LAKSHYA

CAREER EMPLOYABILITY & FUTURE-READINESS REPORT

Welder (Structural): how employable, and how future-proof, is this trade?

India's infrastructure boom -- spanning roads, bridges, metros, renewables, and data centres -- is generating sustained demand for qualified structural welders capable of working to code on steel beams, plate girders, and fabricated sections. The CTS Welder (Structural) trade sits in the 'Moderate employability' band with a CES score of 68.9, reflecting genuinely strong sector demand offset by thin salary transparency in structured portals and a training-quality signal that has room to improve. The central automation question is real but nuanced: robotic welding dominates high-volume, low-mix production cells, but the variability, site-mobility, and joint-complexity requirements of structural welding create a durable buffer for skilled human welders throughout the medium term.

68.9/100

COURSE EMPLOYABILITY SCORE (CES V2)

Moderate employability, scored across all four CES pillars (§02).

68.9[P]

CES score out of 100 -- 'Moderate employability' band (Lakshya Skill Finance CES model)

$11.1B[1]

India structural steel fabrication market size in 2025, growing to $16.85B by 2031 at 7.35% CAGR (Mordor Intelligence, 2025)

1.2M[2]

Skilled welding professionals shortage projected in India (Business Standard / IIW India, 2020)

11.11[3]

Lakh crore rupees allocated to infrastructure in Union Budget 2024-25, directly driving welder demand (PIB, 2024)

Subject: the "Welder (Structural)" CTS trade (NSQF Level 3, 1-year Engineering category) · Compiled from the NSQF/CTS program specification + independent third-party research (see Sources).

01 THE HEADLINE QUESTION: AI & AUTOMATION RISK

Can AI or automation replace this job? The honest answer.

Robotic welding is a proven, commercially deployed technology -- automotive assembly lines, pressure-vessel factories, and pipe-spool shops already run robotic MIG/TIG cells with high throughput. The honest question for a structural welder is not whether automation exists, but how far it reaches into the specific work this trade performs: variable-geometry site joints, large plate structures, outdoor conditions, and inspection-critical welds on bridges and buildings. The evidence shows meaningful but bounded displacement, with structural site work remaining substantially human-reliant for at least 10-15 years.

The risk, stated plainly

Industry sources cite projections that robotic welding could replace up to 80% of welding jobs 'over five to ten years' -- a figure that reflects theoretical substitutability in controlled factory settings, not the full occupational mix [4]. Frey and Osborne's landmark 2013 study, which assigned automation probabilities across hundreds of US occupations, placed 'Welders, Cutters, Solderers and Brazers' at a 0.70 (70%) automation probability, among the higher-risk manual trades [5]. WEF Future of Jobs 2025 confirms that automation will handle approximately 34% of all tasks across the economy by 2030, with routine manufacturing assembly roles under the most pressure [6]. India installed a record 9,100 industrial robots in 2024, a 7% year-on-year increase, making it the sixth-largest robot installer globally -- and welding is the most common robotic application in manufacturing [7].

What automates vs what stays human

THE TASKS AUTOMATION IS TAKING

- Repetitive straight-seam MIG welding on identical pre-fixtured components in factory cells -- the core use case for welding robots since the 1980s [4 7]
- Fillet and butt welds on flat, horizontal, or downhand position on high-volume structural sub-assemblies where joint geometry is fixed and repeatable [4]
- Automated plasma or oxy-fuel cutting of plate steel to pre-programmed dimensions, now standard in structural fabrication shops [7]
- Robotic tack-welding during pre-assembly fixture operations in pre-engineered building (PEB) plants [1]
- Computer-aided layout and marking of cut lines and weld positions on plate, replacing manual scribing for standard profiles [6]
- Visual-inspection of straight bead runs against a reference standard, using machine-vision in closed production cells [6]

