



المهارة الذكية
Smart Skill

MATERIAL SAFETY DATA SHEET (MSDS)

Headed Shear Stud Connectors
(Type B) & Ceramic Ferrule

ISO 13918 | AWS D1.1 | ASTM A1044/A1044M



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Section 1 - Product & Company Identification

Field	Information
Product Name	Headed Shear Stud Connector (Type B) - Carbon / Stainless Steel; with integral aluminium welding flux; supplied with ceramic ferrule
Product Use	Welded shear connector for composite steel-concrete construction
Manufacturer / Supplier	Smart Skill Contracting Est., C.R. 7016908217, Sari Street, As Salamah, Jeddah 23436, Saudi Arabia
Emergency Contact	Contact Smart Skill technical department during business hours

Section 2 - Hazards Identification

HAZARD CLASSIFICATION SUMMARY — ISO 13918 TYPE B SHEAR STUD				
PHYSICAL STATE  SOLID ARTICLE Manufactured steel stud Not a preparation/mixture	TRANSPORT  NOT DANGEROUS No DG classification IATA / IMDG / ADR	FLAMMABILITY  NON-FLAMMABLE Solid steel article No fire/explosion risk	WELDING HAZARDS  PRESENT DURING WELDING ONLY Arc - Fume - UV - Spatter	ENVIRONMENT  NOT HAZARDOUS Inert solid article No ecotoxic risk

Hazard classification summary - NOT classified as hazardous in supplied (unwelded) form

The finished stud connector is a solid manufactured steel article and is NOT classified as hazardous under normal handling, storage, or use. Hazards arise only during the welding process.

- Physical hazard: sharp edges / heavy items - risk of cuts or impact injury during handling.
- Welding hazard: arc flash (UV/IR radiation), molten metal spatter, and metal fume generation during the drawn-arc welding process.
- Not flammable, not reactive, not classified as a dangerous good for transport (IATA / IMDG / ADR).

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Section 3 - Composition / Information on Ingredients

Component	Approx. %	CAS No.
Iron (Fe) - steel matrix	≥ 96%	7439-89-6
Carbon (C)	< 0.20%	7440-44-4
Manganese (Mn)	< 1.0%	7439-96-5
Aluminium (Al) - weld-end flux charge	< 1% (localised)	7429-90-5
Chromium / Nickel (stainless grades only)	16–20% / 8–12%	7440-47-3 / 7440-02-0

Section 4 - First Aid Measures

Exposure Route	First Aid Action
Skin / Cuts	Wash wound with clean water; apply standard first aid. Seek medical attention for deep cuts or embedded particles.
Eyes (arc flash)	Do not rub. Rest eyes in a darkened room. Seek medical attention if irritation, pain, or visual disturbance persists (welder's flash).
Inhalation (weld fume)	Remove to fresh air immediately. If breathing is difficult, seek medical attention. Do not return without adequate PPE.
Burns (molten spatter)	Cool under cold running water for ≥10 min. Cover with sterile dressing. Seek medical attention for any significant burn.

Section 5 - Fire-Fighting Measures

The shear stud connector is a solid, non-combustible steel article and will NOT burn or support combustion.

- Suitable extinguishing media: all types (CO₂, dry powder, foam, water spray) for adjacent fires.
- During welding, treat as hot-work: remove combustibles from a minimum 3 m radius, post a fire watch, and keep a fire extinguisher immediately available.
- Follow the project hot-work permit procedure at all times.



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Section 6 - Accidental Release Measures

Not applicable to the solid article under normal storage and handling. In the unlikely event of flux powder spillage (damaged carton):

- Do NOT use compressed air - sweep or vacuum up carefully to avoid dust generation.
- Collect in a sealed container and dispose of as inert solid waste per local regulations.
- No special environmental precautions required; material is not classified as an environmental hazard.

Section 7 - Handling & Storage



Correct storage conditions - protect from moisture to maintain weld-end flux integrity

- Handle with cut-resistant gloves; use mechanical lifting aids for bulk cartons.
- Store in original moisture-resistant packaging, in a dry, covered area, off the ground on pallets.
- Keep ceramic ferrules in original packaging to prevent breakage and moisture absorption.
- No special temperature, fire, explosion, or reactivity precautions required for storage.

