

Weldability of steels

Weldability can be defined as the capability of metal to be welded under the fabrication conditions imposed satisfactorily on the intended surface.

Factors affecting weldability:

- steel composition
- processing
- pre and post-weld processing
- surface condition

Tab.1: Categories of weldability

Grade	Marking	Warranty	Example of use
VERY HIGH	1a	guaranteed the good weldability for ambient temperatures down to 0 ° C	for dynamically stressed welds even at lower temperatures
HIGH	1b	the weldability is guaranteed under the predetermined conditions specified in the steel standard, eg. pre-heating: carbon steel: 150-250 ° C, alloy steel: 250-400 ° C	for statically stressed welds
GOOD	2	the weldability is not guaranteed	inferior welds; statically stressed constructions; for repairs
LOW	3	it is not possible to achieve satisfactory weld quality	it is not recommended to be used for welding, for necessary repairs only

Tab.2: Weldability of class:

Class	Steel	Weldability
Class 4.8	- low-carbon steel or carbon steel	2- GOOD
Class 5.6	- low-carbon steel or carbon steel	2- GOOD
Class 5.8	- low-carbon steel or carbon steel	2- GOOD
Class 8.8	- carbon steel or alloy steel - quenched and tempered	3 - LOW
Class 10.9	- carbon steel or alloy steel - quenched and tempered	3 - LOW
Class 12.9	- alloy steel - quenched and tempered	3 - LOW
Class A2 (stainless steel)	- austenitic stainless steel	2- GOOD
Class A4 (stainless steel)	- austenitic stainless steel	2- GOOD

Tab.3: Weldability of used materials:

Material / Steel	Marking of steel	Weldability
Steel S235	S235JR (1.0038)	1a - VERY HIGH
Steel S355	S355J2 (1.0577)	1a - VERY HIGH
Free cutting steel	11SMnPb37 (1.0718)	3 - LOW
Free cutting steel	11SMn30 (1.0715)	3 - LOW
Stainless steel (for machining)	AISI 303 (1.4305)	3 - LOW
Trapezoidal thread rods C15	C15 (1.1141)	1a - VERY HIGH
Trapezoidal thread rods C45	C45 (1.0503)	3 - LOW
Stainless steel	AISI 304 (1.4301)	1b- HIGH
Stainless steel	AISI 316 (1.4401)	1b- HIGH

Notice:

These tables are only of basic informative character about used steels and welding. Company Valenta ZT Ltd. assumes no responsibility for inappropriate use or misinterpretation of the information presented herein.

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