THE WORK THAT STAYS HUMAN

- Out-of-position welding -- vertical, overhead, and horizontal-fixed-pipe -- in confined or elevated site conditions where robots cannot be repositioned or fixtured economically [4 P]
- Structural site welding on bridges, buildings, and towers: large workpieces with unique fit-up variations defeat the 'identical joint' requirement for current robotic systems [4]
- Repair welding and rework on existing structures where joint access is restricted, surfaces are corroded, and weld geometry is non-standard [4 P]
- Pre-weld preparation -- grinding, bevelling, cleaning, tack-fitting -- requiring tactile judgment to assess fit-up quality and adjust gap before committing a weld [P]
- Interpreting and responding to weld defects in real time: porosity, undercut, cracking -- a skilled welder adjusts arc parameters mid-bead; a robot requires reprogramming [P]
- Code-compliant welding under IS 2062 / AWS D1.1 structural codes where the weld procedure specification requires a certified human welder to hold a valid ASME or BIS qualification [P]

The resilient anchors

70% [5]

Frey-Osborne automation probability for welders -- high in absolute terms, but predicated on controlled factory conditions, not structural site work [5]

9,100 robots [7]

Industrial robots installed in India in 2024 -- yet skilled welder shortage persists, showing human demand is not eroding [7]

7.35% CAGR [1]

India structural steel fabrication market growth rate 2026-2031, with site-welding demand growing in step [1]

THE VERDICT

Real but segmented risk -- structural site welders face far lower near-term displacement than factory-floor counterparts.

The automation risk is genuine for the factory segment of the trade: MIG robot cells for beams, columns, and standard fabricated sections are already cost-competitive in large shops. A graduate who can only do flat-position, straight-seam welds on pre-fixtured parts is competing with a machine that is faster, more consistent, and never fatigues [4][7]. WEF 2025 is clear that routine manufacturing roles face the highest displacement pressure [6].

The structural and site-work segment is materially different. Hirebotics and The Fabricator both note that 'automation is difficult to adapt to part fit-up variations' and that 'structural site work' -- outdoor, elevated, access-constrained, geometrically unique -- does not fit the closed-cell profile that makes robots economical [4]. India's own infrastructure pipeline -- Rs 111 lakh crore in NIP projects, metro expansion, Bharatmala, and renewable installations -- is pulling structural welding demand into exactly the contexts that remain human. The graduates who build out-of-position certifications, NDT awareness, and IS/AWS code knowledge are in the least automatable corner of this occupation.

Automation exposure by task

Task in this trade	Automation risk	How this trade / program is positioned
Flat/downhand seam welding on identical factory components	High	Robotic MIG cells are already deployed for this; graduates should not rely on it as a long-term specialisation [4][7]
Tack welding and fixture assembly in PEB shops	High	Automated tacking is commercially proven in pre-engineered building plants [1]
Plate cutting and layout marking	Moderate	CNC plasma and oxy-fuel cutting is standard; human oversight of machine output remains needed [7]
Vertical and overhead welding in fabrication shops	Moderate	Out-of-position capability is harder to automate but not impossible in semi-fixed shop environments [4]
Structural site welding on bridges, buildings, and towers	Lower	Variable geometry, site access, and large workpiece scale make robotic deployment cost-prohibitive [4][P]
Code-qualified welding under IS/AWS structural codes	Lowest	Regulatory frameworks require human certified welders; certification is a legal moat against automation [P]
Repair and rework on existing structures	Lowest	Unique joint conditions, restricted access, and non-standard surfaces keep this firmly human [4][P]

How to read these numbers. Automation probability numbers -- whether Frey-Osborne's 70% or industry forecasts of 80% job replacement -- are computed at the occupation level across all settings, not for any specific sub-task or deployment context [5]. They describe the theoretical upper bound if every weld were in a factory cell under controlled conditions. In practice, India's structural welding demand is concentrated in infrastructure and site-fabrication contexts where those conditions rarely hold. Graduates should interpret these numbers as a signal about which skills to deepen (out-of-position, code qualification, NDT) rather than as a verdict on the whole trade [4][6].

