2.858	2.138	453.913	-5.567	10.649	6091.374	0.727	91.963		
				2.30	6.96	7.07	9.175	676.15	6.147	8.585	110.000	73.524	12.488	2.831	2.112	540.921	-5.516	10.590	7210.703	0.729	161.785		
C250X75	250	75	25	1.50	5.14	5.27	6.563	609.10	4.873	9.634	125.000	50.222	9.123	2.766	1.995	487.280	-5.306	11.341	6579.766	0.781	49.224		
				1.90	6.54	6.64	8.250	760.37	6.083	9.600	125.000	62.007	11.216	2.741	1.972	608.297	-5.258	11.284	8152.330	0.783	99.279		
				2.30	7.66	7.78	9.911	906.98	7.256	9.566	125.000	73.132	13.172	2.716	1.948	725.585	-5.209	11.226	9653.528	0.785	174.753		
C254X64	254	64	19	1.50	4.67	4.79	6.113	559.92	4.409	9.570	127.000	30.685	6.223	2.240	1.469	447.938	-4.033	10.624	4018.172	0.856	45.849		
				1.90	5.92	6.03	7.680	697.95	5.496	9.533	127.000	37.662	7.602	2.214	1.446	558.361	-3.987	10.567	4966.426	0.858	92.420		
				2.30	6.96	7.07	9.221	831.27	6.545	9.495	127.000	44.147	8.870	2.188	1.423	665.013	-3.940	10.510	5866.268	0.859	162.596		
C305X64	305	64	19	1.50	5.30	5.42	6.878	870.55	5.709	11.250	152.500	32.152	6.311	2.162	1.305	696.440	-3.695	12.037	6051.097	0.906	51.587		
				1.90	6.72	6.84	8.649	1086.69	7.126	11.209	152.500	39.461	7.713	2.136	1.284	869.353	-3.651	11.980	7487.499	0.907	104.081		
				2.30	7.93	8.05	10.394	1296.14	8.499	11.167	152.500	46.253	9.003	2.110	1.262	1036.910	-3.606	11.923	8853.656	0.908	183.280		
C305X80	305	80	19	1.50	5.65	5.79	7.358	981.08	6.433	11.547	152.500	55.540	8.942	2.747	1.789	784.868	-4.892	12.838	10194.833	0.855	55.187		
				1.90	7.18	7.31	9.257	1226.33	8.042	11.510	152.500	68.507	10.988	2.720	1.765	981.066	-4.844	12.780	12656.026	0.856	111.397		
				2.30	8.65	8.78	11.130	1464.73	9.605	11.472	152.500	80.716	12.897	2.693	1.741	1171.785	-4.797	12.723	15014.747	0.858	196.258		
C355X110	355	110	25	1.90	9.03	9.20	11.575	2176.97	12.265	13.714	177.500	173.250	20.873	3.869	2.699	1741.576	-7.184	15.958	43002.289	0.797	139.290		
				2.30	10.76	10.93	13.936	2607.89	14.692	13.680	177.500	205.705	24.707	3.842	2.674	2086.315	-7.135	15.900	51258.137	0.799	245.737		

Los perfiles de sección abierta cumplen con la norma NTC 5685, ASTM A-1011 Grado 36. Para espesores menores o iguales a 1.50 mm. Esfuerzo de Fluencia mínimo $F_y=2.530 \text{ Kg/cm}^2$ (36.000 psi) (253 Mpa) $F_u=3.866 \text{ Kg/cm}^2$ (55.000 psi) (387 Mpa). Elongación 2" del 21%.

