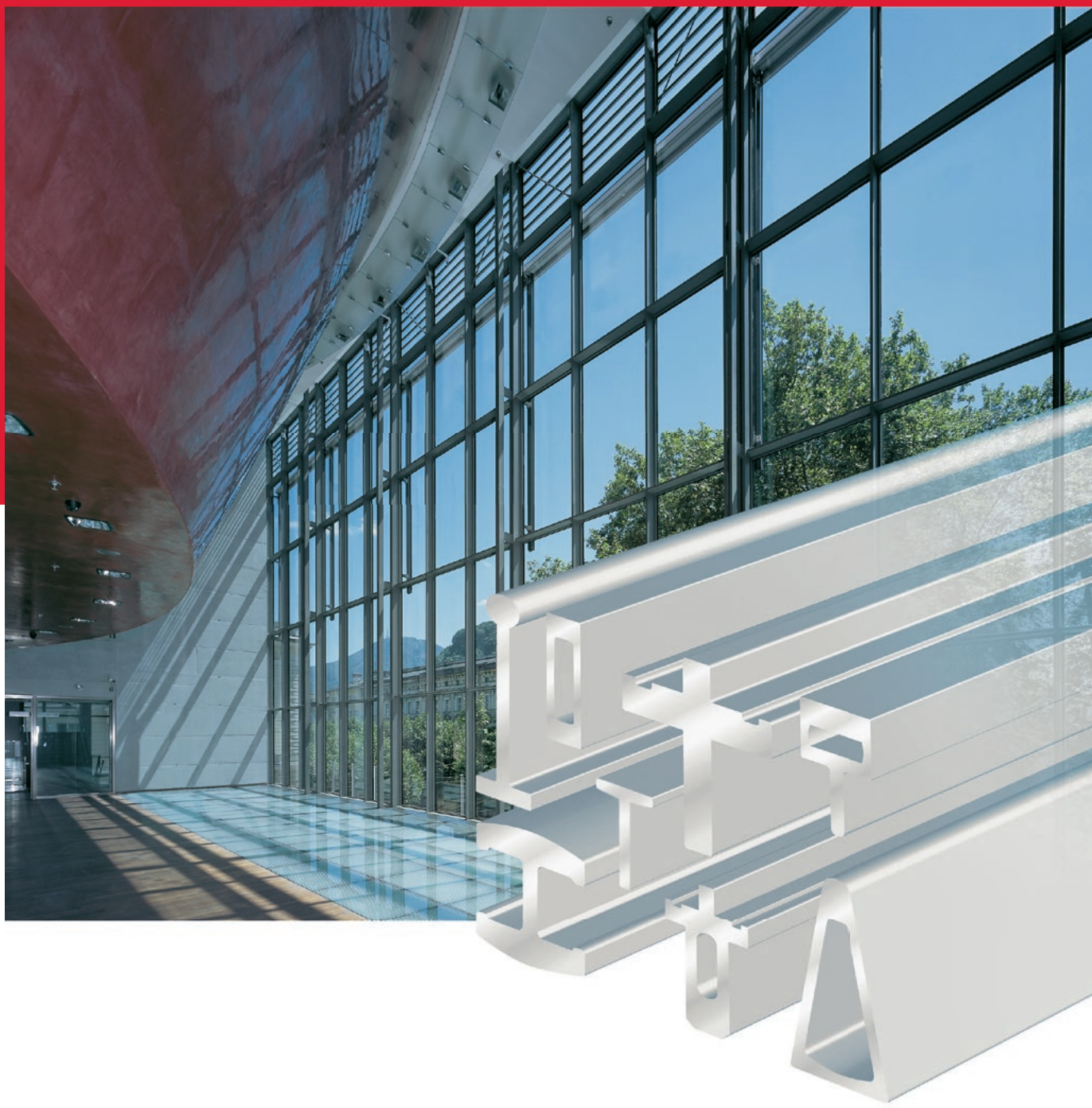
STEEL IN ARCHITECTURE

Special profiles for façade construction



HOESCH SCHWERTER
EXTRUDED PROFILES GmbH

A partner with style

- Architecture with steel
- Our experience
- Our philosophy
- Our know-how

Architecture with steel

"FORM IS NOT THE AIM OF OUR WORK,
IT IS THE RESULT."

Ludwig Mies van der Rohe

Southwest Central Bank, Stuttgart

Modern architecture is increasingly bringing steel and glass materials to the fore. Structures which use steel to fulfil the highest demands with regard to both architecture and design come across as light, open and transparent.

Building with steel is durable, environmentally sound, and sustainable. This, too, is an argument for the material which architects and engineers use in many different ways to realise their ideas and visions.

Today well-known architects are developing architecturally pioneering industrial, commercial and office buildings, using steel profiles from Hoesch Schwerter Extruded Profiles GmbH. Steel profile designs unite functionality with form.

Their corrosion resistance, long lifespan and extreme stability open up broad windows of design opportunity for lasting solutions. Building with steel offers flexibility, diversity and economy. For planners and architects the wide-ranging spectrum of highly differentiated profile geo-metries opens up an almost infinite number of possible forms.

Daimler Benz Dealership

Our experience

"IN ARCHITECTURE, THERE IS ONLY PAST AND FUTURE."

Walter Gropius

For the renovation of the Gropius-designed Fagus works building (Altfeld/Leine), Hoesch Schwerter Extruded Profiles GmbH supplied special profiles produced using the original designs.

At the location of Hoesch Schwerter Extruded Profiles GmbH special profiles for the construction industry has been producing already for decades. The experience gained from the manufacture of forged parts, strip steel and wire has also been used since 1926 for producing special sprofiles. The Schwerter works has thus accompanied the development or modern steel-based architecture right from its beginnings. Alongside knowledgeable and creative engineers, master builders and architects, Hoesch Schwerter Extruded Profiles GmbH can be considered as a co-founder of an innovative construction culture, working in close co-operation with highly capable steel construction companies.

Advances in metallurgical research, steel processing and above all steel extrusion technology together with modern production, jointing, welding and assembly techniques have all contributed equally to this. Hoesch Schwerter Extruded Profiles GmbH is focused on the task of manufacturing and selling special products made of steel. In contrast to the mass production of other suppliers, however, the Schwerter works makes products whose properties are determined by the customers according to their requirements.

Over the course of the last 40 years, Hoesch Schwerter Extruded Profiles GmbH has substantially expanded its activities both in German and in international markets. Today, the company is among the leading steel processing companies in Europe.

Our philosophy

"I NEVER WANT TO BUILD A ROOM THAT HAS NO CONNECTION TO THE OUTSIDE WORLD." *Egon Eiermann*

Andechs monastery

Hoesch Schwerter Extruded Profiles GmbH shall be the partner of planners, designers, structural engineers and architiects. We shall combine the interests of our customer and the needs of our employees as well as general societal interests of an ethical, social, ecological and economic nature in our entrepreneurial decision-making processes. The success of our products and services is determined by our customers, who thus determine the future of our enterprise.

We shall be spurred on to ever new peaks of performance by our customers' demand for a high quality, technologically sophisticated service at competitive prices. With the aid of our ultra modern technology and the high degree of commitment from our production and sales teams we are able to be highly flexible in realising the demands of our customers. We use innovative techniques, materials and products to maintain and increase our lead in the increasingly sophisticated façade building market.

We have firmly anchored our business policy in high product quality and optimum economy, whilst giving equal priority to all aspects of environmental protection, health and safety, making products with a long lifespan and a high degree of recyclability.

Chamber of the Parliament of Saxony, Dresden

Our know-how

"THE SIMPLE IS NOT ALWAYS THE BEST.
BUT THE BEST IS ALWAYS SIMPLE."