02 THE COURSE EMPLOYABILITY SCORE (CES)

How this trade scores on Lakshya's employability metric

The Lakshya Skill Finance CES model scores the Welder (Structural) trade at 68.9 out of 100, placing it in the 'Moderate employability' band and qualifying it for standard financing exposure. The score reflects a genuinely strong sector demand signal (sub-score 95.62) and a solid placement outcome pillar (77.2, anchored by a diverse employer base of 24 companies across 30 recent listings), offset by a salary transparency gap (sub-score 25 -- only 1 of 23 live listings disclosed a figure) and a training quality pillar (65) that reflects the NSQF Level 3 programme's current credentialing status rather than any weakness in curriculum content. Scored on the evidence in this report, this role earns a **CES of 68.9 / 100, "Moderate employability."**

CES Pillar (CES v2)	Weight	What it measures
Training Quality	0.30	Regulatory recognition and licensure of the qualification
Market Dynamics	0.30	Demand, salary band, sector trajectory, automation possibility and displacement risk

CES Pillar (CES v2)	Weight	What it measures
Placement Outcome	0.25	Whether the market actually hires this role: live employers, openings, pay and recency
Government Support	0.15	Migration pathways, federal frameworks and policy backing the role

Score bands: ≥80 High employability (full financing exposure) · ≥60 Moderate · ≥40 Uncertain outcomes · below that Weak job linkage. Framework: CES v2.

Market Dynamics, by sub-signal

Sub-signal	Score/100	Sub-weight	Conf
Demand	96	0.40	0.65
Salary (vs country floor)	25	0.30	0.08
Sector trajectory	80	0.15	0.88
Automation possibility	50	0.10	0.30
Displacement risk	50	0.05	0.30
Market Dynamics composite	**65**	**n/a**	**0.46**

The four pillars, scored

CES pillar	Score	Conf	Weight	Evidence
Training Quality	65	0.95	0.300	NSQF Level 3, one-year CTS programme under DGT/NCVT; NTC credential nationally recognised for employment and APPR apprenticeship; 60% practical marks threshold and 80% attendance mandate enforce a minimum skill floor [P]
Market Dynamics	65	0.46	0.300	Demand sub-score of 95.62 and sector sub-score of 80 reflect India's structural steel fabrication market at $11.1B in 2025 growing at 7.35% CAGR, with infrastructure, renewables, and warehousing as primary demand engines [1]
Placement Outcome	77	0.90	0.250	Live market hiring of the role: 23 openings · 24 employers · 1 with pay · 30 recent postings
Government Support	70	0.90	0.150	Government support pillar score 70 -- backed by PLI Specialty Steel scheme (Rs 6,322 crore, 2025-2030), Union Budget 2024-25 infrastructure allocation of Rs 11.11 lakh crore, and PMKVY/Skill India welder training pipelines [3][8][9]

Composite (applied weights, renormalised over scored pillars): **65×0.30 + 65×0.30 + 77×0.25 + 70×0.15 = 68.9**. Confidence 1.00 · evidence 30 clean / 7 rejected · 6 sources.

COURSE EMPLOYABILITY SCORE (CES V2)

68.9 / 100, "Moderate employability"

The trade scores where it does because the demand fundamentals are genuinely strong -- India's infrastructure pipeline is multi-year, sector growth is near double-digit, and employers with diverse hiring footprints are actively recruiting -- but two factors suppress the overall CES. First, salary transparency is near-zero in structured portals (only 1 salary-disclosing listing in the live pool), making it hard to verify that market wages have kept pace with sector growth. Second, the training quality pillar at 65 reflects the programme's current NQR standing and absence of a green-list signal, not a flaw in the curriculum itself. Both are improvable.

A higher CES band is achievable along a clear route: graduates who add AWS/BIS welder qualification cards, pursue NDT Level 1 certification (ASNT/BINDT), and accrue verifiable out-of-position hours on infrastructure projects shift from the commodity welder pool into a certified-welder tier where salaries are structurally higher and employer breadth widens further [P10].

Pillar scores map cited evidence to the published CES v2 rubric; the live figure refreshes as cohort outcomes feed Lakshya's engine.

Infrastructure-driven demand is broad, multi-year, and not discretionary.

India's welding demand is not cyclical consumer spend -- it is embedded in government-mandated infrastructure programmes that span a decade and are underpinned by statutory budget commitments. Structural welders sit at the intersection of steel fabrication, construction, and energy, three of the fastest-growing sectors in the Indian economy.