TOLERANCIAS

5 PERFILES ESTRUCTURALES ABIERTOS C Y Z
NEGROS Y GALVANIZADOS

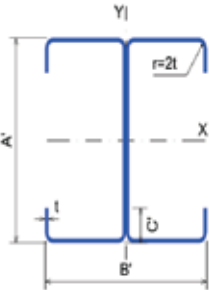
SECCION CC



PERFILES NEGROS SECCION DOBLE
GRADO 50

CODIGO	MIEMBRO						PROPIEDADES EJE X-X				PROPIEDADES EJE Y-Y TIPO CAJON			PROPIEDADES EJE Y-Y TIPO "I"			PROPIEDADES TORSIONALES		
	ALMA (mm)	ALA (mm)	PESTAÑA (mm)	ESPE-SOR (mm)	PESO NEGRO	AREA (mm²)	Lx (cm⁴)	Sx (cm³)	Rx (cm)	Ycg (mm)	Ly (cm⁴)	Sy (cm³)	Ry (cm)	Ly (cm⁴)	Sy (cm³)	Ry (cm)	Ro (cm)	Cw (cm⁵)	Jv (cm)
CC100x50x2	100	100	15	2,00	39,09	8,536	134,99	27,00	3,98	50,00	126,94	25,39	3,86	51,20	10,24	1,01	5,95	664,72	113,81
CC100x50x2.5	100	100	15	2,50	48,15	10,463	162,52	32,50	3,94	50,00	156,64	31,33	3,87	60,43	12,09	1,10	5,88	789,82	217,97
CC100x50x3	100	100	15	3,00	57,79	12,306	187,63	37,53	3,90	50,00	185,50	37,10	3,88	68,34	13,67	1,17	5,80	901,63	369,18
CC120x60x2	120	120	15	2,00	47,54	10,136	234,47	39,08	4,81	60,00	221,20	36,87	4,67	83,76	13,96	1,18	7,05	1499,86	135,15
CC120x60x2.5	120	120	15	2,50	57,55	12,463	284,10	47,35	4,77	60,00	273,58	45,60	4,69	99,64	16,61	1,29	6,97	1797,35	259,64
CC120x60x3	120	120	15	3,00	69,06	14,706	330,19	55,03	4,74	60,00	324,77	54,13	4,70	113,62	18,94	1,38	6,89	2068,75	441,18
CC150x50x2	150	100	15	2,00	49,58	10,536	349,61	46,61	5,76	75,00	176,94	35,39	4,10	51,20	10,24	0,83	6,95	1579,64	140,48
CC150x50x2.5	150	100	15	2,50	58,56	12,963	423,79	56,51	5,72	75,00	219,14	43,83	4,11	60,43	12,09	0,90	6,88	1891,86	270,05
CC150x50x3	150	100	15	3,00	68,92	15,306	492,78	65,70	5,67	75,00	260,50	52,10	4,13	68,34	13,67	0,95	6,80	2175,34	459,18
CC160x60x2	160	120	15	2,00	55,45	11,736	457,47	57,18	6,24	80,00	278,80	46,47	4,87	83,76	13,96	1,02	7,82	2801,47	156,48
CC160x60x2.5	160	120	15	2,50	65,95	14,463	556,51	69,56	6,20	80,00	345,58	57,60	4,89	99,64	16,61	1,12	7,75	3373,17	301,30
CC160x60x3	160	120	15	3,00	77,66	17,106	649,52	81,19	6,16	80,00	411,17	68,53	4,90	113,62	18,94	1,19	7,67	3899,56	513,18
CC203x64x2	203	128	19	2,00	65,41	14,096	857,48	84,48	7,80	101,50	392,05	61,26	5,27	112,12	17,52	1,05	9,24	6324,38	187,95
CC203x64x2.5	203	128	19	2,50	78,83	17,413	1047,67	103,22	7,76	101,50	486,76	76,06	5,29	134,18	20,97	1,15	9,16	7649,72	362,76
CC203x64x3	203	128	19	3,00	93,00	20,646	1228,31	121,02	7,71	101,50	580,11	90,64	5,30	153,98	24,06	1,23	9,09	8883,22	619,38
CC220x80x2	220	160	19	2,00	75,97	16,056	1189,85	108,17	8,61	110,00	683,43	85,43	6,52	203,47	25,43	1,36	10,63	12752,37	214,08
CC220x80x2.5	220	160	19	2,50	90,89	19,863	1458,30	132,57	8,57	110,00	849,13	106,14	6,54	245,21	30,65	1,49	10,56	15501,52	413,80
CC220x80x3	220	160	19	3,00	107,19	23,586	1715,27	155,93	8,53	110,00	1012,74	126,59	6,55	283,46	35,43	1,61	10,48	18091,17	707,58
CC250x75x2	250	150	25	2,00	83,39	17,336	1594,92	127,59	9,59	125,00	660,69	88,09	6,17	196,68	26,22	1,25	11,27	17068,44	231,15
CC250x75x2.5	250	150	25	2,50	100,04	21,463	1957,09	156,57	9,55	125,00	821,34	109,51	6,19	237,34	31,65	1,38	11,20	20756,31	447,14
CC250x75x3	250	150	25	3,00	118,01	25,506	2304,78	184,38	9,51	125,00	980,15	130,69	6,20	274,76	36,63	1,48	11,12	24232,77	765,18