Heinrich Tessenow

Foyer of the
MDR headquarters, Leipzig

Steel as a material can be characterised above all by the fact that with regard to stability and hardness it is almost unbeatable. Workpieces of steel can bear extremely high stresses, because they have only a slight tendency to elastic bowing. In order to achieve the same product characteristics with aluminium or wood, the workpieces have to be far more massive and have a much greater volume.

Hoesch Schwerter Extruded Profiles GmbH optimises these positive properties still further by utilising state of the art steel production processes. Above all hot extruded profiles increase the advantages of the material described above. With these forming process, our customers are not bound to high tool charges and long machine preparation times.

We locate the material mass where it provides structural or thermotechnical advantages. Sharp edges provide for clear geometries.

Hoesch Schwerter Extruded Profiles GmbH uses also in co-operation with our sister company Hoesch Schwerter Profile GmbH the following manufacturing processes:

- hot extrusion (solid and hollow cross-sections)
- cold drawing, proceeding from a hot extruded or hot rolled profile (solid and hollow cross-sections)
- hot rolling (only expedient for simple solid cross-sections in large volumes)

Glass-metal façade of the Citypoint building in Kassel (above),
Glass triangle in the Commerzbank building in Frankfurt (below)

Projects and profiles

- Introduction
- Examples from practice
  - structural
  - functional
  - design

Projects and profiles

"NO ABSTRACT THEORY, NO GAME OF FORMS, NO TECHNOLOGICAL OR PRAGMATIC APPLICATION IS SUFFICIENT TO CONVEY HOW ARCHITECTURE GOES BEYOND THE SIMPLE USE OF MATERIAL." *Daniel Libeskind*

Regional Social Insurance Office of Schleswig-Holstein, Lübeck

In planning façades, architects not only impose ever greater demands on the flexible adaptation of the materials, but also on individual desires for style. Aspects such as energy efficiency, economy, and sustainability are increasingly gaining in importance.

Within the realm of the production possibilities, special steel profiles from Hoesch Schwerter Extruded Profiles GmbH can fulfil almost all the requirements for freedom of design, construction physics and architecture as part of an overall ecological concept.

We develop our special profiles in close co-operation with our customers: alonside our range of standard profiles, we offer above all solutions for unique design and production problems.

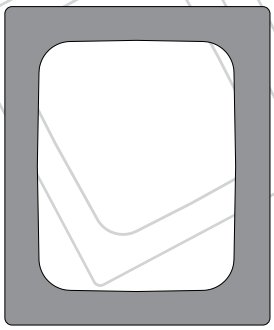
On the following pages, we will show how varied the architectural possibilities of special profiles from Hoesch Schwerter Extruded Profiles GmbH are by means of a selection of practical examples. To make it easier to gain a rapid overview, we have divided the examples into structural, functional and design orientation – even though all of the profiles we produce exhibit all of these aspects.

We will be pleased to work with you to determine which profile solution is appropriate for your project, and the precise technical and economic benefits that the use of one of our special profiles could bring.

Protestant Clinic
Stuttgart

Photo: Kulkwitzer Stahlbau

Architect: ARCASS
Façade consultant: Weber & Partner
Façade: Kulkwitzer Stahl- und Metallbau
Profiles: Mullion profiles
Dimensions: 200 x 20 mm
60 x 50 mm
Material: S235JRG2

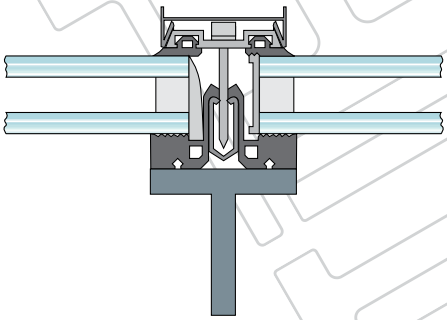


Law Courts
Leipzig

Photo: Kulkwitzer Stahlbau

Architect:	Hentrich-Petschnigg & Partner
Façade consultant:	IFFT Karlotto Schott
Façade:	Kulkwitzer Stahl- und Metallbau
Profiles:	Mullion and transom profiles
Dimensions:	180 x 50 x 15 mm
	130 x 50 x 15 mm
Material:	S235JRG2

Indoor swimming pool
Pirna

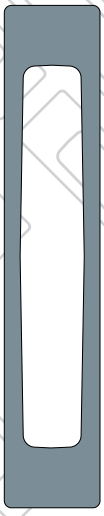


Architect:	Arnke-Häntsch
Façade:	Scheffer
Profiles:	Mullion and transom profiles
Dimensions:	200 x 60 x 25 mm 60 x 60 x 10 mm
Material:	S235JRG2

Experimental factory
Magdeburg

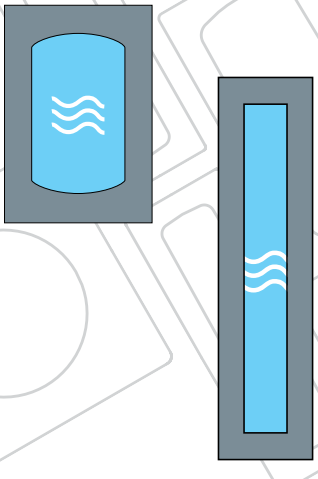
Photo: Gerrit Engel

Architect: Sauerbruch Hutton Architekten
Façade: Hornik
Profiles: Mullion profiles
Dimensions: 210 x 40 x 25 x 6 mm
Material: S235JRG2



Federal Chancellor's Office
Berlin

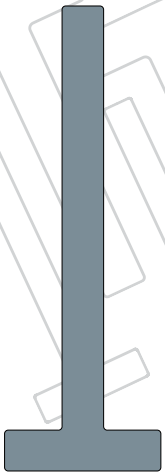
Architect:	Axel Schultes and Charlotte Frank
Façade consultant:	Fuchs
Façade:	App/Schneider
Profiles:	Mullion and transom profiles (heated)
Dimensions:	120 x 40 x 8 mm
	80 x 40 x 6 mm
Material:	S235JRG2
	S355J2G3C



The House of Architects
Munich

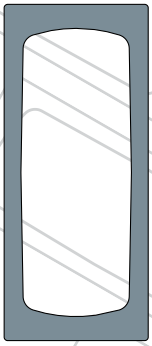
Photo: Simone Rosenberg

Architect: Drescher & Kubina
Façade consultant: Fuchs
Façade: Metallbau Schmitt
Profiles: Mullion and transom profiles
Dimensions: 180 x 60 x 15 mm
115 x 60 x 15 mm
Material: S235JRG2



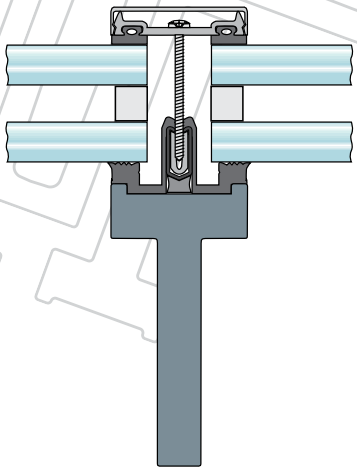
New Theatre
Erfurt

Architect: Prof. Friedrich + Partner
Façade: Thoms
Profiles: Transom profiles
Dimensions: 140 x 60 x 10 x 7 mm
Material: S235JRG2



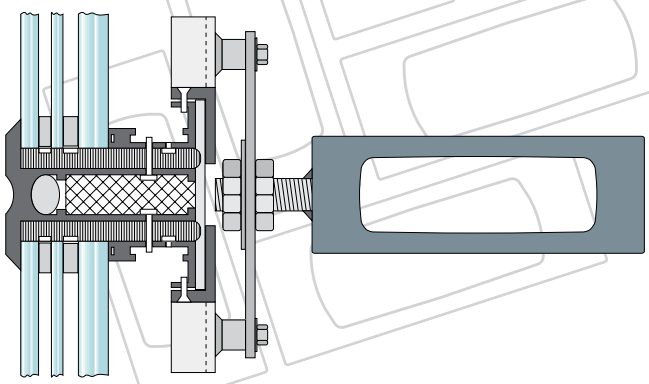
International Tribunal for Maritime Law Hamburg

