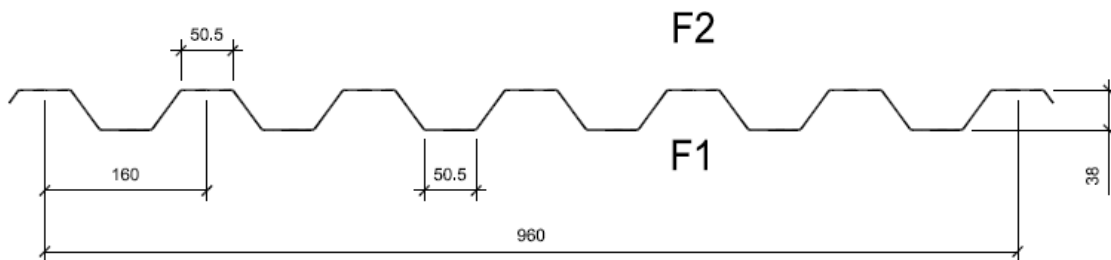


TECHNICAL DATA SHEET
OF PROFILE
Trapeza[®] 40S/160 T

Trapeza® 40S/160 T



Technical parameters:

Coil width:	1250 mm
Profile width:	960 mm
Yield strength:	S320GD, S350GD according to EN 10346
Thickness:	0,40; 0,50; 0,60; 0,63; 0,70; 0,75; 0,80; 0,88; 1,00; 1,25 mm acc. to EN 10143
Durability/Coating quality:	ZM 60, ZM80, ZM100, ZM120, ZM175, ZM275 and Z100, 140, 200, 225, 275, 350 acc. to EN 10346
Organic coating:	Interieur (DU912, DU901), Hairplus, Hairultra, Hairflon, Keyron, Hairexcel, Sinea, (or acc. to Material guide), acc. to EN 10169
Max. length:	15 m
Min. length:	2 m



Product is in conformity with the provisions of EC Directive 89/106/EEC (Construction Products Directive) and that the harmonized standard referenced below has been applied: EN 14782:2006

Tables of resistance of profiled sheeting ArcelorMittal

For all profiles, steel S320 is used. Material characteristics are as follows:

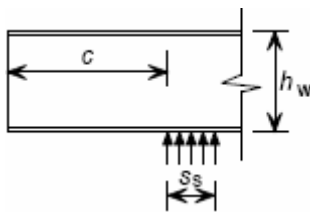
- yield strength $f_y = 320$ MPa
- proof strength $f_u = 390$ MPa
- modulus of elasticity $E = 210\,000$ MPa
- density 7850 kg/m³

The design thickness of the sheet given in the tables is the core thickness only. No coatings or paintings are included neither in the thickness nor in the calculated weight of the profiled sheeting. Minus tolerance in the sheet thickness is lower than 5 %.

The design resistances are calculated for uniformly loaded simply supported or continuous beams (where the spans are also uniform).

Ultimate limit state (ULS)

The design resistance according to the ultimate limit state is given by " q_{Ed} " which is calculated with respect to the bending resistance, shear resistance, local transverse forces and their interactions as defined in CSN EN 1993-1-3 and other referenced codes. The width of the end support s_s is 40 mm and 120 mm for the internal support respectively. In the tables, two different resistances are given according to the distance " c " (see figure below the paragraph) from the end support to the free end. One resistance " $q_{Ed} (c < 1,5h)$ " is for profiles which meets the minimal distance of the overhang " c " at least 40 mm. For the second resistance " $q_{Ed} (c \geq 1,5h)$ ", the distance at least $1.5 \times h_w$ (web height) clear from a free end is considered.



The real design load must be always smaller or at least equal to the resistance given in the tables. The maximal design resistances (load values) in the tables are related to a one-meter width of the profiled sheeting. Units used in the tables are kN/m². The self-weight of the sheeting must be included in the load.

Serviceability limit state (SLS)

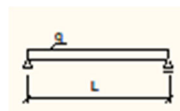
The characteristics load " q_{Ek} " that meets the serviceability limit for deflection of $L/200$ (where L means the span) is given in the table. In view of the fact that the behavior in the SLS is elastic, characteristic load for different limits may be extrapolated from the table. To fulfil the condition of the limit, the real characteristics load must be lower or at least equal to the value given by the tables.