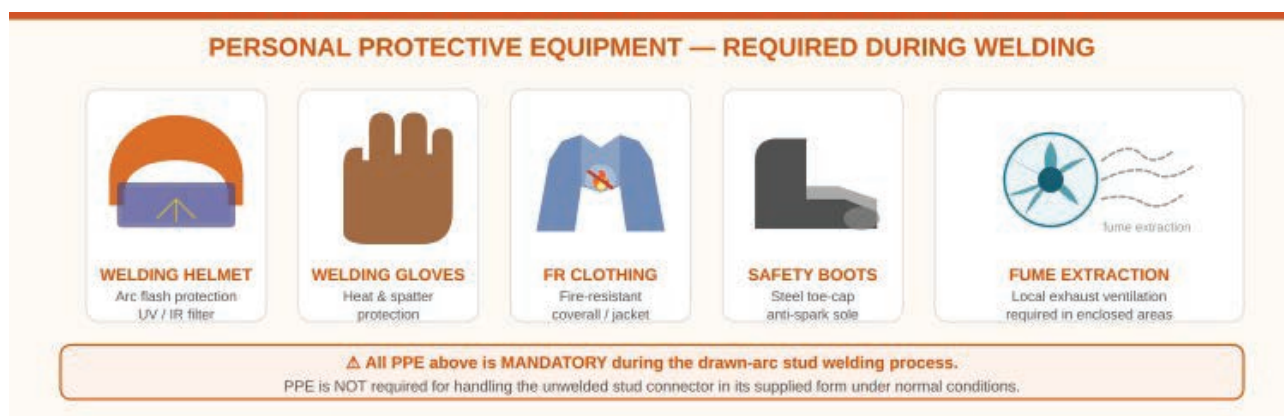
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Section 8 - Exposure Controls / Personal Protective Equipment

PPE is mandatory during the drawn-arc stud welding process. Not required for ordinary handling of the unwelded connector under normal conditions.

WELD COLLAR VISUAL INSPECTION CRITERIA



Mandatory PPE for stud welding - all five items required simultaneously

Section 9 - Physical & Chemical Properties

Exposure Route	First Aid Action
Appearance	Solid metallic cylindrical stud with formed cheese head; light grey/silver, phosphate-plated finish
Odour	None
Melting point	~1450–1530°C (carbon steel)
Solubility in water	Insoluble
Flammability	Non-flammable (solid metal article)
Relative density	~7.85 g/cm ³ (carbon steel)
Vapour pressure	Not applicable (solid article)
Reactivity	Stable under normal conditions



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Section 10 - Stability & Reactivity

Chemically stable under normal storage and handling conditions. No hazardous polymerisation, decomposition, or self-heating reactions expected.

- Conditions to avoid: prolonged exposure to moisture or salt spray (may cause surface corrosion of carbon steel).
- Materials to avoid: strong acids and strong oxidising agents.
- Hazardous decomposition products: during welding only - iron oxide and manganese oxide fumes (process-generated, not spontaneous).

Section 11 - Toxicological Information

The solid steel article presents no toxicological hazard under normal handling. Hazards are associated only with the welding process:

- Metal fume (iron oxide, manganese oxide): respiratory irritation with repeated, unprotected exposure. Manage manganese fume below applicable OEL/TLV.
- UV/IR arc radiation: risk of arc-eye (photokeratitis) without adequate eye protection.
- Stainless steel grades: welding may generate hexavalent chromium fume - additional ventilation and respiratory protection required.
- No known carcinogenic classification for the supplied solid product in its unwelded form.

Section 12 - Disposal Considerations

- Reject studs and steel offcuts: fully recyclable as scrap metal - segregate and deliver to a licensed metal recycler.
- Used ceramic ferrules: inert mineral waste - dispose of as construction debris per local regulations.
- Packaging: recycle as cardboard / mixed packaging waste.
- Flux powder residue: treat as inert solid waste; do NOT dispose of into drains or watercourses.

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Section 13 - Regulatory Information & Disclaimer

This MSDS is issued for general guidance on the safe handling, storage, and welding of Smart Skill shear stud connectors, based on recognised international standards and practice for steel welding consumables.

- Does NOT replace the project's site-specific HSE plan, hot-work permit system, or applicable national OSH regulations, which shall take precedence.
- For Saudi Arabia projects: comply with applicable MOMRA, MOHRSD and Saudi Standards Organisation (SASO) requirements.
- Product manufactured in accordance with ISO 13918; compatible with ASTM A1044/A1044M requirements.



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