Architect: von Branca
Façade consultant: Mosbacher
Façade: Frieß / Geerds
Profiles: Mullion, transom and roof profiles
Dimensions: 120 x 60 x 20 mm
150 x 60 x 15 mm
Material: S235JRG2



"Staende" House
Dusseldorf

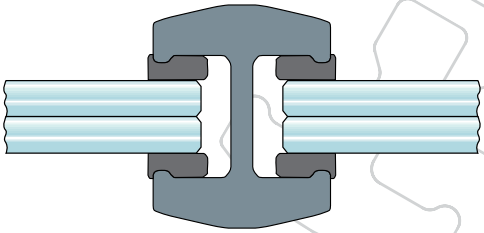
Architect: Kiessler & Partner
Roof: Mero
Profiles: Rectangular hollow profiles
Dimensions: 160 x 8 x 60 x 25 mm
Material: S235JRG2



German Post Headquaters
Bonn

Photo: Daniele Domenicali

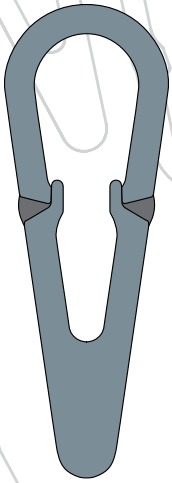
Architect: Helmut Jahn
Façade consultant: DS-Plan
Façade: Gartner
Profiles: Mullion and transom profiles for secondary façades
Dimensions: 65 x 60 x 5/10 mm
Material: X6CrNiMoTi17-12-2 WS 1.4571



Hangar 8
Salzburg

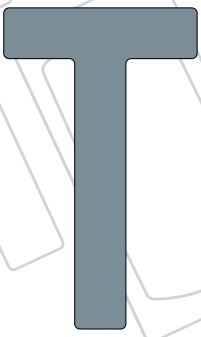
Photos: Atelier Volkmar Burgstaller

Architect: Dipl.-Ing. Dr. Volkmar Burgstaller
Façade: Pagitz
Profiles: Transom profiles
Dimensions: 240 x 82,5 mm
Material: S355J2G3



Central Bank of Baden-Württemberg
Stuttgart

Photo: Rupert App GmbH & Co.

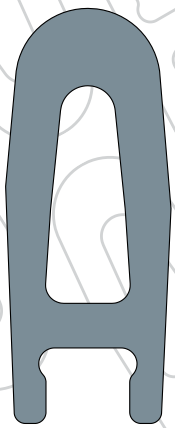


Architect: Wofram Wöhr Architekten
Façade consultant: Drees & Sommer
Façade: App
Profiles: Mullion and transom profiles
Dimensions: 150 x 60 x 15 mm
100 x 60 x 15 mm
80 x 45 x 15 mm
Material: S235JRG2

City Point Building
Kassel

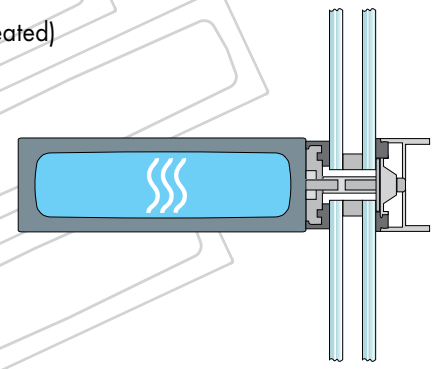
Photo: Anders Metallbau

Architect: Jourdan & Müller PAS
Façade consultant: Lange
Façade: Anders
Profiles: Mullion and transom profiles
Dimensions: 90 x 35 mm
Material: S235JRG2



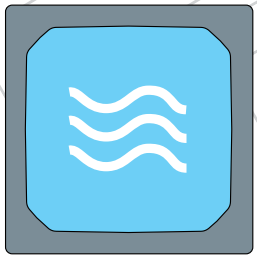
Headquarters of the MDR
Leipzig

Architect: GPS/Struhk & Partner
Façade consultant: Lange
Façade: FKN
Profiles: Mullion and transom profiles (heated)
Dimensions: 120 x 60 x 6 x 12 mm
140 x 60 x 10 mm
Material: S235JRG2



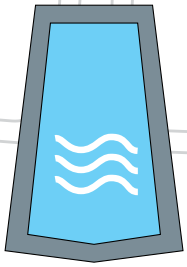
Conference Centre
Luxembourg

Architect: Jourdan & Müller PAS
Façade consultant: IFFT Karlotto Schott
Façade: Anders
Profiles: Mullion and transom profiles (heated)
Dimensions: 60 x 60 x 5 mm
60 x 30 x 5 mm
Material: S235JRG2



"Paul-Loebe"-Haus
Berlin

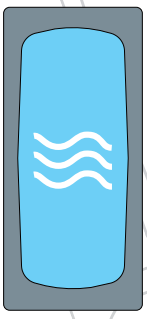
Architect: Stephan Braunfels
Façade consultant: Fuchs
Façade: Roschmann
Profiles: Mullion profiles (heated)
Dimensions: 145 x 98 x 70 x 9 mm
Material: S235JRG2



Kroellwitz Clinic
Halle

functional

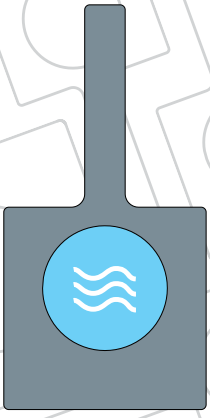
Architect: Hascher Jehle Architektur
Façade consultant: Drees & Sommer
Façade: Radeberger Fensterbau
Profiles: Mullion and transom profiles (heated)
Dimensions: 130 x 60 x 5 mm
60 x 60 x 5 mm
Material: S235JRG2



Telecom Representation House
Berlin

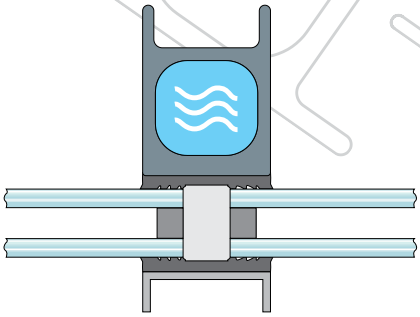
Photo: Andreas Braun

Architect: Henze & Vahjen
Façade: Gartner, Timm
Profiles: Mullion and transom profiles (heated)
Dimensions: 60 x 60 mm mit Steg
Material: S235JRG2



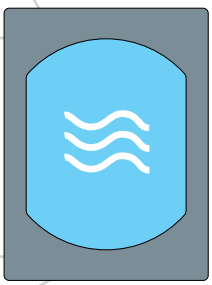
Indoor swimming Pool Schöneberg
Berlin

Architect: Arnke-Häntsch
Façade: Lehmkuhl
Profiles: Mullion profiles (heated)
Dimensions: 60 x 50 x 5 mm
Material: S235JRG2



German Central Bank
Frankfurt

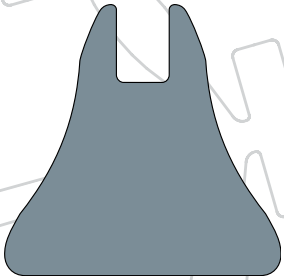
Architect: ABB Scheid, Schmidt & Partner
Façade: Roschmann
Profiles: Hollow profiles (heated)
Dimensions: 80 x 60 mm
Material: S235JRG2