Used design codes:

ČSN EN 1993-1-1: Navrhování ocelových konstrukcí, Část 1-1: Obecná pravidla a pravidla pro pozemní stavby, ČNI, 2006. (Design of steel structures, Part 1-1: General rules and rules for buildings)

ČSN EN 1993-1-3: Navrhování ocelových konstrukcí, Část 1-3: Obecná pravidla – Doplnující pravidla pro tenkostěnné za studena tvarované prvky a plošné profily, ČNI, 2008. (Design of steel structures, Part 1-3: General rules - Supplementary rules for cold-formed members and sheeting)

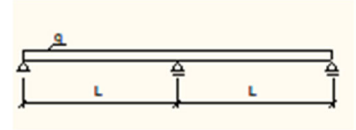
ČSN EN 1993-1-5: Navrhování ocelových konstrukcí, Část 1-5: Boulení stěn, ČNI, 2008. (Design of steel structures, Part 1-5: Plated structural elements)



Single span – symmetric profile

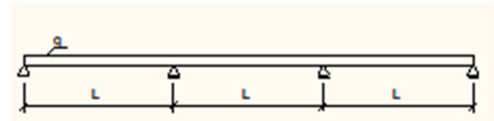
Trapeza® 40S/160 T		Span [m]															
t [mm]	S320	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00
0,4	$q_{rel} (<1.5h)$	3,741	2,743	2,015	1,543	1,219	0,987	0,816	0,686	0,584	0,504	0,439	0,386	0,342	0,305	0,274	0,247
	$q_{rel} (>1.5h)$	3,950	2,743	2,015	1,543	1,219	0,987	0,816	0,686	0,584	0,504	0,439	0,386	0,342	0,305	0,274	0,247
	$q_{rel} (L/200)$	2,519	1,458	0,918	0,615	0,432	0,315	0,237	0,182	0,143	0,115	0,093	0,077	0,064	0,054	0,046	0,039
0,5	$q_{rel} (<1.5h)$	5,984	4,362	3,205	2,454	1,939	1,570	1,298	1,091	0,929	0,801	0,698	0,613	0,543	0,485	0,435	0,393
	$q_{rel} (>1.5h)$	6,282	4,362	3,205	2,454	1,939	1,570	1,298	1,091	0,929	0,801	0,698	0,613	0,543	0,485	0,435	0,393
	$q_{rel} (L/200)$	3,748	2,169	1,366	0,915	0,643	0,469	0,352	0,271	0,213	0,171	0,139	0,114	0,095	0,080	0,068	0,059
0,6	$q_{rel} (<1.5h)$	8,696	6,329	4,650	3,560	2,813	2,279	1,883	1,582	1,348	1,163	1,013	0,890	0,788	0,703	0,631	0,570
	$q_{rel} (>1.5h)$	9,114	6,329	4,650	3,560	2,813	2,279	1,883	1,582	1,348	1,163	1,013	0,890	0,788	0,703	0,631	0,570
	$q_{rel} (L/200)$	5,123	2,965	1,867	1,251	0,878	0,640	0,481	0,371	0,291	0,233	0,190	0,156	0,130	0,110	0,093	0,080
0,63	$q_{rel} (<1.5h)$	9,598	6,857	5,037	3,857	3,047	2,468	2,040	1,714	1,461	1,259	1,097	0,964	0,854	0,762	0,684	0,617
	$q_{rel} (>1.5h)$	9,873	6,857	5,037	3,857	3,047	2,468	2,040	1,714	1,461	1,259	1,097	0,964	0,854	0,762	0,684	0,617