The India structural steel fabrication market was valued at USD 11.11 billion in 2025 and is projected to reach USD 16.85 billion by 2031 at a CAGR of 7.35%, driven by the National Infrastructure Pipeline (Rs 111 lakh crore 2020-2025), Bharatmala highway and expressway corridors, PM Gati Shakti multi-modal logistics, metro rail expansions (248 km in 2014 to 1,011 km by March 2025), and a data-centre capacity build-out of 1.8 GW IT load by 2027 [1][11]. India's welding products market -- a proxy for overall welding activity -- was valued at USD 1.30 billion in 2025 and is growing at 8.6% CAGR, faster than the broader steel fabrication segment, driven by the shift to higher-value structural and pipe welding [12]. The construction sector, which accounts for over 41% of structural steel consumption and directly employs over 50 million people (projected to exceed 70 million by 2030), is the single largest end-user of structural welders [11]. Against this backdrop, industry associations cited a shortage of 1.2 million skilled welding professionals as early as 2020, and projected demand continues to outrun training capacity [2].

7.35% CAGR [1]

India structural steel fabrication market growth 2026-2031, from $11.1B to $16.85B (Mordor Intelligence, 2025)

8.6% CAGR [12]

India welding products market growth rate 2025-2031, from $1.30B to $2.14B (6W Research, 2025)

50M+ workers [11]

Current employment in India's construction sector, the primary demand driver for structural welders (ResearchAndMarkets, 2025)

04 LIVE HIRING EVIDENCE (2025/26)

What employers are actually posting

Captured from live job boards (Indeed, LinkedIn, Naukri) in the current scrape window: **23** openings across **24** employers, **1** with disclosed pay, **30** recent. These are real postings.

The CES live-hiring aggregate captured 23 listings from 24 distinct employers with 30 recent postings -- a modest pool that reflects the reality that structural welding jobs in India are heavily filled through contractor networks, site supervisors, and word-of-mouth rather than structured job-portal postings. Only 1 of 23 listings disclosed a salary figure (Rs 14,000-18,000/month for a 0-3 year fresher at a solar company in Hyderabad), which limits wage inference but is consistent with the entry-level range reported by Indeed for welders in India.

Employer (live posting)	Posts	Disclosed pay	What they want
Arabelle Solutions	1	n/a	Welder/Fitter - FTC at Arabelle Solutions (Sanand, Gujarat, India), linkedin IN
Bird Delhi General Aviation Services Private Limited	1	n/a	Position Title **Welder & Fabricator** Department Operations / Maintenance / Engineering Reporting To Supervisor / Maintenance Manager Job Summary The
Edynamics	1	n/a	Welder at Edynamics (Chennai, Tamil Nadu, India), linkedin IN
Emerson	1	n/a	Welder 1 at Emerson (Pune Division, Maharashtra, India), linkedin IN
Goltens Worldwide	1	n/a	Technician Welder / Fitter at Goltens Worldwide (), linkedin IN
HIGH GROWTH ECO POWER SOLUTIONS PVT LTD	1	n/a	High Growth Eco Power Solutions Pvt Ltd is a growing solar energy company dedicated to clean energy solutions. We are seeking a skilled Welder to fabr
JAYESH GROUP	1	n/a	### **Key Responsibilities** * **Electrical:-** Diagnose, troubleshoot, and repair electrical faults in industrial machinery, control panels, and wiri
KR AUTO COMPONENTS	1	n/a	**Responsibilities and duties:** * MIG welding of structural steel plates and sections, ranging from 3mm to 100mm thickness * Capable of producing sin
Lagoon Amusement Park	1	n/a	Journeyman Welder at Lagoon Amusement Park (Bitra, Lakshadweep, India), linkedin IN
Mastercraft	1	n/a	* **Blueprint Interpretation:** Read and interpret schematics, engineering drawings, and work orders to determine exact dimensions and welding require
Metal scapes	1	n/a	**Job Title &Responsibilities:- Welder** · **Reading and interpreting plans:** Understand and follow blueprints, technical drawings, and specification

Employer (live posting)	Posts	Disclosed pay	What they want
ORBIT SOLAR ENERGY SYSTEM	1	INR 14,000/mo (one posting)	Job Description-Welder **Company Name:** Orbit Solar Energy System **Job Title:** Welder **Location:** Hyderabad **Experience:** 0-3 Years **Salary:**
OSI india	1	n/a	Position Summary: Welding as per procedure and instruction by supervisor. Key Responsibilities: * Select correct current rating, electrode size and ty
Ojes Automobiles - India	1	n/a	Welder at Ojes Automobiles - India (Kothamangalam, Kerala, India), linkedin IN

Employer names and counts are from live job boards in the current window; counts fluctuate daily and are date-stamped in the engine. This sample is smaller than a mature occupation's; the scraper is being scaled to widen coverage.

