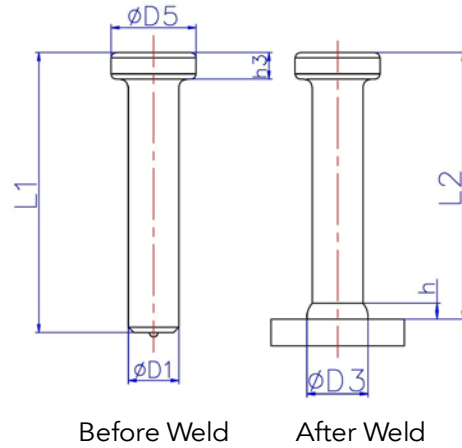


- Shear Connector | Shear Studs
- Ceramic Ferrule
- Stud Welding Machine



DIMENSION

Standard: ISO 13918, AWS D1.1, AWS D1.5, BS 5400, AS/NZS 1552.4, JIS B 1198



DIMENSION (Unit: mm)							Flux	
D1	L1	D5	h3	D3*	h*	L1 Burn off*	Depth max.	Height Min.
10	27 - 155	18	7	13	2.5	3	1	0.7
13	27 - 155	22	8	17	3	3	1	0.7
16	50 - 155	32	8	21	4.5	4	1	0.7
19	75 - 255	32	10	23	6	4.5	1.4	1.15
22	100 - 255	35	10	29	6	5	1.4	1.15
25	100 - 255	41	12	31	7	5.5	1.4	1.15

Note: *denotes estimate value
L2 = L1 - L1 Burn off

MATERIAL & MECHANICAL PROPERTIES

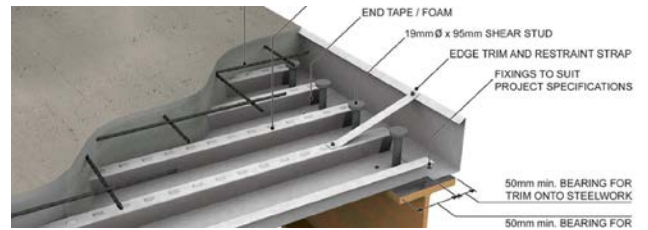
Materials	Mild Steel SWRCH18A / ML15Al	Stainless Steel 304HC / 316Cu
Tensile strength min.	450N/mm ²	500N/mm ² - 780N/mm ²
Yield strength (R _{p0.2}) min.	350N/mm ²	350N/mm ²
Elongation (A5) min.	15%	20%
Wire surface treatment	Phosphate plating	Film coating

SINOARS Shear Connector Advantages

Features	Advantages
★ Phosphated steel wire	Anti-rust, high precision forming, High-light surface
★ Max. Depth 1.6mm aluminum flux	Avoid weld joint stoma, improve weld strength
★ Automatic flux installation technology	High consistent flux, improve weld quality
★ Fat weld end with round chamfer	Avoid arc-blow effect probability
★ 0.4mm depth of head-mark area	Offer maximum vertical shear force

What's shear connector?

Shear Connector are typically used in composite steel construction to tie the concrete slab to steel members and resist shear force between the concrete slab and steel members. It's one of a classic application of drawn arc stud welding technology. It is widely used in steel constructions, bridges, power station, traffic station, oil and gas station, etc.



3 Factors of shear connector



Cheese Head

- Effective thickness of stud head offer vertical shear force against the concrete slab.
- Stud chuck hold and electric conduct during the welding process.
- Precision diameter of stud head match the stud chuck, provide consistent weld quality.