	$q_{rel} (L/200)$	5,501	3,183	2,005	1,343	0,943	0,688	0,517	0,398	0,313	0,251	0,204	0,168	0,140	0,118	0,100	0,086
0,7	$q_{rel} (<1.5h)$	11,550	8,021	5,893	4,512	3,565	2,887	2,386	2,005	1,709	1,473	1,283	1,128	0,999	0,891	0,800	0,722
	$q_{rel} (>1.5h)$	11,550	8,021	5,893	4,512	3,565	2,887	2,386	2,005	1,709	1,473	1,283	1,128	0,999	0,891	0,800	0,722
	$q_{rel} (L/200)$	6,353	3,677	2,315	1,551	1,089	0,794	0,597	0,460	0,361	0,289	0,235	0,194	0,162	0,136	0,116	0,099
0,75	$q_{rel} (<1.5h)$	12,798	8,887	6,529	4,999	3,950	3,199	2,644	2,222	1,893	1,632	1,422	1,250	1,107	0,987	0,886	0,800
	$q_{rel} (>1.5h)$	12,798	8,887	6,529	4,999	3,950	3,199	2,644	2,222	1,893	1,632	1,422	1,250	1,107	0,987	0,886	0,800
	$q_{rel} (L/200)$	6,980	4,039	2,544	1,704	1,197	0,872	0,655	0,505	0,397	0,318	0,259	0,213	0,178	0,150	0,127	0,109
0,8	$q_{rel} (<1.5h)$	14,084	9,781	7,186	5,502	4,347	3,521	2,910	2,445	2,083	1,796	1,565	1,375	1,218	1,087	0,975	0,880
	$q_{rel} (>1.5h)$	14,084	9,781	7,186	5,502	4,347	3,521	2,910	2,445	2,083	1,796	1,565	1,375	1,218	1,087	0,975	0,880
	$q_{rel} (L/200)$	7,619	4,409	2,776	1,860	1,306	0,952	0,716	0,551	0,433	0,347	0,282	0,233	0,194	0,163	0,139	0,119
0,88	$q_{rel} (<1.5h)$	16,216	11,261	8,274	6,335	5,005	4,054	3,350	2,815	2,399	2,068	1,802	1,584	1,403	1,251	1,123	1,014
	$q_{rel} (>1.5h)$	16,216	11,261	8,274	6,335	5,005	4,054	3,350	2,815	2,399	2,068	1,802	1,584	1,403	1,251	1,123	1,014
	$q_{rel} (L/200)$	8,665	5,015	3,158	2,116	1,486	1,083	0,814	0,627	0,493	0,395	0,321	0,264	0,220	0,186	0,158	0,135
1	$q_{rel} (<1.5h)$	19,565	13,587	9,982	7,643	6,039	4,891	4,042	3,397	2,894	2,496	2,174	1,911	1,692	1,510	1,355	1,223
	$q_{rel} (>1.5h)$	19,565	13,587	9,982	7,643	6,039	4,891	4,042	3,397	2,894	2,496	2,174	1,911	1,692	1,510	1,355	1,223
	$q_{rel} (L/200)$	10,282	5,950	3,747	2,510	1,763	1,285	0,966	0,744	0,585	0,468	0,381	0,314	0,262	0,220	0,187	0,161
1,25	$q_{rel} (<1.5h)$	26,976	18,733	13,763	10,538	8,326	6,744	5,574	4,683	3,991	3,441	2,997	2,634	2,334	2,081	1,868	1,686
	$q_{rel} (>1.5h)$	26,976	18,733	13,763	10,538	8,326	6,744	5,574	4,683	3,991	3,441	2,997	2,634	2,334	2,081	1,868	1,686
	$q_{rel} (L/200)$	13,783	7,976	5,023	3,365	2,363	1,723	1,294	0,997	0,784	0,628	0,510	0,421	0,351	0,295	0,251	0,215