Publicis Drugstore
Paris

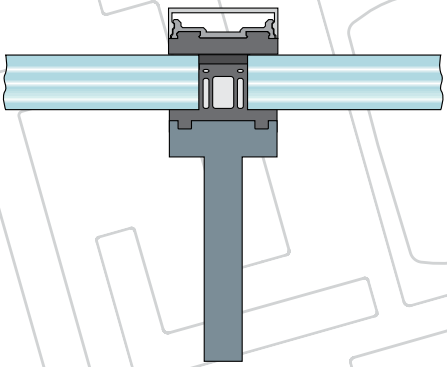
Photo: Daniele Domenicali

Architect: Michele Saee
Façade: Gartner
Profiles: Sabre profiles
Dimensions: 100 x 100 mm
Material: X2CrNiMoN22-5-3
WS 1.4462



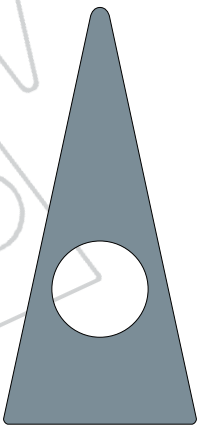
North German Central Bank Building
Hannover

Architect:	Behnisch, Behnisch & Partner
Façade consultant:	Mosbacher
Façade:	App
Profiles:	Mullion and transom profiles
Dimensions:	160 x 50 x 15 mm
	100 x 50 x 15 mm
Material:	S235JRG2
	X6CrNiMoTi17-12-2
	WS 1.4571



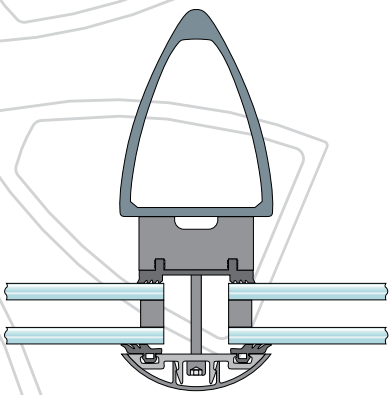
"Hertie" Store
Munich

Architect: Heine + Prof. Breuer
Façade consultant: Lange
Dach: Gartner
Profiles: Triangular hollow profiles
Dimensions: 130 x 60 mm
Material: S235JRG2



RWE Headquarters
Essen

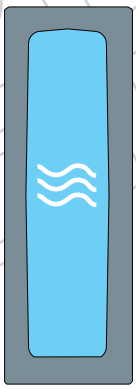
Architect: Ingenhoven, Overdiek & Partner
Façade: Gartner
Profiles: Mullion and hollow profiles
Dimensions: 110 x 80 x 6 mm
Material: S235JRG2



"Jakob Kaiser" House
Berlin

Photos: Andreas Braun

Architect: de Architekten Cie.
Façade consultant: Lange
Façade: Gartner
Profiles: Mullion and transom profiles (heated)
Dimensions: 180 x 60 x 30 x 10 mm
130 x 60 mm mit Steg
Material: S235JRG2



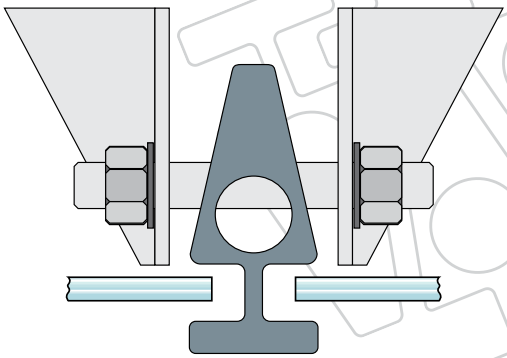
West Coast technical college
Heide / Schleswig-Holstein

Photo: Kulkwitzer Stahlbau

Architect: Scheuring und Partner
Façade: Kulkwitzer Stahl- und Metallbau
Profiles: Mullion and transom profiles
Dimensions: 130 x 60 x 30 x 10 mm
Material: S235JRG2

Law Courts
Lille, France

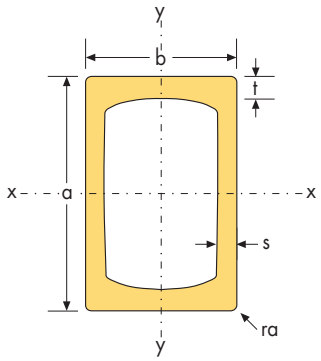
Architect: van Santen
Façade: Olivier
Profiles: Mullion and hollow profiles
Dimensions: 180 x 80 mm
Material: X2CrNi19-11
WS 1.4306



Dimensions and data

- Standard hollow profiles
- Standard T-profiles
- Stainless steel standard profiles

Standard hollow profiles



SHARP-EDGED HOT OR HOT/COLD PRODUCED*) STEEL TUBING WITH SQUARE AND RECTANGULAR CROSS-SECTION

	Hot	Cold
Corner radii	ra ≈ 1.5 mm	ra ≈ 0.8 mm

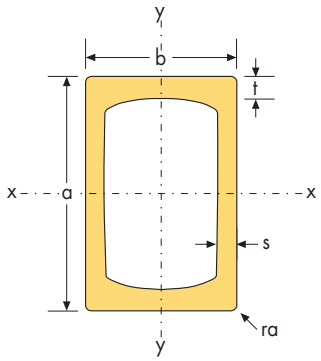
External edge length		Wall thickness		Cross section	Weight	Surface area	Static values**) for x–x, y–y axes					
							x–x			y–y		
							Moment of inertia	Moment of resistance	Radius of inertia	Moment of inertia	Moment of resistance	Radius of inertia
							I_x		i_x	I_y	W_y	i_y
mm	mm	mm	mm	cm^2	kg/m	m^2/m	cm^4	cm^3	cm	cm^4	cm^3	cm
40	40	5	5	7.8	6.2	0.157	15.82	7.91	1.42	15.82	7.91	4.42
		7	7	9.5	7.4	0.157	17.78	8.89	1.37	17.78	8.89	1.37
50	30	5	5	7.9	6.2	0.157	22.54	9.01	1.69	9.20	6.13	1.08
50	40	5	5	9.0	7.1	0.177	28.16	11.26	1.77	19.24	9.62	1.46
		7	7	10.9	8.6	0.177	32.17	12.87	1.72	21.73	10.86	1.41
50	50	5	5	9.8	7.7	0.197	33.14	13.25	1.84	33.14	13.25	1.84
		6	6	11.7	9.1	0.197	37.32	14.93	1.79	37.32	14.93	1.79
60	30	5.5	5.5	10.1	8.0	0.175	40.47	13.49	2.00	11.65	7.76	1.07
60	40	5	5	10.1	7.9	0.197	46.32	15.22	2.14	22.37	11.18	1.49
		6	6	11.5	9.0	0.197	50.50	16.83	2.10	24.39	12.20	1.46
		8	8	14.1	11.1	0.197	57.54	19.18	2.02	27.55	13.78	1.40
60	50	5.5	5.5	12.7	10.0	0.215	58.95	19.65	2.15	43.22	17.29	1.84
		7.5	7.5	14.6	11.5	0.217	70.59	23.53	2.20	49.90	19.96	1.85
60	60	5	5	12.6	9.9	0.237	63.36	21.12	2.24	63.36	21.12	2.24
***)		5	5	16.3	12.8	0.237	77.15	25.72	2.18	77.15	25.71	2.18
		6	6	14.2	11.1	0.237	69.21	23.07	2.21	69.21	23.07	2.21
		8	8	17.8	14.0	0.237	81.11	27.03	2.13	81.11	27.03	2.13
***)		10	10	23.4	18.4	0.237	95.26	31.75	2.02	95.26	31.75	2.02
		12.5	12.5	26.4	20.7	0.237	100.46	33.49	1.95	100.46	33.49	1.95
70	40	5	8	12.9	10.1	0.217	80.96	23.13	2.51	26.71	13.35	1.44
70	50	6	8	16.4	12.9	0.237	104.49	29.85	2.52	52.68	21.06	1.79
70	60	6	8	20.1	15.8	0.257	129.89	37.11	2.54	90.75	30.24	2.12
70	70	5	5	16.1	12.6	0.277	112.19	32.05	2.64	112.19	32.05	2.64
		8	8	20.6	16.2	0.277	133.57	38.16	2.55	133.57	38.16	2.55
80	40	5	6	13.5	10.9	0.239	106.23	26.56	2.81	30.50	15.24	1.50
		6	6	13.9	10.9	0.239	105.47	26.37	2.75	31.61	15.24	1.51
80	50	5	6	15.5	12.3	0.257	132.30	33.07	2.90	54.81	21.92	1.87
		6	10	19.5	15.3	0.257	159.02	39.75	2.86	61.72	24.68	1.78
80	60	5	5	17.5	13.7	0.277	153.03	38.24	2.96	88.74	29.57	2.25
		6.5	9	22.1	17.3	0.277	186.96	46.73	2.91	101.53	33.83	2.14
		7	7.5	21.0	16.5	0.277	175.21	43.80	2.89	100.91	33.63	2.19
80	80	5	5	17.4	13.7	0.317	162.04	40.49	3.05	162.04	40.49	3.05
		8	8	23.8	18.7	0.317	207.50	51.87	2.95	207.50	51.87	2.95
90	40	5	6	14.7	11.5	0.257	143.55	31.90	3.13	33.96	16.97	1.52
		6	10	18.0	14.1	0.257	173.58	38.57	3.11	37.71	18.85	1.45
90	50	6	10	20.7	16.2	0.277	213.45	47.43	3.21	67.86	27.14	1.81
90	60	6	10	24.0	18.8	0.297	258.83	57.52	3.28	111.67	37.22	2.16
100	40	6	10	19.4	15.2	0.277	228.76	45.72	3.43	41.64	20.79	1.46
100	50	5	5	17.0	13.4	0.297	213.73	42.75	3.55	64.93	25.97	1.95
		5	6	17.8	14.0	0.297	227.78	45.55	3.58	65.87	26.87	1.92
		7.5	7.5	21.7	17.0	0.297	256.63	51.33	3.44	76.99	30.79	1.88
100	60	5	5	19.7	15.5	0.317	262.31	52.46	3.65	106.28	35.43	2.32
		6.3	6.3	22.4	17.6	0.317	288.08	57.62	3.59	117.13	39.04	2.29
		7	7	24.3	18.9	0.317	303.84	60.77	3.55	123.55	41.18	2.26