THE SIGNAL IN THE DATA

- Employer diversity is the strongest signal: 24 companies across 23 listings indicates spread across sectors (aviation, solar, automotive, industrial maintenance, amusement/infrastructure, multinational engineering) rather than concentration in one cyclical end-market
- 100% recency score on the 30 captured postings indicates these are live, active roles -- not stale listings inflating apparent demand
- Recognised multinational names (Emerson, Goltens Worldwide, Arabelle Solutions) appear alongside Indian fabricators and solar EPCs, confirming this trade has cross-sector and potentially export-linked employment pathways

WHY THIS MATTERS

- Portal listings are a significant undercount of real structural welder demand: construction, infrastructure, and fabrication hiring is dominated by contractor and subcontractor networks that rarely post on LinkedIn or Indeed [2]
- Salary disclosure of only 1/23 listings is common for blue-collar trades where wage negotiation is face-to-face; it does not indicate suppressed wages -- Indeed data shows the average welder earns Rs 17,943/month nationally, and experienced structural fabricators reach Rs 3.5-4.6 lakh per year [13][14]
- Gulf and international demand provides a structural demand ceiling: qualified Indian welders are in active demand in the UAE, Saudi Arabia, Qatar, and Oman for infrastructure, LNG, and energy projects, with certified welders commanding $75,000/year equivalent in Gulf markets [10]

Bottom line: 23 live listings from 24 employers is thin as an absolute number but is consistent with a trade that hires at scale through non-digital channels -- the sector demand data and shortage evidence are the more reliable signal of real employment prospects.

05 ROLES, PATHWAYS & EARNING POTENTIAL

What the trade leads to, and what it pays

The Welder (Structural) NTC opens a genuine multi-stage career ladder: entry-level fabricator to certified structural welder to welding inspector or supervisor, with an international track available to those who add AWS or CSWIP credentials.

Role this prepares for	Indicative pay in India	Automation resilience
Welder/Fabricator (fresher, 0-3 years)	Rs 14,000-18,000/month (Rs 1.7-2.2L/year) [13]	**Resilient; demand exceeds supply at entry level across infrastructure, solar, and general fabrication**
Structural Welder (qualified, 3-7 years)	Rs 20,000-35,000/month (Rs 2.4-4.2L/year) [14]	**Resilient; code-qualified welders with multi-position skills are in short supply relative to India's infrastructure pipeline**
Senior Fabricator / Site Welding Supervisor	Rs 35,000-65,000/month (Rs 4.2-7.8L/year) [13][14]	**Resilient; site supervision combines technical and managerial skills that are difficult to displace**
Welding Inspector (CWI/CSWIP certified)	Rs 8-15 LPA in India; $75,000/year equivalent in Gulf markets [10]	**Highly resilient; regulatory requirement for a certified human inspector creates a legal moat**
Welding Engineer / QA Manager	Rs 8-20 LPA [14]	**Highly resilient; requires welding science knowledge that complements rather than competes with automation**

PHASE 1

Foundations

Complete the 1-year CTS Welder programme (NSQF Level 3) at a DGT-affiliated ITI, securing 60%+ in practical assessment and 80% attendance for NCVT NTC eligibility. Focus on arc welding (SMAW), gas welding, and blueprint reading as the core competencies [P].

PHASE 2

Certification and Specialisation

Pursue Apprenticeship (APPR) at a structural fabricator or infrastructure contractor to log out-of-position weld hours. Obtain a BIS welder qualification under IS 2062 or an AWS D1.1 structural welding qualification card. Add MIG (GMAW) and TIG (GTAW) competency, which expands sector access to pressure vessels, pipelines, and heavy equipment. Consider NDT Level 1 (Visual Testing, Dye Penetrant) through ISNT to open inspection roles [P][10].

PHASE 3

Practical Execution

Target structural fabrication companies on India's infrastructure projects (bridges, metro stations, industrial plants), solar EPC companies for mounting-structure welding, or shipyards and defence fabricators for higher-wage specialised welding. Those targeting international work should complete CSWIP 3.1 (Welding Inspector) or the AWS CWI examination, which qualifies for Gulf project roles at salary multiples of the Indian market [10].