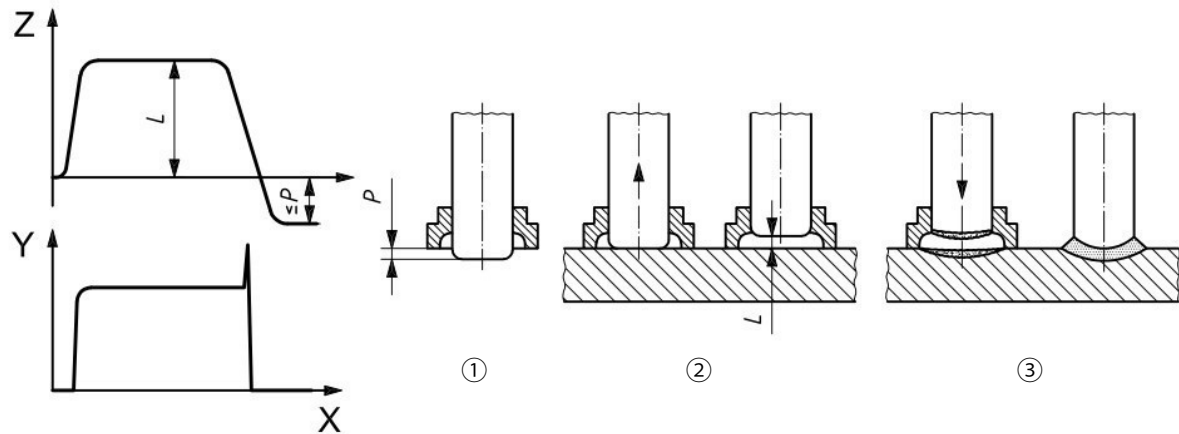
Flux

- Essential factor for drawn arc stud welding.
- Flux depth is important to prevent stoma of the welding joint.
- Complete same flux assures consistent welding quality.
- The aluminum element is important for cleaning the weld area and helpful for weld bath killed.

Shank

- Offer horizontal shear force against the concrete slab.
- Absolutely not less than standard diameter which is great importance to match the design force requirement.
- There should be no oil or rust at least 50mm at the welding end.

THE PROCESS OF SHEAR CONNECTOR DRAWN ARC STUD WELDING



P: Protrusion L: Lift X: Weld Time Y: Weld Current Z: Stud Movement

THE APPLICATION SCOPE OF SHEAR CONNECTOR STUD WELDING

Weld Process	Weld Time	Diameter and Weld Position	Weld Current	Weld Pool Protection	Min. Sheet Thickness
Drawn arc stud welding with ceramic ferrule	> 200ms	10 - 25 PA 10 - 19 PE 10 - 16 PC	800A - 3000A	CF	0.25d

PA: Flat welding position; PC: Horizontal welding position; PE: Overhead welding position

QUALIFIED



Stud Base qualified by TÜV SÜD



ISO9001:2015 QMS certified by SGS
Certificate Number: CN18/10222



Factory Production Control certified by DNV-GL

WHAT MAKE US UNIQUE



0.01mm

High precision multistage cold formed ensure high precision and consistent studs dimension.
Complete flat weld end with round chamfer.

360°

High precision dimension make the studs easy to load into the weld gun chuck and hold tight properly.
Flat weld end with round chamfer make the studs easy to insert into the ceramic ferrule hole, offer 360° weld collar.

490Mpa

Made by high quality phosphate plating mild steel wire, ensure studs mechanical properties and welding properties, absolutely without cracks.
Over 490MPa tensile strength match the requirement of steel bridge's code.

1.4mm

Accurate calculated aluminium flux embedded by unique technology, fix into the stud weld end with only 1.4mm depth.
Consistency ensure the welding quality and avoid cavities in the weld joint.

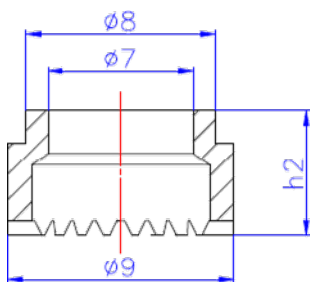


Ceramic Ferrules are essential parts of the standard drawn arc stud welding process. In the process, the shear connectors are inserted into the center of hole of the ceramic ferrule, the ferrule will be pressed on the welding surface by ceramic ferrule holder with the force of spring device inside the stud welding gun. The ceramic ferrule is used for one weld only and is removed once the molten metal has solidified. It has following functions:



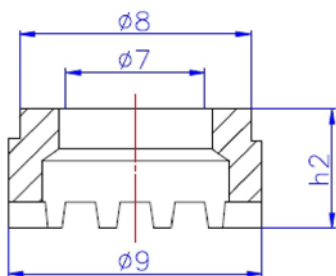
- Protection of the weld pool by creation of metal vapour in the burning chamber at sufficient current intensity.
- Concentration and stabilization of the arc, thus reducing arc blow sufficient current intensity.
- Moulding of the displaced weld pool to a weld collar and supporting of the weld pool, furthermore, it shields the operator from both arc and spatter.

ISO 13918 : 2008 TYPE UF



Specification	Dimension					Pieces per Carton
	D7		D8 ± 1	D9 ± 1	h2 ≈	
	Min.	Max.				
UF10	10.2	10.7	15	17.8	10	1,000
UF13	13.1	13.6	20	22.2	11	900
UF16	16.3	16.8	26	30	13	500
UF19	19.4	19.9	26	30.8	16.7	400
UF22	22.8	23.3	30.7	38.5	18.5	200
UF25	26.0	26.5	35.5	41	21	200

WELD THROUGH DECK TYPE WTD



Specification	Dimension					Pieces per Carton
	D7		D8 ± 1	D9 ± 1	h2 ≈	
	Min.	Max.				
WTD13	12.9	13.4	19	25	13	900
WTD16	16.3	16.8	26.1	30.6	15.8	400
WTD19	19.4	19.9	30.7	33.5	15	400
WTD22	22.9	23.4	33	39	19	250
WTD25	26.2	26.7	36	41	19	200

Advantages of SINOARS® Arc Stud Welding Technology

SINOARS® Arc Stud Welding Technology can weld studs, shear connectors with diameter from 8mm-25mm to workpiece within very short time. Some traditional welding processes like drilling, tapping, manual welding and so on are omitted in certain areas, which is significant for improving efficient and getting stable welding effects. They are widely used in steel reinforced concrete structures, steel constructions, shipbuilding, vehicle constructions, refractory industry and so on.

