

Machine Operator

FF13 Engineering, maintenance and production · ISCO-08 8189 · CBS 0771 Machine operators · seniority junior · Also known as: Line Operator, Equipment Operator

Operates one or more production machines following fixed instructions, monitors the process and intervenes on minor deviations.

The machine operator runs a machine within fixed parameters, following documented procedures. Unlike a process operator, who oversees a whole process, this role focuses on one machine or production line. Selection often tests experience with a specific machine, while the ability to stay alert during monotonous repetitive work over a whole shift is rarely tested.

Key figures for this profile

24 skills · 7 competencies to measure · 5 knockout skills · centre of gravity: Execution, craft, safety and sustainability 33%, Professional knowledge domains 26%, Cognitive ability and problem solving 17%

1 Competencies to measure

These are the behavioural and ability constructs in this profile. Each one shows which hrmforce questionnaire measures it.

Competencies to measure	Target level	hrmforce instrument	Assessment method	Behavioural anchor at target level
Safety awareness Competency (50-framework): Discipline Knockout	 N3	Big Fifty, Competency Check	Situational Judgement Test	Recognises unsafe situations in own process, intervenes and addresses colleagues without bringing the work to a halt.

Competencies to measure	Target level	hrmforce instrument	Assessment method	Behavioural anchor at target level
Discipline and keeping commitments Competency (50-framework): Discipline	 N2	Big Fifty, 15PF, 360 Feedback	Personality questionnaire	Arrives at the agreed time with the agreed work and reports any delay to the supervisor.
Spatial ability	 N2	Ability Scan	Cognitive ability test	Points out the right route on a floor plan and names which side lies left or right of the entrance.
Accuracy and attention to detail Competency (50-framework): Accuracy	 N2	Big Fifty, 360 Feedback	Personality questionnaire	Goes through the own work with a checklist and repairs errors found before the work is passed on.
Demonstrating ownership Competency (50-framework): Results-Orientation	 N2	Big Fifty, 360 Feedback, Competency Check	360-degree feedback	Reports an own mistake to the supervisor and asks which repair step should be taken first.
Sustaining pace in repetitive work Competency (50-framework): Discipline	 N2	Big Fifty, Work sample test	Work sample test	Completes the assigned series of operations at the pace indicated and reports when a backlog arises.
Managing workload pressure Competency (50-framework): Stress resilience	 N2	Big Fifty, Competency Check, Pulse Survey	Structured interview	Tells the supervisor that the work does not fit the available time and follows the choice that is made.

2 Full skill profile

Every skill in this profile, sorted by weight. The behavioural anchor under each skill belongs to the target level.

T	Skill	Target level	Weight	Knockout	Assessment method	hrmforce instrument
V	Operating machines Operates several machines independently, adjusts operating values to product condition and keeps output within the standard.	 N4	5	yes	Work sample test	Work sample test, Knowledge test (client-specific)
K	Technical understanding Independently explains the behaviour of an installation during a fault and traces the problem back to a technical principle.	 N3	5	yes	Knowledge test	Ability Scan, Knowledge test (client-specific)
G	Safety awareness Recognises unsafe situations in own process, intervenes and addresses colleagues without bringing the work to a halt.	 N3	5	yes	Situational Judgement Test	Big Fifty, Competency Check
V	Mechanical maintenance Carries out a maintenance round under supervision using a checklist and reports deviations to the maintenance technician.	 N2	5	yes	Work sample test	Work sample test, Knowledge test (client-specific)
V	Recognising and resolving machine faults Reports a fault together with its visible characteristics and shuts down the machine according to instruction.	 N2	5	yes	Work sample test	Work sample test, Knowledge test (client-specific)

T	Skill	Target level	Weight	Knockout	Assessment method	hrmforce instrument
V	Problem analysis States precisely what deviates in a malfunction and which data are missing, and puts this to the supervisor.	 N2	4	no	Assessment centre	Competency Check, Ability Scan
V	Quality control Checks a product or file on the prescribed points according to instruction and records deviations.	 N2	4	no	Work sample test	Competency Check, Work sample test
G	Discipline and keeping commitments Arrives at the agreed time with the agreed work and reports any delay to the supervisor.	 N2	4	no	Personality questionnaire	Big Fifty, 15PF, 360 Feedback
V	Electrical engineering work Installs electrical components under supervision according to the diagram and uses the prescribed protective equipment.	 N2	4	no	Certificate or diploma	Knowledge test (client-specific), Work sample test
V	Reading and applying technical drawings Points out on a drawing the dimensions, symbols and views that belong to the own work.	 N2	4	no	Knowledge test	Knowledge test (client-specific), Work sample test
V	Performing preventive maintenance Carries out a fixed maintenance point according to the checklist and then signs off the completion.	 N2	4	no	On-the-job observation	Work sample test, Knowledge test (client-specific)