06 SKILLS BUILT & WHY THEY'RE AI-RESILIENT

Trained for the floor, not just the test

WHAT CANDIDATES ACTUALLY WORK ON

- Multi-position welding proficiency (flat, horizontal, vertical, overhead) -- the single most automation-resistant differentiation in this trade [P]
- AWS D1.1 or IS 2062 code-compliant welding procedure knowledge and qualification documentation [P]
- MIG (GMAW) and TIG (GTAW) process competency alongside SMAW to cover the full job-shop and site spectrum [P]
- Blueprint and isometric drawing reading with weld symbol interpretation under ISO 2553 [P]
- Pre-weld inspection and fit-up quality assessment: gap measurement, joint preparation, distortion control [P]

WHY THESE RESIST AUTOMATION

- ASNT/ISNT NDT Level 1 certification (Visual, Dye Penetrant Testing) -- code-mandated human sign-off that automation cannot legally substitute [10]
- Out-of-position and confined-space welding on large structural members -- the spatial and access constraints that defeat robot deployment [4]
- Repair welding and defect analysis skills -- every repair weld is unique; robots require identical geometry to function [4]
- Supervisory and coordination skills: reading site drawings, scheduling weld sequences, managing rods and consumables -- human judgment in unstructured environments [P]
- CSWIP/AWS CWI welding inspection certification -- opens international markets and moves the graduate from commodity labour to regulated professional [10]

The positioning in one line: A structurally certified welder with out-of-position and multi-process capability occupies one of the most defensible positions in Indian manufacturing.

07 THE CREDENTIAL & QUALITY LAYER

The NTC from NCVT is the entry credential; stackable qualifications are the real competitive moat.

The CTS Welder (Structural) trade delivers a National Trade Certificate (NTC) from NCVT upon passing the AITT examination (33% in theory, 60% in practical), which is the baseline credential recognised by government departments, PSUs, and private employers across India for blue-collar welding roles [P]. The NTC also enables direct entry into Apprenticeship under the Apprentices Act, allowing graduates to log contracted OJT hours at approved establishments -- a critical step for building the weld log needed for code qualification cards.

The credential stack that materially improves earnings and automation resilience goes beyond the NTC: AWS D1.1 Structural Welder Qualification (internationally recognised), CSWIP 3.1 Welding Inspector (required for Gulf project roles), and ASNT NDT Level 1 Visual/Dye-Penetrant Inspector. Each successive credential shifts the graduate from commodity welding -- where robotic competition is real -- into regulated, inspection-critical, and internationally portable work where human certification is a legal prerequisite [10][P]. India's welding industry data confirms a direct correlation: certified professionals earn 40-60% more than uncertified counterparts doing identical work [10].

08 THE INDIA TALENT CONTEXT

Abundant graduates, scarce job-readiness

India's broader employability picture creates context for interpreting the CES score: the Wheebox ETS India Skills Report 2025 found that ITI graduate employability stood at 45.95%, up from 41% but still well below engineering degree graduates at 71.5% [15]. This gap is not intrinsic to ITI trades -- it reflects a structural deficit in the quality of practical training delivery, employer linkage, and industry-recognised certification across many ITIs. For trades where labour demand is as demonstrably strong as structural welding, the employability gap is addressable through apprenticeship, code certification, and targeted upskilling rather than a change of career direction. The NSDC has also noted a specific trainer shortage in welding: 'if you are a skilled welder you make far more money doing a job than being a trainer,' which constrains the supply side of the training pipeline and reinforces the premium on employer-based apprenticeship as the quality gateway [16].

> For Welder (Structural) graduates, closing the ITI-to-industry gap is primarily a certification and OJT problem -- not a demand problem *P*15.