CC254x64x2	254	128	19	2,00	75,97	16,136	1463,44	115,23	9,52	127,00	475,61	74,31	5,43	112,12	17,52	0,94	10,55	10391,72	215,15
CC254x64x2.5	254	128	19	2,50	90,78	19,963	1792,32	141,13	9,48	127,00	591,21	92,38	5,44	134,18	20,97	1,03	10,48	12597,11	415,89
CC254x64x3	254	128	19	3,00	109,54	23,706	2106,56	165,87	9,43	127,00	705,45	110,23	5,46	153,98	24,06	1,10	10,41	14658,84	711,18
CC305x64x2	305	128	19	2,00	86,10	18,176	2279,36	149,47	11,20	152,50	559,17	87,37	5,55	112,12	17,52	0,86	11,97	15671,08	242,35
CC305x64x2.5	305	128	19	2,50	103,44	22,513	2796,71	183,39	11,15	152,50	695,65	108,70	5,56	134,18	20,97	0,94	11,89	19022,11	469,01
CC305x64x3	305	128	19	3,00	123,05	26,766	3293,25	215,95	11,09	152,50	830,79	129,81	5,57	153,98	24,06	1,00	11,82	22163,43	802,98
CC305x64x4	305	128	19	4,00	161,34	35,024	4224,22	277,00	10,98	152,50	1096,96	171,40	5,60	187,08	29,23	1,11	11,67	27847,29	1867,95
CC305x80x2	305	160	19	2,00	91,80	19,456	2573,15	168,73	11,50	152,50	901,03	112,63	6,81	203,47	25,43	1,16	12,77	26510,40	259,41
CC305x80x2.5	305	160	19	2,50	112,81	24,113	3162,74	207,39	11,45	152,50	1121,13	140,14	6,82	245,21	30,65	1,27	12,69	32313,14	502,34
CC305x80x3	305	160	19	3,00	130,83	28,686	3731,03	244,66	11,40	152,50	1339,14	167,39	6,83	283,46	35,43	1,36	12,62	37808,79	860,58
CC305x80x4	305	160	19	4,00	172,99	37,584	4804,06	315,02	11,31	152,50	1768,81	221,10	6,86	349,85	43,73	1,51	12,47	47919,06	2004,48
CC355x110x2	355	220	25	2,00	115,52	24,336	4571,18	257,53	13,71	177,50	2042,39	185,67	9,16	539,49	49,04	1,74	15,94	90182,38	324,48
CC355x110x2.5	355	220	25	2,50	140,46	30,213	5639,61	317,72	13,66	177,50	2543,29	231,21	9,17	656,90	59,72	1,92	15,87	110574,60	629,43
CC355x110x3	355	220	25	3,00	165,51	36,006	6678,51	376,25	13,62	177,50	3040,28	276,39	9,19	767,55	69,78	2,08	15,80	130156,67	1080,18
CC355x110x4	355	220	25	4,00	219,96	47,344	8668,12	488,35	13,53	177,50	4022,41	365,67	9,22	969,06	88,10	2,34	15,65	166982,04	2525,01
CC400x85x2	400	170	25	2,00	115,56	24,136	5267,53	263,38	14,77	200,00	1301,39	153,10	7,34	272,66	32,08	1,17	15,84	64483,02	321,81
CC400x85x2.5	400	170	25	2,50	141,65	29,963	6493,76	324,69	14,72	200,00	1620,94	190,70	7,36	330,08	38,83	1,28	15,76	78841,94	624,22
CC400x85x3	400	170	25	3,00	165,64	35,706	7683,97	384,20	14,67	200,00	1938,13	228,02	7,37	383,38	45,10	1,38	15,69	92537,06	1071,18
CC400x85x4	400	170	25	4,00	219,96	46,944	9956,75	497,84	14,56	200,00	2565,40	301,81	7,39	477,99	56,23	1,55	15,55	118011,09	2503,68
CC450x85x2	450	170	25	2,00	125,65	26,136	7021,08	312,05	16,39	225,00	1445,89	170,10	7,44	272,66	32,08	1,10	17,26	84076,62	348,48
CC450x85x2.5	450	170	25	2,50	152,83	32,463	8662,69	385,01	16,34	225,00	1801,56	211,95	7,45	330,08	38,83	1,21	17,19	102854,36	676,30
CC450x85x3	450	170	25	3,00	180,28	38,706	10259,09	455,96	16,28	225,00	2154,88	253,52	7,46	383,38	45,10	1,31	17,12	120783,81	1161,18
CC450x85x4	450	170	25	4,00	239,55	50,944	13316,79	591,86	16,17	225,00	2854,40	335,81	7,49	477,99	56,23	1,46	16,97	154187,50	2717,01