*) cold produced; s + t > 8–10 mm

**) The cross-sections, weights, surface areas and structural values are computer-calculated from the dimensions given in the table (without warranty). They relate to the mean tolerance specifications.

***) round inner contour

Standard hollow profiles



SHARP-EDGED HOT OR HOT/COLD PRODUCED*) STEEL TUBING WITH SQUARE AND RECTANGULAR CROSS-SECTION

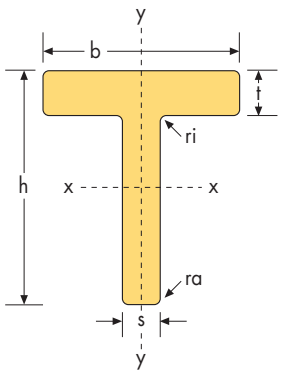
	Hot	Cold
Corner radii	ra ≈ 1.5 mm	ra ≈ 0.8 mm

External edge length		Wall thickness		Cross section	Weight	Surface area	Static values**) for x–x, y–y axes					
							x–x			y–y		
							Moment of inertia	Moment of resistance	Radius of inertia	Moment of inertia	Moment of resistance	Radius of inertia
							I_x		i_x	I_y	W_y	i_y
mm	mm	mm	mm	cm^2	kg/m	m^2/m	cm^4	cm^3	cm	cm^4	cm^3	cm
		8.5	8.5	27.6	21.7	0.317	334.32	66.86	3.48	135.52	45.17	2.22
100	100	6	6	26.8	21.1	0.397	398.04	79.61	3.85	398.04	79.61	3.85
		8.8	8.8	43.1	26.8	0.397	475.69	95.14	3.73	475.69	95.14	3.73
110	50	6	10.2	23.4	18.4	0.137	365.30	66.42	3.95	78.77	31.51	1.83
120	40	8	8	24.25	19.03	0.319	370.62	61.77	3.91	53.53	26.76	1.49
		10	10	29.07	22.82	0.319	424.93	70.82	3.82	58.27	29.13	1.42
120	40	10	20	32.8	25.8	0.317	502.25	83.71	3.91	59.14	29.57	1.34
120	50	6	10.8	24.3	19.1	0.337	447.73	74.62	4.29	84.60	33.84	1.87
120	60	5	7	22.7	17.8	0.358	441.90	73.65	4.41	122.06	40.68	2.32
		6	12	29.2	22.9	0.358	566.15	94.36	4.40	141.22	47.07	2.20
		7	7.5	25.7	20.2	0.357	466.73	77.79	4.26	137.82	45.93	2.32
		8	8	28.5	22.3	0.358	496.39	82.71	4.17	149.96	49.98	2.29
		10	10	33.88	26.6	0.359	565.54	94.26	4.09	168.35	56.12	2.23
120	80	6.3	6.3	30.9	24.2	0.397	612.14	102.00	4.45	291.75	72.92	3.07
		8	8	34.5	27.1	0.397	663.46	110.55	4.38	318.53	79.62	3.04
140	40	8	8	29.3	23.0	0.357	594.02	84.86	4.50	63.97	31.98	1.48
140	60	6	6	25.4	20.0	0.397	618.27	88.32	4.93	146.78	48.93	2.40
		7	7	28.7	22.5	0.397	679.92	97.13	4.97	160.93	53.54	2.37
		7	10	31.4	24.6	0.397	776.91	110.99	4.97	165.04	55.01	2.29
		7	12	33.2	26.0	0.397	836.41	119.49	5.02	168.01	56.00	2.25
		10	10	38.0	29.9	0.397	849.41	121.34	4.67	194.82	64.93	2.24
140	70	6	6	27.6	21.7	0.417	708.73	101.22	5.07	215.26	61.49	2.79
		8	12	38.8	30.4	0.417	986.89	140.98	5.04	265.54	75.87	2.62
150	50	6	6	26.2	20.5	0.397	661.42	88.19	5.02	104.45	41.78	2.00
		7.5	7.5	29.8	23.4	0.397	746.56	99.54	5.01	114.44	45.38	1.95
150	60	6	10	30.4	23.8	0.417	891.60	118.85	5.42	162.46	54.14	2.31
		8	10	35.5	27.7	0.417	952.98	127.03	5.20	187.20	62.40	2.30
		10	10	40.2	31.6	0.417	1016.70	135.56	5.03	207.91	69.30	2.27
150	70	8	12	40.3	31.7	0.437	1170.09	156.01	5.39	281.43	80.41	2.64
160	60	7	8	34.6	27.1	0.437	1060.09	132.48	5.53	198.01	63.34	2.39
		8	12	38.8	30.5	0.437	1208.50	151.06	5.58	201.75	67.24	2.28
160	70	8	12	42.0	33.0	0.457	1374.87	171.86	5.72	297.82	85.09	2.66
160	80	6	6	36.4	28.5	0.477	1213.04	151.60	5.77	373.00	93.23	3.20
		6.6	12	42.3	33.2	0.477	1529.09	191.14	6.01	385.19	96.28	3.02,
180	60	8	10	40.7	32.0	0.477	1539.84	171.06	6.15	223.06	74.35	2.34
		10	10	46.8	36.8	0.437	1665.74	185.08	5.97	248.70	82.89	2.31
		10	25	58.3	45.8	0.477	2248.21	249.80	6.21	262.20	87.40	2.12
180	80	6	10	43.9	34.5	0.517	1906.06	211.78	6.59	430.15	107.52	3.13
190	60	8	15	46.6	36.6	0.497	2047.60	215.51	6.69	240.76	80.24	2.27
200	50	6	20	43.0	33.8	0.497	2164.41	216.41	7.09	147.12	58.84	1.85
200	60	8	20	52.7	41.4	0.517	2623.31	262.29	7.06	259.06	86.35	2.22
		10	20	58.9	46.3	0.517	2748.53	274.81	6.83	284.66	94.87	2.20
200	80	8	20	62.4	49.0	0.557	3374.49	337.41	7.35	540.63	135.14	2.94

*) cold produced; s + t > 8–10 mm

**) The cross-sections, weights, surface areas and structural values are computer-calculated from the dimensions given in the table (without warranty). They relate to the mean tolerance specifications.