- Very high degree of safety, thanks to cross-sectional joints
- High productivity through extremely short welding time
- Distortion reduced to a minimum through low thermal stress
- One side welding, very little or no damage to the reverse side
- Easy to operate for personnel trained on the job



Welding Technology

Drawn Arc Stud Welding

Instructions

Output   Input  

Necessary Spare Parts

SAG Welding Gun
Shear Stud Chuck
Ceramic Ferrule Holder

SDA Advantages

- Ideal for shear connector welding.
- Adjust welding current and welding time precisely to get stable welding effects.
- Prevent repeat welding function.
- Over-load protection.
- Automatically compensate for voltage fluctuations.
- Optimized forward after the air diversion structure, heat dissipation stability, to avoid high-intensity work overheating overload.
- PIS single chip microcomputer or DSP digital chip.

SDA Series SCR Arc Stud Welding Machine Technical Data

Model No.	SDA-1600	SDA-2500	SDA-3150
Weldable stud range \varnothing (mm)	8 - 16	10 - 22	13 - 25
Welding current setting range (A)	200 - 1600	400 - 2500	600 - 3150
Welding time setting range (ms)	100 - 2800		
Max stud / min at.. (PC) / Stud dia (\varnothing mm)	24/8 6/16	24/10 6/19	25/13 6/25
Main circuit	Fully Controlled Thyristor Bridge		
Controlling circuit	Micro Processor		
Prevent repeat welding function	Self-Protection		
Voltage (v)	3 Phase 415V 50Hz		
Allowed voltage fluctuation range	$\pm 10\%$		
Three-phase four-core power cable specifications	1*10mm ² + 3*16mm ²	1*10mm ² + 3*25mm ²	1*10mm ² + 3*35mm ²
Controlling cable specifications	4 (4*1mm ²)		
Ground cable (m)	5		
Max extra welding cable (m)	50		
Class of protection	IP23		
Cooling	Wind		
Chassis material	Steel + spray coating		
Lockable universal wheel	2		
Fixed wheel	2		
Handle	Standard		
Lifting ring	2		
Weight (kg)	245	340	370
Sizes: Length X Width X Height (mm)	920 X 470 X 650	1000 X 570 X 680	1000 X 570 X 680
Standard welding gun	SAG3		
Accessories included	3 sets of stud chuck & ferrule holder of your choice		
SAG Stud Welding Gun			
Weight (kg)	2.5		
Weldable stud range (mm)	8 - 25		
Welding gun cable length (m)	2		
Extension welding cable (m)	10		
Damper	Standard		
Lifting range (mm)	1 - 10		

SDAi Series Inverter Arc Stud Welding Machine Technical Data

Model No.	SDAi-1600	SDAi-2500	SDAi-3150
Weldable stud range \varnothing (mm)	8 - 16	10 - 22	13 - 25
Welding current setting range (A)	100 - 1600	200 - 2500	200 - 3150
Welding time setting range (ms)		400 - 3000	
Max stud/min at... (PC) / Stud dia (\varnothing mm)	24/8 6/16	24/10 6/19	25/13 6/25
Main circuit		IGBT	
Controlling circuit		PIC / DSP	
Prevent repeat welding function		Self-Protection	
Voltage (v)		3 Phase 415V 50Hz	
Allowed voltage fluctuation range		$\pm 10\%$	
Three-phase four-core power cable specifications	1*10mm ² +3*16mm ²	1*10mm ² +3*25mm ²	1*10mm ² +3*35mm ²
Controlling cable specifications		4 core (4*mm ²)	
Ground cable (m)		5	
Max extra welding cable (m)		50	
Class of protection		IP23	
Cooling		Wind	
Chassis material		Steel + spray coating	
Lockable universal wheel		2	
Fixed wheel		2	
Handle		Standard	
Lifting ring		2	
Weight (kg)	60	90	98
Sizes: Length X Width X Height (mm)	640 X 440 X 570	700 X 440 X 740	700 X 440 X 800
Standard welding gun		SAG3	
Accessories included		3 sets of stud chuck & ferrule holder of your choice	