5 PERFILES ESTRUCTURALES ABIERTOS C Y Z NEGROS Y GALVANIZADOS



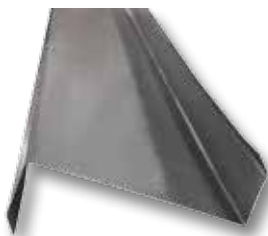
PERFILES NEGROS SECCION DOBLE GRADO 36

CODIGO	MIEMBRO						PROPIEDADES EJE X-X				PROPIEDADES Y-Y TIPO CAJON			PROPIEDADES EJE Y-Y TIPO "I"			PROPIEDADES TORSIONALES		
	ALMA (mm)	ALA (mm)	PESTA-NA (mm)	ESPE-SOR (mm)	PESO NEGRO	AREA (mm²)	Lx (cm⁴)	Sx (cm²)	Rx (cm)	Ycg (mm)	Ly (cm⁴)	Sy (cm²)	Ry (cm)	Ly (cm⁴)	Sy (cm²)	Ry (cm)	Ro (cm)	Cw (cm⁵)	Jv (cm)
CC100x50x1.9	100	100	15	1,90	6,14	8,141	129,18	25,837	3,984	50,000	120,899	24,180	3,854	49,192	9,838	0,992	5,969	637,995	97,960
CC100x50x2.3	100	100	15	2,30	7,25	9,702	151,80	30,360	3,956	50,000	144,857	28,971	3,864	56,903	11,381	1,067	5,907	741,442	171,076
CC120x60x1.9	120	120	15	1,90	7,48	9,661	224,12	37,354	4,817	60,000	210,585	35,098	4,669	80,351	13,392	1,157	7,064	1437,048	116,251
CC120x60x2.3	120	120	15	2,30	8,68	11,542	264,67	44,112	4,789	60,000	252,773	42,129	4,680	93,519	15,586	1,248	7,002	1681,596	203,521
CC150x50x1.5	150	100	15	1,50	3,05	8,027	270,18	36,024	5,802	75,000	133,915	26,783	4,085	40,596	8,119	0,736	7,026	1236,716	60,199
CC150x50x1.9	150	100	15	1,90	7,75	10,041	334,14	44,552	5,769	75,000	168,399	33,680	4,095	49,192	9,838	0,810	6,967	1513,578	120,824
CC150x50x2.3	150	100	15	2,30	8,97	12,002	394,74	52,633	5,735	75,000	202,357	40,471	4,106	56,903	11,381	0,871	6,907	1770,523	211,633
CC160x60x1.9	160	120	15	1,90	8,68	11,181	436,93	54,616	6,251	80,000	265,305	44,218	4,871	80,351	13,392	1,002	7,837	2681,455	134,542
CC160x60x2.3	160	120	15	2,30	10,12	13,382	517,62	64,703	6,219	80,000	319,013	53,169	4,883	93,519	15,586	1,081	7,777	3150,074	235,967
CC203x64x1.5	203	128	19	1,50	4,06	10,697	657,67	64,795	7,841	101,500	296,015	46,252	5,261	87,747	13,710	0,930	9,309	4902,336	80,224
CC203x64x1.9	203	128	19	1,90	10,23	13,423	818,29	80,619	7,808	101,500	372,953	58,274	5,271	107,436	16,787	1,029	9,251	6047,876	161,520
CC203x64x2.3	203	128	19	2,30	12,09	16,096	972,74	95,837	7,774	101,500	449,037	70,162	5,282	125,630	19,630	1,113	9,193	7130,869	283,824
CC220x80x1.5	220	160	19	1,50	4,67	12,167	909,87	82,715	8,648	110,000	515,651	64,456	6,510	158,164	19,770	1,199	10,708	9836,211	91,249
CC220x80x1.9	220	160	19	1,90	11,88	15,285	1134,78	103,162	8,616	110,000	650,042	81,255	6,521	194,697	24,337	1,330	10,649	12182,749	183,926