Double span – symmetric profile



Trapeza® 40S/160 T		Span [m]															
t [mm]	S320	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00
0,4	$q_{\text{rel}} (<1.5h)$	2,893	2,158	1,674	1,338	1,094	0,912	0,772	0,662	0,574	0,503	0,439	0,386	0,342	0,305	0,274	0,247
	$q_{\text{rel}} (\geq 1.5h)$	2,893	2,158	1,674	1,338	1,094	0,912	0,772	0,662	0,574	0,503	0,439	0,386	0,342	0,305	0,274	0,247
	$q_{\text{rel}} (L/200)$	6,231	3,606	2,271	1,521	1,068	0,779	0,585	0,451	0,355	0,284	0,231	0,190	0,159	0,134	0,114	0,097
0,5	$q_{\text{rel}} (<1.5h)$	4,567	3,409	2,646	2,116	1,732	1,444	1,223	1,049	0,910	0,797	0,698	0,613	0,543	0,485	0,435	0,393
	$q_{\text{rel}} (\geq 1.5h)$	4,567	3,409	2,646	2,116	1,732	1,444	1,223	1,049	0,910	0,797	0,698	0,613	0,543	0,485	0,435	0,393
	$q_{\text{rel}} (L/200)$	9,273	5,366	3,379	2,264	1,590	1,159	0,871	0,671	0,528	0,422	0,343	0,283	0,236	0,199	0,169	0,145
0,6	$q_{\text{rel}} (<1.5h)$	6,577	4,913	3,817	3,053	2,500	2,085	1,766	1,516	1,315	1,152	1,013	0,890	0,788	0,703	0,631	0,570
	$q_{\text{rel}} (\geq 1.5h)$	6,577	4,913	3,817	3,053	2,500	2,085	1,766	1,516	1,315	1,152	1,013	0,890	0,788	0,703	0,631	0,570
	$q_{\text{rel}} (L/200)$	12,673	7,334	4,619	3,094	2,173	1,584	1,190	0,917	0,721	0,577	0,469	0,387	0,322	0,272	0,231	0,198
0,63	$q_{\text{rel}} (<1.5h)$	7,165	5,350	4,153	3,321	2,718	2,267	1,920	1,647	1,429	1,251	1,097	0,964	0,854	0,762	0,684	0,617
	$q_{\text{rel}} (\geq 1.5h)$	7,165	5,350	4,153	3,321	2,718	2,267	1,920	1,647	1,429	1,251	1,097	0,964	0,854	0,762	0,684	0,617
	$q_{\text{rel}} (L/200)$	13,609	7,875	4,959	3,322	2,333	1,701	1,278	0,984	0,774	0,620	0,504	0,415	0,346	0,292	0,248	0,213
0,7	$q_{\text{rel}} (<1.5h)$	8,535	6,360	4,930	3,938	3,219	2,682	2,269	1,946	1,687	1,473	1,283	1,128	0,999	0,891	0,800	0,722
	$q_{\text{rel}} (\geq 1.5h)$	8,535	6,360	4,930	3,938	3,219	2,682	2,269	1,946	1,687	1,473	1,283	1,128	0,999	0,891	0,800	0,722
	$q_{\text{rel}} (L/200)$	15,718	9,096	5,728	3,837	2,695	1,965	1,476	1,137	0,894	0,716	0,582	0,480	0,400	0,337	0,286	0,246
0,75	$q_{\text{rel}} (<1.5h)$	9,563	7,118	5,513	4,399	3,594	2,993	2,531	2,169	1,880	1,632	1,422	1,250	1,107	0,987	0,886	0,800
	$q_{\text{rel}} (\geq 1.5h)$	9,563	7,118	5,513	4,399	3,594	2,993	2,531	2,169	1,880	1,632	1,422	1,250	1,107	0,987	0,886	0,800
	$q_{\text{rel}} (L/200)$	17,267	9,993	6,293	4,216	2,961	2,158	1,622	1,249	0,982	0,787	0,640	0,527	0,439	0,370	0,315	0,270
0,8	$q_{\text{rel}} (<1.5h)$	10,632	7,905	6,117	4,877	3,982	3,314	2,802	2,400	2,080	1,796	1,565	1,375	1,218	1,087	0,975	0,880
	$q_{\text{rel}} (\geq 1.5h)$	10,632	7,905	6,117	4,877	3,982	3,314	2,802	2,400	2,080	1,796	1,565	1,375	1,218	1,087	0,975	0,880
	$q_{\text{rel}} (L/200)$	18,848	10,908	6,869	4,602	3,232	2,356	1,770	1,363	1,072	0,859	0,698	0,575	0,480	0,404	0,343	0,295
0,88	$q_{\text{rel}} (<1.5h)$	12,419	9,220	7,125	5,676	4,630	3,851	3,253	2,785	2,399	2,068	1,802	1,584	1,403	1,251	1,123	1,014
	$q_{\text{rel}} (\geq 1.5h)$	12,419	9,220	7,125	5,676	4,630	3,851	3,253	2,785	2,399	2,068	1,802	1,584	1,403	1,251	1,123	1,014
	$q_{\text{rel}} (L/200)$	21,437	12,406	7,812	5,234	3,676	2,680	2,013	1,551	1,220	0,977	0,794	0,654	0,545	0,459	0,391	0,335
1	$q_{\text{rel}} (<1.5h)$	15,268	11,311	8,726	6,942	5,657	4,700	3,968	3,395	2,894	2,496	2,174	1,911	1,692	1,510	1,355	1,223
	$q_{\text{rel}} (\geq 1.5h)$	15,268	11,311	8,726	6,942	5,657	4,700	3,968	3,395	2,894	2,496	2,174	1,911	1,692	1,510	1,355	1,223
	$q_{\text{rel}} (L/200)$	25,438	14,721	9,270	6,210	4,362	3,180	2,389	1,840	1,447	1,159	0,942	0,776	0,647	0,545	0,464	0,397
1,25	$q_{\text{rel}} (<1.5h)$	21,744	16,050	12,347	9,799	7,969	6,610	5,572	4,683	3,991	3,441	2,997	2,634	2,334	2,081	1,868	1,686
	$q_{\text{rel}} (\geq 1.5h)$	21,744	16,050	12,347	9,799	7,969	6,610	5,572	4,683	3,991	3,441	2,997	2,634	2,334	2,081	1,868	1,686
	$q_{\text{rel}} (L/200)$	34,099	19,733	12,427	8,325	5,847	4,262	3,202	2,467	1,940	1,553	1,263	1,041	0,868	0,731	0,621	0,533

