

Weldability

Capacitor Discharge “CD”

Weldability

The general welding properties of Studfast “CD” weld studs are given in the table above. Select from the 1st column in the table your product parent material then read across to the column corresponding to the weld stud material. The general welding properties of the 2 materials is then given to enable you to evaluate the compatibility of your selection.

Parent Material

The welding properties of Studfast “DA” weld studs is dependant upon the condition of the parent material. The best quality parent material should be used wherever possible to eliminate the possibility of weld failures. When welding Mild Steel studs cold rolled material should ideally be used.

Parent Material	Stud Material				
	Mild Steel	Stainless Steel	Aluminium Alloy	Pure Aluminium	Brass
Low Carbon Mild Steel	Good	Good	Not Weldable	Not Weldable	Good
Steel up to 0.6% carbon	Fair	Good	Not Weldable	Not Weldable	Good
Austenitic Stainless Steel	Good	Good	Not Weldable	Not Weldable	Fair
Zinc Coated Steel	Fair	Fair	Not Weldable	Not Weldable	Good
Electro Galvanised Steel	Fair	Fair	Not Weldable	Not Weldable	Good
Hot Rolled Structural Steel	Fair	Fair	Not Weldable	Not Weldable	Fair
Aluminium Alloy	Not Weldable	Not Weldable	Good	Good	Not Weldable
Pure Aluminium	Not Weldable	Not Weldable	Good	Good	Not Weldable
Lead Free Brass	Good	Fair	Not Weldable	Not Weldable	Good
Lead Free Copper	Fair	Fair	Not Weldable	Not Weldable	Good
Leaded Brass	Not Weldable	Not Weldable	Not Weldable	Not Weldable	Not Weldable

The use of hot rolled Mild Steel should be avoided if possible as “CD” weld studs may under certain conditions and in certain applications pull laminations out of the parent material when loaded. The “DA” or “SCDA” welding process should be considered if the parent material is hot rolled Mild Steel and the stud diameter exceeds 6mm.

Stud Material

Studfast “CD” Weld studs are manufactured from the materials shown in the table and conform to the latest DIN specifications

Mild Steel	BS3111 1979 type 0 DIN ISO898 pt 1 ST 37-3
Stainless Steel	304Cu to BS3111 1979 Type 2
Aluminium Alloy	AlMg3 to BS1476
Brass	70/30 Lead free to BS2873 BS2874

Reverse Marking

With “CD” Studwelding there should be little or no reverse marking evident. However this is dependant upon stud diameter, parent material thickness, type & condition. Should you have any concerns regarding the extent of this marking Studfast would be pleased to carry out weld tests on sample material and provide free advice.

The table opposite and the graph below provide the minimum loads to fracture for good Capacitor Discharge “CD” welds, where Studfast “CD” weld studs have been used and where the parent material is of a good weldable quality.

Stud Location

The weldability of and “CD” weld stud is also dependant upon the length of the weld pip. This is particularly so when welding to coated or electro-galvanised materials where studs with pips of the correct length must be used. Location by use of manual centre punch marks should be avoided as this has the effect of reducing the pip length and the total energy in the weld. For accurate stud location the use of templates is recommended.

Weld Testing

The strength of a “CD” weld on your material can be determined by the use of destructive and non destructive tests. These are detailed in the appropriate data sheet but comprise of bend tests, visual tests and torque testing.

Stud Diameter	Mild Steel	Stainless Steel	Aluminium Alloy	Brass
M3	2.00 kN	3.25 kN	0.75 kN	1.40 kN
M4	4.00 kN	5.50 kN	1.00 kN	2.20 kN
M5	6.25 kN	8.25 kN	1.75 kN	4.00 kN
M6	10.00 kN	13.00 kN	3.15 kN	6.50 kN
M8	14.00 kN	18.80 kN	5.50 kN	9.25 kN