Standard T-profiles



EQUAL- AND DEEP-WEBBED T-PROFILES

Possible manufacturing processes:

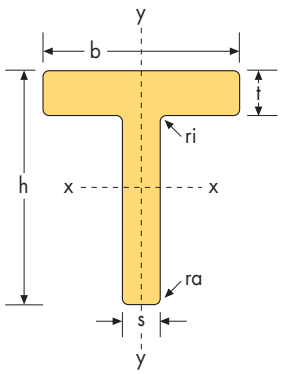
- hot extrusion
- cold drawing
- hot rolling

	Hot	Cold
Corner radii	ra ≈ 1.5 mm	ra ≈ 0.8 mm
Inner radii	ri ≈ 3.0 mm	ri ≈ 1.5 mm

	Dimensions		Thickness		Cross section	Weight	Surface area	x–x Axial distance	Moment of inertia	Moment of resistance		Radius of inertia	y–y Axial distance	Moment of inertia	Moment of resistance	Radius of inertia
	h	b	s	t				e_x	I_x	W_x min	W_x max	i_x	e_y	I_y	W_y	i_y
	mm	mm	mm	mm	cm^2	kg/m	m^2/m	cm	cm^4	cm^3	cm^3	cm	cm	cm^4	cm^3	cm
	50	50	6	10	7.5	5.9	0.193	3.68	13.68	3.77	10.50	1.36	2.5	10.39	4.15	1.18
*)			8	8	7.5	5.9	0.193	3.46	16.70	4.82	10.85	1.49	2.5	8.58	3.43	1.07
			10	10	9.2	7.3	0.193	3.39	19.52	5.75	12.15	1.46	2.5	10.65	4.26	1.08
			15	12	11.7	9.2	0.193	3.19	25.74	8.08	14.19	1.48	2.5	13.49	5.40	1.08
	60	50	8	8	8.4	6.6	0.213	4.08	28.43	6.96	14.72	1.84	2.5	8.62	3.45	1.01
			10	10	10.2	8.0	0.213	4.01	33.82	8.43	16.87	1.82	2.5	10.91	4.37	1.03
			12	10	11.1	8.7	0.213	3.88	37.68	9.70	17.69	1.84	2.5	11.20	4.48	1.00
	60	60	6	10	9.02	7.08	0.233	4.50	24.69	5.48	16.48	1.65	3	18.04	6.01	1.41
*)			8	8	9.2	7.2	0.233	4.21	29.99	7.12	16.75	1.81	3	14.75	4.92	1.27
			10	10	11.3	8.9	0.231	4.14	35.75	8.63	19.24	1.78	3	18.60	6.20	1.28
			12	15	14.5	11.4	0.233	4.12	41.34	10.04	21.97	1.69	3	27.53	9.18	1.38
	62	50	15	12	13.15	10.6	0.217	3.88	48.24	12.42	20.82	1.89	2.5	13.83	5.53	1.01
	70	50	8	8	9.0	7.0	0.236	4.67	43.20	9.26	18.52	2.19	2.5	8.57	3.43	0.98
			10	10	11.02	8.65	0.236	4.59	51.80	11.27	21.53	2.17	2.5	10.89	4.36	0.99
*)	80	50	8	8	10.1	7.9	0.251	5.26	64.00	12.16	23.37	2.52	2.5	8.74	3.50	0.93
			10	10	12.3	9.6	0.251	5.18	76.66	14.79	27.21	2.50	2.5	11.13	4.45	0.95
			15	10	15.6	12.2	0.251	4.81	97.68	20.32	30.59	2.50	2.5	12.46	4.98	0.89
	80	60	8	8	10.9	8.5	0.271	5.44	68.13	12.53	26.58	2.50	3	14.87	5.00	1.17
			10	10	13.3	10.4	0.271	5.36	81.75	15.25	30.95	2.48	3	18.77	6.26	1.19
			12	12	15.7	12.3	0.271	5.28	94.36	17.86	34.74	2.45	3	22.80	7.60	1.20
			15	15	18.9	14.8	0.271	5.18	110.77	21.38	39.28	2.42	3	28.78	9.59	1.23
	90	50	8	8	10.9	8.5	0.271	5.83	88.99	15.26	28.08	2.86	2.5	8.79	3.51	0.90
			10	10	13.3	10.4	0.271	5.75	106.92	18.59	32.9	2.84	2.5	11.21	4.49	0.92
			10	15	15.02	11.79	0.271	6.00	112.43	18.73	37.51	2.74	2.5	16.22	6.49	1.04
*)	90	60	8	8	11.7	9.2	0.291	6.02	94.82	15.74	31.86	2.85	3	14.91	4.97	1.13
			10	10	14.3	11.2	0.291	5.94	114.10	19.19	37.34	2.82	3	18.86	6.29	1.15
			15	15	20.3	15.9	0.291	5.76	155.41	27.00	47.91	2.77	3	28.98	9.66	1.19
	100	50	10	10	14.3	11.2	0.291	6.31	143.73	22.79	38.93	3.17	2.5	11.30	4.52	0.89
	100	60	8	8	12.17	9.71	0.317	6.58	124.85	18.98	36.48	3.20	3	14.78	4.93	1.10
			10	10	15.3	12.0	0.311	6.52	153.43	23.55	44.07	3.17	3	18.95	6.31	1.11
			10	20	20.2	15.9	0.311	6.99	167.94	24.02	55.80	2.88	3.0	36.59	12.20	1.35
			15	30	28.5	22.4	0.313	6.66	221.64	33.28	66.35	2.79	3	55.84	18.61	1.40

*) If applicable hot rolled, limited dimensions.
Supply source and tolerances on request.

Standard T-profiles



EQUAL- AND DEEP-WEBBED T-PROFILES

Possible manufacturing processes:

- hot extrusion
- cold drawing
- hot rolling

	Hot	Cold
Corner radii	ra ≈ 1.5 mm	ra ≈ 0.8 mm
Inner radii	ri ≈ 3.0 mm	ri ≈ 1.5 mm

