

Steel 09G2S/CT 09Г2С Technical Specification

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09G2S also known as 09Г2С, which is a GOST carbon steel grade, an **unalloyed low carbon structural steel**.

Understand the designation 09G2S as below

- 09 – refers to 0.09 % carbon content as typical value
- G2 – max. 2 % manganese content;
- S – max. 1.0 % silicon content.

The Chemical composition and mechanical property are specified in [GOST 19281](#) 2014, a GOST standard for ROLLED STEEL WITH ENHANCED STRENGTH.

Is there any grade to replace GOST 09G2S in ASTM or EN standard?

The Answer is no..there isn't exact the same grade with 09G2S. But we can find the **Equivalent** grade (similar mechanical property)

The most important character of 09G2S is to have the Good impact testing value at low temperature -40 ° C

Equivalent (approximate):

- **EN standard:** S355J2 or S355N (not exact, but similar in strength and application).
 - GB Q355E
- Chemical composition of steel 09G2S (melt analysis)

C	Si	Mn	Ni	S	P	Cr	V	N	Cu	As
max 0.12	0.5 – 0.8	1.3 – 1.7	max 0.3	max 0.035	max 0.03	max 0.3	max 0.12	max 0.008	max 0.3	max 0.08

Mechanical properties under T=20°C for grade 09G2S (09Г2С)

Assortment	Dimension	Direct.	σ_s	σ_T	δ_5	ψ	KCU	Heat treatment
–	mm	–	MPa	MPa	%	%	kJ / m ²	–
Sheet, GOST 5520-79			430-490	265-345	21		590-640	
Pipe, GOST 10705-80			490	343	20			
Bars	to 250		430	265	21			

Impact Test Requirements (GOST 19281-89 for 09G2S):

The **impact test** of **09G2S steel** is a critical parameter, especially because this material is widely used in **low-temperature environments** such as pipelines and structural applications in low temperature.

- At **-40° C**, the material must typically show **not less than 34 J** average energy absorption for 3 specimens.
- Fracture appearance: Often $\geq 50\%$ ductile fracture surface is also required at that temperature.

09G2S/CT 09Г2C Product-Specific Standards:

Product Type	GOST Standard(s)	Description
Plates	GOST 19903, GOST 19281	Hot-rolled steel plates and sheets
Pipes	GOST 8732 (seamless), GOST 10704 (welded)	Steel pipes for general and pressure use
Flanges	GOST 12820, GOST 12821, GOST 12822, GOST 33259	Weld neck, flat, loose flanges for pipelines
Forgings	GOST 8479, GOST 25054	General forgings and semi-finished parts
Bars/Rods	GOST 2590, GOST 535	Hot-rolled round and square steel bars
Structural Steel	GOST 8239, GOST 8509, GOST 8510	I-beams, angles, channels for construction