Triple span – symmetric profile



Trapeza® 40S/160 T		Span [m]															
t [mm]	S320	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00
0,4	$q_{Ed} (<1.5h)$	3,472	2,601	2,025	1,623	1,330	1,111	0,942	0,809	0,703	0,616	0,545	0,482	0,427	0,381	0,342	0,309
	$q_{Ed} (\geq 1.5h)$	3,472	2,601	2,025	1,623	1,330	1,111	0,942	0,809	0,703	0,616	0,545	0,482	0,427	0,381	0,342	0,309
	$q_{Ed} (L/200)$	4,608	2,667	1,679	1,125	0,790	0,576	0,433	0,333	0,262	0,210	0,171	0,141	0,117	0,099	0,084	0,072
0,5	$q_{Ed} (<1.5h)$	5,480	4,108	3,200	2,565	2,104	1,758	1,491	1,282	1,113	0,976	0,863	0,767	0,679	0,606	0,544	0,491
	$q_{Ed} (\geq 1.5h)$	5,480	4,108	3,200	2,565	2,104	1,758	1,491	1,282	1,113	0,976	0,863	0,767	0,679	0,606	0,544	0,491
	$q_{Ed} (L/200)$	6,857	3,968	2,499	1,674	1,176	0,857	0,644	0,496	0,390	0,312	0,254	0,209	0,174	0,147	0,125	0,107
0,6	$q_{Ed} (<1.5h)$	7,888	5,918	4,612	3,700	3,037	2,538	2,154	1,851	1,608	1,411	1,247	1,111	0,986	0,879	0,789	0,712
	$q_{Ed} (\geq 1.5h)$	7,888	5,918	4,612	3,700	3,037	2,538	2,154	1,851	1,608	1,411	1,247	1,111	0,986	0,879	0,789	0,712
	$q_{Ed} (L/200)$	9,372	5,423	3,415	2,288	1,607	1,171	0,880	0,678	0,533	0,427	0,347	0,286	0,238	0,201	0,171	0,146
0,63	$q_{Ed} (<1.5h)$	8,596	6,445	5,021	4,026	3,303	2,760	2,342	2,012	1,748	1,533	1,355	1,205	1,068	0,952	0,855	0,771
	$q_{Ed} (\geq 1.5h)$	8,596	6,445	5,021	4,026	3,303	2,760	2,342	2,012	1,748	1,533	1,355	1,205	1,068	0,952	0,855	0,771
	$q_{Ed} (L/200)$	10,063	5,824	3,667	2,457	1,726	1,258	0,945	0,728	0,573	0,458	0,373	0,307	0,256	0,216	0,183	0,157
0,7	$q_{Ed} (<1.5h)$	10,249	7,670	5,966	4,778	3,915	3,268	2,771	2,379	2,065	1,810	1,600	1,410	1,249	1,114	1,000	0,902
	$q_{Ed} (\geq 1.5h)$	10,249	7,670	5,966	4,778	3,915	3,268	2,771	2,379	2,065	1,810	1,600	1,410	1,249	1,114	1,000	0,902
	$q_{Ed} (L/200)$	11,623	6,726	4,236	2,838	1,993	1,453	1,092	0,841	0,661	0,529	0,430	0,355	0,296	0,249	0,212	0,182
0,75	$q_{Ed} (<1.5h)$	11,492	8,589	6,674	5,341	4,374	3,649	3,092	2,653	2,303	2,017	1,777	1,562	1,384	1,234	1,108	1,000
	$q_{Ed} (\geq 1.5h)$	11,492	8,589	6,674	5,341	4,374	3,649	3,092	2,653	2,303	2,017	1,777	1,562	1,384	1,234	1,108	1,000