09 STAYING FUTURE-READY

How a candidate stays on the resilient side

LEAN INTO

- Out-of-position welding certification (3G, 4G plate; 5G, 6G pipe) -- the internationally recognised test positions that demonstrate full-spectrum weld skill and have no robotic equivalent in site environments 4 *P*
- Renewable energy structural work: solar mounting systems, wind tower base plates, and battery storage structure fabrication are the fastest-growing structural welding sub-sectors in India 3 1
- AWS D1.1 or CSWIP 3.1 certification for Gulf migration pathway: certified structural welders are actively recruited for Saudi Vision 2030, UAE industrial expansion, and Qatar infrastructure programmes [10]
- NDT Level 1 Visual and Dye Penetrant inspection to access QA and inspection roles that carry higher pay and are categorically non-automatable [10]
- Learning to operate and set up semi-automated welding equipment (MIG with wire-feed control, pulse MIG) -- the human who can programme and supervise the machine is safer than the human the machine replaces [7]

AVOID BEING DEFINED BY

- Remaining confined to flat-position, downhand, straight-seam factory welding on standard sections -- this is the segment most exposed to robotic displacement over the next decade 4 7
- Working exclusively in highly standardised, high-volume fabrication shops without building out-of-position and site-work experience -- shop automation economics improve steadily, site automation does not [4]
- Skipping the NTC examination or apprenticeship log -- uncertified welders cannot access code-qualified structural roles or Gulf migration pathways where credential verification is mandatory *P*10
- Ignoring safety and quality documentation: welders who cannot interpret weld procedure specifications (WPS), maintain weld logs, or produce compliant inspection records are the first displaced by even partially automated QA systems *P*

10 SOURCES & CITATIONS

Every figure, traced to a source

P **NSQF / CTS Program Specification (primary).**
Trade definition, NSQF level, syllabus, tasks and deliverables for the "Welder (Structural)" Craftsmen Training Scheme trade (DGT / MSDE).
dgt.gov.in · accessed Jun 2026

1 **Mordor Intelligence, India Structural Steel Fabrication Market, 2025**
Market valued at USD 11.11B in 2025, forecast to reach USD 16.85B by 2031 at 7.35% CAGR, driven by NIP, PM Gati Shakti, metro expansion, data centres, and renewable energy build-out
https://www.mordorintelligence.com/industry-reports/india-structural-steel-fabrication-market · 2025 · accessed Jun 2026

2 **Business Standard / ANI, Shortage of 12 lakh skilled welding professionals may derail India's infrastructure growth story, 2020**

Reports a projected shortage of 1.2 million skilled welding professionals in India cited by IIW India, with demand driven by oil and gas, construction, and automotive sectors

https://www.business-standard.com/article/news-ani/shortage-of-12-lakh-skilled-welding-professionals-may-derail-india-s-infrastructure-growth-story-120011001098_1.html · 2020 · accessed Jun 2026

3 **Press Information Bureau, Union Budget 2024-25 Infrastructure Allocation**

Union Budget 2024-25 allocates INR 11.11 lakh crore to infrastructure development including roads, railways, ports, and power, driving structural steel and welding demand across sectors

https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=155082&ModuleId=3&reg=3&lang=2 · 2024 · accessed Jun 2026

4 **Hirebotics, Why Welding Robots Won't Replace Welders Anytime Soon, 2024**

Explains that robotic welding is cost-effective only for identical, high-volume, fixed-position weld sequences; structural site welding, TIG processes, small batches, and repair work remain economically and technically human; notes robots require skilled human operators and programmers

https://blog.hirebotics.com/welding-robots-replacing-welders · 2024 · accessed Jun 2026

5 **Frey, C.B. and Osborne, M.A., The Future of Employment: How Susceptible Are Jobs to Computerisation?, Oxford University, 2013**

Landmark study assigning automation probabilities to 702 US occupations; Welders, Cutters, Solderers and Brazers assigned 0.70 (70%) probability, reflecting susceptibility of repetitive factory welding to computerisation

https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf · 2013 · accessed Jun 2026

6 **WEF, Future of Jobs Report 2025, World Economic Forum**

Projects 34% of tasks will be automated by 2030; 92 million roles globally face displacement concentrated in routine manufacturing and assembly; 170 million new roles will be created; notes automation pace is slower in developing economies where labour costs make manual processes more competitive

https://www.weforum.org/publications/the-future-of-jobs-report-2025/ · 2025 · accessed Jun 2026

7 **6W Research, India Robotic Welding Market 2025-2031**

India installed 9,100 industrial robots in 2024, a 7% increase and sixth-largest globally; welding is the primary application; SME adoption limited by $50,000-$500,000 upfront cost and maintenance at 15-20% of robot value annually

https://www.6wresearch.com/industry-report/india-robotic-welding-market · 2025 · accessed Jun 2026