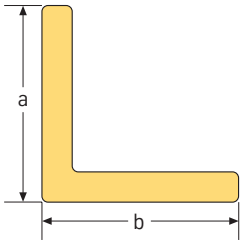
	Dimensions		Thickness		Cross section	Weight	Surface area	x–x Axial distance	Moment of inertia	Moment of resistance		Radius of resistance	y–y Axial distance	Moment of inertia	Moment of resistance	Radius of inertia
	h	b	s	t				e_x	I_x	W_x min	W_x max	i_x	e_y	I_y	W_y	i_y
	mm	mm	mm	mm	cm^2	kg/m	m^2/m	cm	cm^4	cm^3	cm^3	cm	cm	cm^4	cm^3	cm
	110	50	12	10	17.1	13.4	0.313	6.65	208.64	31.38	47.79	3.49	2.5	11.92	4.77	0.84
			15	12	20.7	16.3	0.313	6.50	247.26	38.02	55.0	3.46	2.5	15.18	6.07	0.86
		60	15	15	24.0	18.9	0.341	7.16	311.85	43.53	71.92	3.60	3	29.55	9.85	1.11
		50	10	10	16.4	12.8	0.331	7.40	239.11	32.31	52.00	3.82	2.5	11.48	4.59	0.84
	120	60	8	8	14.1	11.1	0.350	7.72	210.05	27.20	49.11	3.86	3	14.89	4.96	1.03
*)			10	10	17.4	13.6	0.351	7.64	255.19	33.40	58.54	3.83	3	19.12	6.37	1.05
		50	10	10	17.4	13.6	0.351	7.94	298.72	37.62	59.04	4.14	2.5	11.56	4.62	0.82
			15	15	24.9	19.5	0.351	7.74	413.43	53.41	78.63	4.07	2.5	18.86	7.54	0.87
			12	30	27.2	21.3	0.353	8.60	395.32	45.99	89.75	3.81	2.5	32.66	13.06	1.10
		60	10	10	18.3	14.4	0.373	8.18	318.56	38.93	65.93	4.17	3	19.17	6.39	1.02
			15	15	24.4	19.5	0.371	8.00	442.47	55.32	88.462	4.09	3	30.18	10.06	1.07
	140	60	10	10	19.3	15.2	0.393	8.72	389.84	44.71	73.82	4.49	3	19.25	6.42	1.00
			15	15	27.8	21.8	0.393	8.53	543.70	63.74	99.39	4.42	3	30.39	10.13	1.05
		60	15	25	33.0	25.9	0.403	9.30	653.18	70.22	125.64	4.45	3	48.25	16.08	1.21
		50	15	15	27.8	21.8	0.393	8.79	616.95	70.21	99.31	4.71	2.5	19.35	7.74	0.38
		60	10	20	25.4	19.9	0.411	10.07	544.67	54.07	110.56	4.63	3	37.03	12.34	1.21
			15	20	31.5	24.8	0.413	9.37	696.07	74.33	123.52	4.70	3	39.53	13.18	1.12
			20	20	38.0	29.9	0.413	8.87	831.85	93.73	135.82	4.68	3	44.57	14.86	1.08
		50	15	15	29.3	23.0	0.413	9.31	739.67	79.43	110.60	5.02	2.5	19.63	7.85	0.82
			12	30	30.8	24.2	0.413	10.40	725.12	69.70	129.55	4.85	2.5	33.11	13.24	1.04
		60	10	10	21.4	16.8	0.430	9.81	564.65	57.53	91.29	5.14	3	19.34	6.45	1.23
		50	15	15	30.0	23.6	0.432	9.57	806.47	84.24	116.44	5.18	2.5	19.77	7.91	0.95
		60	15	15	31.5	24.7	0.441	9.78	860.00	87.16	129.66	5.23	3	30.96	10.32	0.81
		60	15	15	33.8	26.5	0.473	10.66	1098.14	103.01	149.63	5.70	3	31.51	10.50	0.99
	185	60	20	25	47.0	36.9	0.481	10.69	1562.54	142.58	207.20	5.77	3	55.43	18.48	0.97
		50	12	30	34.5	27.1	0.473	12.15	1189.07	97.9	173.47	5.87	2.5	33.56	13.42	0.99
		60	10	10	24.4	19.2	0.493	11.39	907.38	79.64	119.06	6.10	3	19.69	6.56	0.90
	200	50	15	15	35.3	17.7	0.493	11.39	1384.23	121.53	160.77	6.26	2.5	20.75	8.30	0.77
			20	20	46.0	36.1	0.493	11.18	1758.66	157.26	199.46	6.81	2.5	32.79	13.12	0.84

*) If applicable hot rolled, limited dimensions.
Supply source and tolerances on request.

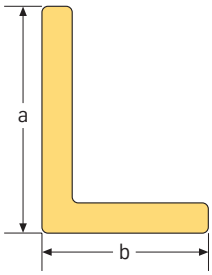
Stainless steel standard profiles

STANDARD PROFILES OF STAINLESS, CORROSION RESISTANT HIGH-GRADE STEELS

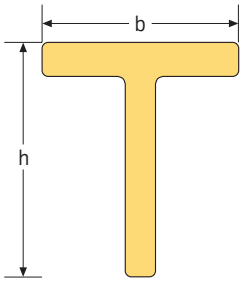
Standard profiles of stainless, corrosion resistant
high-grade steels in order to DIN EN 10 088-3/DIN 17 440



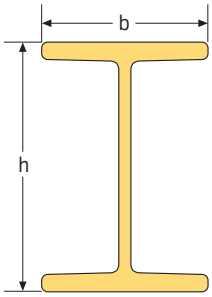
- **Equal angle**
  dimensional range*): 20–200 mm



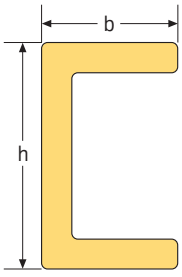
- **Uneqal angle**
  Dimensional range*): 30 x 20 mm to 200 x 150 mm



- **T-profiles, wide flange, equal and deep-webbed**
  Dimensional range*): height = 25–160 mm
  width = 30–140 mm



- **I-beams, narrow and wide flange (similar to DIN 1025)**
  Dimensional range*): height = 80–450 mm
  width = 60–260 mm



- **U-profiles**
  Dimensional range*): 30 x 15 mm to 400 x 110 mm

*) Thickness depending on profile circumscribed circle and material

Material and manufacture

- Production
- Further processing
- Materials
- Quality Control

Production

"TO SET A STANDARD MEANS TO EXHAUST ALL PRACTICAL AND ACCEPTABLE PRACTICES."

Charles-Edouard Jeanneret (Le Corbusier)

Run-out of the profile bar after extruding through a forming die.

At our location in Schwerte, special profiles are

- hot rolled
- hot extruded
- cold drawn

The various profiling processes make it possible to form the material in such a way that it fulfils the relevant economical, structural and optical conditions. As a result of the differently structured production facilities used, even small volumes of special profiles can be produced economically.

We produce special profiles in all forms, qualities and surface finishes, as required for the intended application.

The result – special profiles with the following product advantages:

- sharp edges (external radii of c. 1.5 mm hot extruded to c. 0.8 mm cold drawn)
- seamless finish for solid and hollow profiles (homogenous grain structure and no danger of leakage), thus particularly suited for heated façades
- different material thicknesses within a profile cross-section (advantage: low construction depth with the same structural characteristics)
- integration of grooves to take seals
- surface smoothing by means of cold drawing
- economical production resulting from low tooling costs even for small batch sizes

Special profiles for façade construction.

Production
Hot extrusion

Extruding a heated steel billet with a ram exerting a force of about 2,200 tonnes.

Hoesch Schwerter Extruded Profiles GmbH is thus far the only company in Germany to operate a hot extrusion press for the production of steel profiles. For this process, a steel billet is heated to around 1,250°C in a rotary hearth furnace under inert gas. After leaving the furnace, the billet is coated in glass powder for transport to the extrusion press. A hydraulic ram with a pressure of around 2,200 tonnes then forces the workpiece through the forming die, which is fitted with a glass disk, to form an extruded profile.