SAG Stud Welding Gun

Weight (Kg)	2.5
Weldable stud range (mm)	8 - 25
Welding gun cable length (m)	2
Standard extension welding cable (m)	10
Damper	Standard
Lifting range (mm)	1 - 10

Recommended Welding Table

Stud Diameter (mm)	SDA-1600 SDAi-1600		SDA-2500 SDAi-2500		SDA-3150 SDAi-3150	
	Welding Time (secs)	Welding Current (Amp)	Welding Time (secs)	Welding Current (Amp)	Welding Time (secs)	Welding Current (Amp)
M13	0.9	1100	0.9	1100	0.9	1100
M16	1.0	1300	1.0	1300	1.0	1300
M19			1.15	1900	1.15	1900
M22					1.25	2300
M25					1.75	2800

Note : Welding time and current recommended are subjected to local electricity/current supply. It is advisable to test piece before mass welding.

Recommended Lift and Protrusion of Welding Gun

Stud Diameter (mm)	SDA-1600 SDAi-1600		SDA-2500 SDAi-2500		SDA-3150 SDAi-3150	
	Lift (mm)	Protrusion (mm)	Lift (mm)	Protrusion (mm)	Lift (mm)	Protrusion (mm)
M13	8-9mm	3-4mm	8-9mm	3-4mm	8-9mm	3-4mm
M16	8-9mm	3-4mm	8-9mm	3-4mm	8-9mm	3-4mm
M19	8-9mm	3-4mm	8-9mm	3-4mm	8-9mm	3-4mm
M22	8-9mm	3-4mm	8-9mm	3-4mm	8-9mm	3-4mm
M25	8-9mm	3-4mm	8-9mm	3-4mm	8-9mm	3-4mm

Steel Bridge Structure



In modern steel bridge fabrication, shear connectors are widely used.

Steel STC Bridge Floor



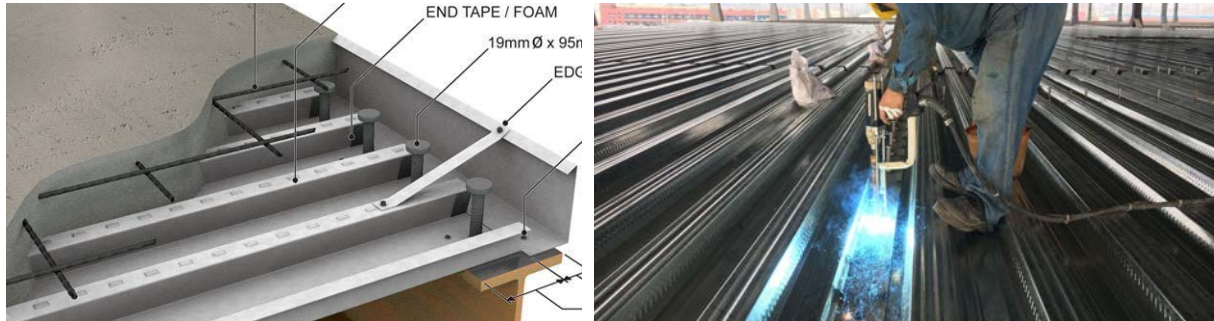
In advanced Steel-STC bridge floor fabrication, $\Phi 13 \times 27$ to $\Phi 13 \times 38$ shear studs are widely used.

LNG Station Fabrication



LNG station fabrication uses highest standard SINOARS shear connectors, $\Phi 19 \times 150$ and $\Phi 16 \times 150$.

Steel Building Floors Through Deck Welding



A typical application of shear connectors, it is used for weld through metal deck to steel beams to resist shear force between concrete slab and steel beams.

Steel Structure Beams & High-Rise Steel Structure Stiffened Column



Shear Connectors weld to steel beams directly, laying composite deck and concreting. In this condition, the shear connectors usually process weld in steel structure plant.

Nuclear Power Station Fabrication



SINOARS shear connectors are used in nuclear power station fabrication, $\Phi 19 \times 150$ and $\Phi 16 \times 150$

YEAR



Location : Kiev, Ukraine
Project : Sky Tower
Type : Business Building

2013



2016



Location : Ho Chi Minh, Vietnam
Project : Nga6-go Vap Overpass
Type : City road Overpass



Location : Auckland, NZ
Project : NZICC
Type : Convention Center

2017



2017



Location : Auckland, NZ
Project : Commercial Bay
Type : Shopping Center



Location : Cairo, Egypt
Project : Nile Bridge
Type : Cross Rive Bridge

2018



2018



Location : Chengdu, China
Project : Longwan Bridge
Type : STC Bridge



Location : Chengdu, China
Project : Junshan BRidge
Type : STC Bridge

2018



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