CC220x80x2.3	220	160	19	2,30	13,92	18,350	1352,30	122,937	8,585	110,000	783,104	97,888	6,533	228,936	28,617	1,443	10,590	14421,406	323,569
CC250x75x1.5	250	150	25	1,50	5,14	13,127	1218,20	97,456	9,634	125,000	498,215	66,429	6,161	152,698	20,360	1,105	11,341	13159,533	98,449
CC250x75x1.9	250	150	25	1,90	13,07	16,501	1520,74	121,659	9,600	125,000	628,338	83,778	6,171	188,154	25,087	1,227	11,284	16304,660	198,559
CC250x75x2.3	250	150	25	2,30	15,32	19,822	1813,96	145,117	9,566	125,000	757,296	100,973	6,181	221,473	29,530	1,331	11,226	19307,056	349,525
CC254x64x1.5	254	128	19	1,50	4,67	12,227	1119,85	88,177	9,570	127,000	358,684	56,044	5,416	87,747	13,710	0,831	10,624	8036,343	91,699
CC254x64x1.9	254	128	19	1,90	11,85	15,361	1395,90	109,914	9,533	127,000	452,333	70,677	5,427	107,436	16,787	0,920	10,567	9932,853	184,841
CC254x64x2.3	254	128	19	2,30	13,92	18,442	1662,53	130,908	9,495	127,000	545,129	85,176	5,437	125,630	19,630	0,995	10,510	11732,536	325,191
CC305x64x1.5	305	128	19	1,50	5,30	13,757	1741,10	114,170	11,250	152,500	421,353	65,836	5,534	87,747	13,710	0,759	12,037	12102,195	103,174
CC305x64x1.9	305	128	19	1,90	13,43	17,299	2173,38	142,517	11,209	152,500	531,714	83,080	5,544	107,436	16,787	0,839	11,980	14974,999	208,162
CC305x64x2.3	305	128	19	2,30	15,86	20,788	2592,27	169,985	11,167	152,500	641,222	100,191	5,554	125,630	19,630	0,908	11,923	17707,311	366,559
CC305x80x1.9	305	160	19	1,90	14,36	18,515	2452,67	160,831	11,510	152,500	856,762	107,095	6,803	194,697	24,337	1,130	12,780	25312,053	222,794
CC305x80x2.3	305	160	19	2,30	17,30	22,260	2929,46	192,096	11,472	152,500	1033,344	129,168	6,813	228,936	28,617	1,225	12,723	30029,493	392,516
CC355x110x1.9	355	220	25	1,90	18,06	23,151	4353,94	245,292	13,714	177,500	1941,737	176,522	9,158	515,185	46,835	1,704	15,958	86004,577	278,581
CC355x110x2.3	355	220	25	2,30	21,52	27,872	5215,79	293,847	13,680	177,500	2343,401	213,036	9,169	610,751	55,523	1,855	15,900	102516,274	491,474

5

PERFILES ESTRUCTURALES ABIERTOS C Y Z
NEGROS Y GALVANIZADOS

SECCION Z
CORREAS



Los perfiles Z, se fabrican a partir de bandas de acero estructural laminado en caliente, bajo un proceso debidamente normalizado mediante un estricto control de calidad, en cumplimiento con la Norma ASTM a 1011 Grado 42/50.