	$q_{Ed} (L/200)$	12,769	7,389	4,653	3,117	2,189	1,596	1,199	0,924	0,726	0,582	0,473	0,390	0,325	0,274	0,233	0,200
0,8	$q_{Ed} (<1.5h)$	12,783	9,544	7,409	5,925	4,849	4,043	3,424	2,937	2,548	2,232	1,956	1,719	1,523	1,358	1,219	1,100
	$q_{Ed} (\geq 1.5h)$	12,783	9,544	7,409	5,925	4,849	4,043	3,424	2,937	2,548	2,232	1,956	1,719	1,523	1,358	1,219	1,100
	$q_{Ed} (L/200)$	13,938	8,066	5,079	3,403	2,390	1,742	1,309	1,008	0,793	0,635	0,516	0,425	0,355	0,299	0,254	0,218
0,88	$q_{Ed} (<1.5h)$	14,945	11,140	8,637	6,899	5,641	4,700	3,978	3,411	2,957	2,586	2,252	1,980	1,754	1,564	1,404	1,267
	$q_{Ed} (\geq 1.5h)$	14,945	11,140	8,637	6,899	5,641	4,700	3,978	3,411	2,957	2,586	2,252	1,980	1,754	1,564	1,404	1,267
	$q_{Ed} (L/200)$	15,852	9,174	5,777	3,870	2,718	1,982	1,489	1,147	0,902	0,722	0,587	0,484	0,403	0,340	0,289	0,248
1	$q_{Ed} (<1.5h)$	18,394	13,682	10,590	8,447	6,898	5,742	4,855	4,160	3,604	3,119	2,717	2,388	2,116	1,887	1,694	1,529
	$q_{Ed} (\geq 1.5h)$	18,394	13,682	10,590	8,447	6,898	5,742	4,855	4,160	3,604	3,119	2,717	2,388	2,116	1,887	1,694	1,529
	$q_{Ed} (L/200)$	18,811	10,886	6,855	4,592	3,225	2,351	1,767	1,361	1,070	0,857	0,697	0,574	0,479	0,403	0,343	0,294
1,25	$q_{Ed} (<1.5h)$	26,248	19,451	15,010	11,943	9,733	8,088	6,828	5,843	4,988	4,301	3,747	3,293	2,917	2,602	2,335	2,108
	$q_{Ed} (\geq 1.5h)$	26,248	19,451	15,010	11,943	9,733	8,088	6,828	5,843	4,988	4,301	3,747	3,293	2,917	2,602	2,335	2,108
	$q_{Ed} (L/200)$	25,215	14,592	9,189	6,156	4,324	3,152	2,368	1,824	1,435	1,149	0,934	0,770	0,642	0,540	0,460	0,394

Explanatory note:

$q_{Ed} (<1.5h)$	design resistance [kN/m ²]	end support width at least 40 mm, end support at distance at least 40 mm clear from a free end internal support width at least 120 mm
$q_{Ed} (\geq 1.5h)$	design resistance [kN/m ²]	end support width at least 40 mm, end support at distance at least 1.5 x h _w (web height) clear from a free end internal support width at least 120 mm
$q_{Ed} (\leq L/200)$	characteristics load that meets the serviceability limit for deflection of L/200 [kN/m ²]	