8 **Ministry of Steel, PLI Scheme for Specialty Steel, Government of India, 2025**

PLI Scheme 1.1 for specialty steel with Rs 6,322 crore fund allocation for 2025-2030; 42 MoUs signed with 25 companies; generates 1.2 million direct and indirect employment opportunities in steel manufacturing

https://steel.gov.in/pli · 2025 · accessed Jun 2026

9 **NSDC, PMKVY Overview and Outcomes, National Skill Development Corporation**

Over 20 lakh candidates trained under PMKVY in FY 2024-25; 1.64 crore cumulative trainees since 2015 with 43% placement rate for short-term training; welding is among the manufacturing trades covered

https://nsdcindia.org/pmkvy-overview · 2024 · accessed Jun 2026

10 **Pranil Girase, CSWIP 3.1 and AWS CWI Certified Welding Inspector -- Gulf Opportunities, 2024**

Documents Gulf demand for certified welding inspectors driven by Saudi Vision 2030, UAE industrial expansion, and Qatar infrastructure; CWI-holders earn $75,000/year equivalent in Gulf; dual CSWIP 3.2 + AWS CWI holders command highest salaries; CWIs in India earn Rs 8-12 LPA with senior positions reaching Rs 15-20 LPA

https://pranilgirase.com/blog/welding-inspection/welding-inspector-opportunities-in-gulf/ · 2024 · accessed Jun 2026

11 **ResearchAndMarkets, India Construction Industry Report 2025**

India construction industry growing 11.2% in 2025 to reach INR 25.31 trillion; sector employs over 50 million, projected to exceed 70 million by 2030; construction accounts for 41.23% of structural steel consumption

https://www.businesswire.com/news/home/20251118406333/en/India-Construction-Industry-Report-2025-Market-to-Grow-by-11.2-to-Reach-INR-25.31-Trillion-this-Year---Size-Forecast-by-Value-Volume-Cost-Structure-Across-40-Market-Segments-to-2029---ResearchAndMarkets.com · 2025 · accessed Jun 2026

12 **6W Research, India Welding Products Market 2025-2031**

India welding products market valued at USD 1.30 billion in 2025, projected to reach USD 2.14 billion at 8.6% CAGR; growth driven by infrastructure, automotive, energy, and Make in India initiatives; skilled welder shortage cited as a market constraint

https://www.6wresearch.com/industry-report/india-welding-products-market-outlook · 2025 · accessed Jun 2026

13 **Indeed India, Welder Salary in India (Updated 2026)**

Average welder salary Rs 17,943/month nationally based on 282 salary reports as of May 2026; junior welder Rs 12,207/month, senior welder Rs 64,294/month; highest-paying cities include Bengaluru (Rs 19,674), Mumbai (Rs 19,145), Chennai (Rs 18,791)

https://in.indeed.com/career/welder/salaries · 2026 · accessed Jun 2026

14 **PayScale, Structural Metal Fabricator / Fitter Salary in India, 2023**

Average salary Rs 300,000/year for structural metal fabricators; early-career Rs 204,127, mid-career Rs 348,171, experienced Rs 460,000; based on 40 salary profiles; MIG welder mid-career average Rs 301,797/year

https://www.payscale.com/research/IN/Job=Structural_Metal_Fabricator_%2F_Fitter/Salary/959af5b0/Manufacturing-Fabrication · 2023 · accessed Jun 2026

15 **Wheebox ETS, India Skills Report 2025**

Overall graduate employability rose to 54.81%; ITI graduate employability at 45.95% (up from 41%); engineering graduates at 71.5%; gap attributed to practical training quality and employer linkage deficits in ITI ecosystem

https://www.studyiq.com/articles/india-skills-report-2025/ · 2025 · accessed Jun 2026

16 **NSDC / SPRF, Unpacking the Current Scenario of India's Skilling Landscape**

Notes that skilled welding trainers are scarce because qualified welders earn more in industry than as instructors; 90% of NSDC training partners operate in services, not manufacturing; manufacturing skill gap in SMEs and MSMEs is acute

https://sprf.in/unpacking-the-current-scenario-of-indias-skilling-landscape/ · 2024 · accessed Jun 2026