Advantages of hot extrusion:

- manufacturing of complex profile forms
- profiles possible even in metallic materials which are difficult to form
- economic production even of small batch sizes

Dimensions:
- circumscribed circle for solid and hollow profiles up to 255 mm diameter
- inner diameters or diagonals for hollow profiles of at least 20 mm to a maximum of 160 mm
- minimum wall thickness: 4 mm

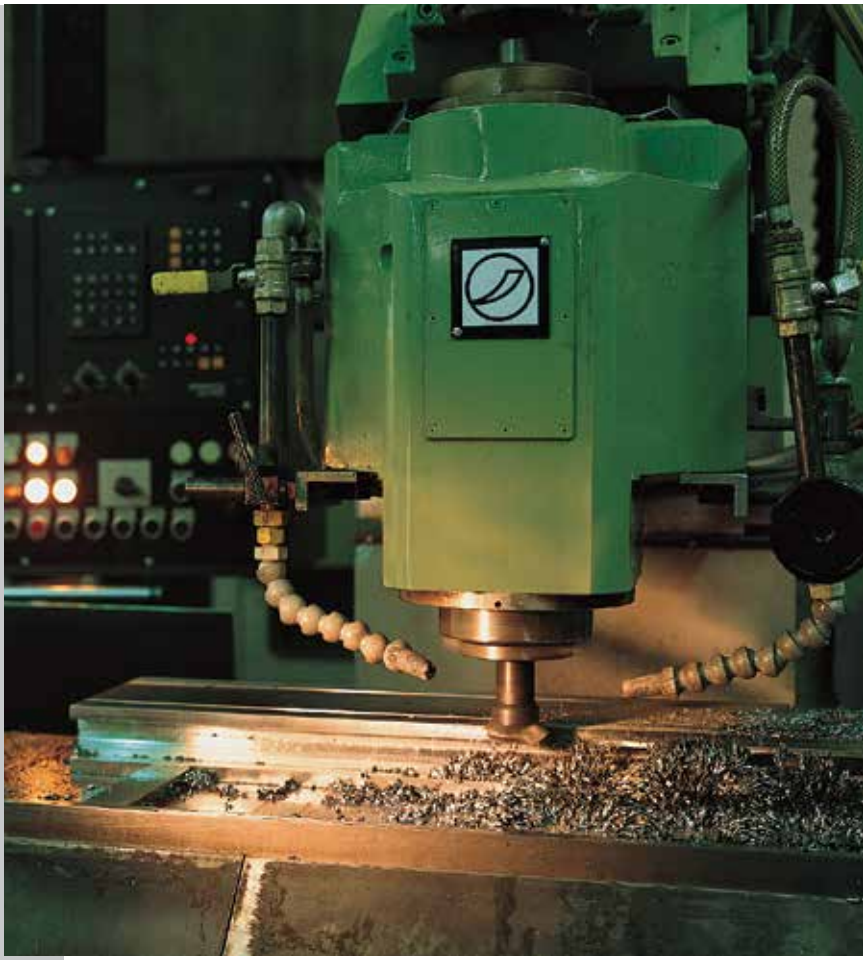
Lengths:
- up to c. 16,800 mm (depending on profile cross-section, with sawn ends, fixed lengths by agreement)

Metre weight:
- up to max. 110 kg/m

Further processing

"A BUILDING IS LIKE AN INSTRUMENT. IT MUST TAKE UP ALL POSITIVE INFLUENCES AND REJECT ALL NEGATIVE INFLUENCES THAT COULD AFFECT THE PEOPLE."

Alvar Aalto



Fulfilling individual customer requirements, for example by the use of computer-controlled CNC milling systems.

To round off and complete our range of offerings, we also offer our customers if necessary, in co-operation with experienced partners the execution of additional machining steps, including:

- sawing
- milling
- turning
- grinding
- welding
- drilling
- thread cutting
- heat treatment
- surface finishing (e.g. galvanising, electro-galvanising, spray galvanising, sandblasting, priming)

Materials

"FORM FOLLOWS FUNCTION."
Louis Henry Sullivan

Hoesch Schwerter Extruded Profiles GmbH produces special profiles from structural and high quality steels as well as high and low alloyed stainless steels of the highest quality.

We create customer-specific alloys and carry out individual materials treatments by agreement, e.g. stress-relieved annealing, annealing, normalising, tempering.

We currently have official approvals for the following materials:

General construction steels

Standard	Material No.	Short name
DIN EN 10 025	1.0036	S235JRG1
DIN EN 10 025	1.0037	S235JR
DIN EN 10 025	1.0038	S235JRG2
DIN EN 10 025	1.0114	S235J0
DIN EN 10 025	1.0116	S235J2G3
DIN EN 10 025	1.0044	S275JR
DIN EN 10 025	1.0143	S275J0
DIN EN 10 025	1.0144	S275J2G3
DIN EN 10 025	1.0145	S275J2G4
DIN EN 10 025	1.0553	S355J0
DIN EN 10 025	1.0570	S355J2G3

Tempered steels

Standard	Material No.	Short name
DIN EN 10 083-2	1.0501	C35
DIN EN 10 083-2	1.0503	C45
DIN EN 10 083-1	1.7225	42CrMo4

Stainless steels

Standard	Material No.	Short name
DIN EN 10 088-3	1.4301	X5CrNi18-10
DIN EN 10 088-3	1.4401	X5CrNiMo17-12-2
DIN EN 10 088-3	1.4404	X2CrNiMo17-12-2
DIN EN 10 088-3	1.4462	X2CrNiMoN22-5-3
DIN EN 10 088-3	1.4541	X6CrNiTi18-10
DIN EN 10 088-3	1.4571	X6CrNiMoTi17-12-2

On request, we can also use steel materials not listed here. However, in these cases, an official approval must be obtained.

Quality Control

"DESIGN AND BEAUTY DO NOT HAVE TO BE OPPOSITES." *Gerrit Rietveld*

At Hoesch Schwerter Extruded Profiles GmbH, quality assurance measures accompany the procurement of precursor material just as they do the entire production process. In order to do justice to the requirements of our customers, a variety of both test possibilities and qualified inspection personnel are available. Both Quality Management and the Research and Development division work in laboratories outfitted with modern equipment and carry out chemical, electro-chemical, physical, mechanical, metallographic and metallurgical inspections.

Hoesch Schwerter Extruded Profiles GmbH is certified according to national and international standards including but not limited to the following:

- DIN EN ISO 9001
- DIN EN 9100
- DIN EN ISO 14001

In addition to this, the company has a licence for the inspection of structural products for general construction steels under DIN EN 10 025 and for tempered steels under DIN EN 10 083-1 and 2. Our stainless steels also conform to the applicable technical specifications of the general construction permit no. Z-30.3-6 and DIN EN 10088-3. All production processes in steel processing are linked to influences on the environment. For more than thirty years, Hoesch Schwerter Extruded Profiles GmbH has engaged in active environmental conservation to minimise these effects on the protection worthy assets of water, air and soil.

Every production process is examined regularly with regard to its impact on the environment and adjusted appropriately, in a process of continual improvement. When planning new facilities, the environmental effects are examined in advance and minimised as far as technically possible. The existing environmental protection system was adapted to the international standard DIN EN ISO 14001 and independently certified in separate procedures for all plants.

In dialogue

- Your contact points
- Fax enquiry

In dialogue

"I BELIEVE THAT ARCHITECTURE IS ABOUT PEOPLE ."

Sir Norman Foster

Whether standardised or freely selected profile cross-sections which correspond to the design "language" of a building or the ideas of an architect, or whether conventional production or a special profile – the more economically sensible solution in each case can best be established in discussion with our experienced application consultants. Talk to us to match up your requirements for the construction part to our many profiling possibilities.

+49 (0) 2304 / 106-389
info@hoeschsep.com

We can prepare particularly well for a discussion with you if you use the attached checklist for you enquiry.

Special Profiles for façade construction
Enquiry checklist

Fax +49 (0) 23 04 106-274

construction project:

_____

_____

_____

production timescale:

_____

☐ draft phase

☐ design phase

dimensions/specific characteristics:

_____

_____

_____

_____

_____

_____

_____

material: _____

lengths used: _____

requirement in metres or tonnes: _____

desired delivery date: _____

sketches:

indicate functional sizes if appropriate

_____
company

_____
contact person

_____
country/Street address

_____
postcode and town

_____
telephone

_____
fax

_____
e-mail

_____
Date/Signature

HOESCH SCHWERTER EXTRUDED PROFILES GmbH

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