PERFILES Z NEGROS Y GALVANIZADOS
GRADO 36 Y 50

A"	B"	C"	t	r	PESO NEGRO Y GALV.	AREA (cm2)	EJE X-X			EJE Y-Y			ixy	Ix ₂	Iy ₂	r _{min}	c _w	J	q
							Lx (cm4)	Sx (cm3)	Rx (cm)	Ly (cm4)	Sy (cm3)	Ry (cm)							
150	69	27	1,501	2,25	3,95	5,02	184,82	24,64	6,07	79,35	11,50	3,97	91,14	26,79	237,38	2,31	2893,02	0,04	60,03
			2,00	3,00	5,23	6,65	242,58	32,34	6,04	104,18	15,10	3,96	119,85	34,98	311,78	2,29	3745,72	0,09	60,00
			2,50	3,75	6,50	8,26	298,44	39,79	6,01	128,22	18,58	3,94	147,76	42,81	383,85	2,28	4546,27	0,17	59,97
			3,00	4,50	7,74	9,84	352,42	46,99	5,99	151,49	21,95	3,92	174,87	50,28	453,63	2,26	5296,79	0,30	59,94
200	69	27	1,502	2,25	4,54	5,77	359,20	35,92	7,89	79,35	11,50	3,71	123,87	32,40	406,16	2,37	5439,37	0,04	69,24
			2,00	3,00	6,02	7,65	472,60	47,26	7,86	104,18	15,10	3,69	163,05	42,38	534,40	2,35	7067,61	0,10	69,24
			2,50	3,75	7,48	9,51	582,87	58,29	7,83	128,22	18,58	3,67	201,21	51,97	659,13	2,34	8608,62	0,20	69,24
			3,00	4,50	8,92	11,34	690,04	69,00	7,80	151,49	21,95	3,66	238,34	61,15	780,37	2,32	10065,45	0,34	69,24
250	79	32	1,503	2,25	5,49	6,97	668,20	53,46	9,79	123,05	15,58	4,20	208,26	52,59	738,65	2,75	13499,63	0,05	71,31
			2,00	3,00	7,28	9,25	881,20	70,50	9,76	161,90	20,49	4,18	274,66	69,01	974,09	2,73	17618,10	0,12	71,32
			2,50	3,75	9,05	11,51	1089,39	87,15	9,73	199,68	25,28	4,17	339,58	84,88	1204,19	2,72	21554,79	0,24	71,32
			3,00	4,50	10,81	13,74	1292,80	103,42	9,70	236,42	29,93	4,15	403,04	100,21	1429,00	2,70	25314,91	0,41	71,33
300	79	32	2,00	3,00	8,07	10,25	1353,99	90,27	11,49	161,90	20,49	3,97	332,67	75,35	1440,54	2,71	26331,91	0,14	75,42
			2,50	3,75	10,04	12,76	1675,72	111,71	11,46	199,68	25,28	3,96	411,44	92,74	1782,66	2,70	32263,08	0,27	75,43
			3,00	4,50	11,99	15,24	1990,81	132,72	11,43	236,42	29,93	3,94	488,51	109,57	2117,66	2,68	37947,02	0,46	75,44

Los perfiles de sección abierta cumplen con la norma NTC 5685, ASTM A-1011 Grado 50. Para espesores mayores ó iguales a 2.00 mm. Esfuerzo de Fluencia mínimo Fy=3.500 Kg/cm2 (50.000 psi) (350 Mpa) Fu=4.368Kg/cm2 (62.400 psi) (437 Mpa). Para espesores menores ó iguales a 1.50 mm. Esfuerzo de Fluencia mínimo Fy=2.530 Kg/cm2 (36.000 psi) (253 Mpa) Fu=3.866 Kg/cm2 (55.000 psi) (387 Mpa). Elongación 2" del 21%.

TOLERANCIAS

LONGITUD	ESPESOR	DIMENSIONES EXTERIORES	CUADRATURA	SEPARACION DE PERFORACION
-0 +10 mm	+/- 5%	+/- 3mm	+/- 3 grados	+/- 3mm

CARACTERISTICAS DE LOS MATERIALES

TIPO DE ACABADO	NEGRO O PINTADO	GALVANIZADO
Grado del Acero	50	50
Designación del Acero	Acero Estructural	50
Especificación	ASTM A1011	50
Resistencia a la Fluencia (Fy)	345 Mpa	345 Mpa
Resistencia Ultima (Fu)	420 Mpa	420 Mpa
Modulo de Elasticidad	200 Mpa	200 Mpa