T	Skill	Target level	Weight	Knockout	Assessment method	hrmforce instrument
A	Spatial ability Points out the right route on a floor plan and names which side lies left or right of the entrance.	 N2	3	no	Cognitive ability test	Ability Scan
G	Accuracy and attention to detail Goes through the own work with a checklist and repairs errors found before the work is passed on.	 N2	3	no	Personality questionnaire	Big Fifty, 360 Feedback
V	working in teams Carries out an own task within the team as agreed and reports to the team lead when something does not work.	 N2	3	no	360-degree feedback	Big Fifty, 360 Feedback, Competency Check
G	Demonstrating ownership Reports an own mistake to the supervisor and asks which repair step should be taken first.	 N2	3	no	360-degree feedback	Big Fifty, 360 Feedback, Competency Check
V	Working with digital devices and applications Opens and uses the prescribed applications for own tasks and asks for help whenever an unfamiliar message appears.	 N2	3	no	Work sample test	Knowledge test (client-specific), Work sample test
V	Measurement and calibration Measures with calliper and dial gauge under supervision and notes the result on the measurement form.	 N2	3	no	Work sample test	Work sample test, Knowledge test (client-specific)

T	Skill	Target level	Weight	Knockout	Assessment method	hrmforce instrument
G	Sustaining pace in repetitive work Completes the assigned series of operations at the pace indicated and reports when a backlog arises.	 N2	3	no	Work sample test	Big Fifty, Work sample test
V	Using personal protective equipment correctly Wears the prescribed protective equipment at the workplace and asks for replacement when damage is visible.	 N2	3	no	On-the-job observation	Knowledge test (client-specific), Work sample test
G	Managing workload pressure Tells the supervisor that the work does not fit the available time and follows the choice that is made.	 N2	2	no	Structured interview	Big Fifty, Competency Check, Pulse Survey
V	Professional currency and specialist literature Reads the professional information received and names which part matters for the own work.	 N2	2	no	Portfolio or evidence	Portfolio, Knowledge test (client-specific)
V	Guiding on the job Works alongside a new colleague, points out deviations in the operation and reports progress to the practice trainer.	 N1	2	no	On-the-job observation	360 Feedback, Competency Check
V	Applying workplace organisation and 5S Tidies tools and material to the designated place after the shift and keeps the workplace clean.	 N1	2	no	On-the-job observation	Work sample test

T	Skill	Target level	Weight	Knockout	Assessment method	hrmforce instrument
V	Business reporting Fills in an existing report template with the correct figures and describes per section what has been done.	 N1	1	no	Work sample test	Work sample test, Competency Check

3 Levels per seniority

The same profile with the job family seniority adjustment applied. Target levels are clamped to 1 to 5.

Skill	junior	medior
Operating machines	N4	N4
Technical understanding	N3	N4
Safety awareness	N3	N4
Mechanical maintenance	N2	N3
Recognising and resolving machine faults	N2	N3
Problem analysis	N2	N3
Quality control	N2	N3
Discipline and keeping commitments	N2	N3
Electrical engineering work	N2	N3
Reading and applying technical drawings	N2	N3
Performing preventive maintenance	N2	N3
Spatial ability	N2	N3
Accuracy and attention to detail	N2	N3
working in teams	N2	N3
Demonstrating ownership	N2	N3
Working with digital devices and applications	N2	N3
Measurement and calibration	N2	N3
Sustaining pace in repetitive work	N2	N3
Using personal protective equipment correctly	N2	N3
Managing workload pressure	N2	N3
Professional currency and specialist literature	N2	N3
Guiding on the job	N1	N2
Applying workplace organisation and 5S	N1	N2

Skill	junior	medior
Business reporting	N1	N2

4 The proficiency scale

Level	Label	Autonomy	Complexity	Scope	Depth of knowledge
N1	Guided	works under supervision and follows instruction	routine, one variable at a time	own task	basic understanding of terminology
N2	Applying	works independently within set frameworks	familiar situations with limited variation	own role	working knowledge, applies standard approach
N3	Proficient	sets own approach and seeks input proactively	several variables, some ambiguity	own team or process	thorough knowledge, weighs alternatives
N4	Advanced	directs others and decides on the approach	complex, with conflicting interests	several teams or a department	in-depth knowledge, advises others
N5	Leading	sets the standard and the policy	strategic, under high uncertainty	organisation, value chain or profession	authority, advances the profession

5 Behavioural anchors per skill

Anchors sit at N1, N3 and N5. N2 and N4 are deliberately not anchored: raters interpolate between them, following the O*NET convention.

Skill	N1	N3	N5
Operating machines Operates production machines, processing machines or transport equipment according to work instructions and intervenes when the process threatens to run outside set values.	Starts and stops a machine according to the work instruction and alerts the operator at any deviation.	Operates several machines independently, adjusts operating values to product condition and keeps output within the standard.	Determines how machines are operated across the organisation, draws up operating protocols and decides on replacing or modifying installations.
Technical understanding Understands how machines, structures and installations work, recognises causes of failure and explains them using technical and physical principles.	Names the parts of a simple machine and explains, using the manual, what function each part has.	Independently explains the behaviour of an installation during a fault and traces the problem back to a technical principle.	Develops technical guidelines for the field and is consulted internally and externally on design and failure questions.

Skill	N1	N3	N5
Safety awareness Continuously watches for unsafe situations and actions at work, addresses others about them and chooses the safe working method even under time pressure.	Follows the safety rules of the workplace and checks back when in doubt about an operation.	Recognises unsafe situations in own process, intervenes and addresses colleagues without bringing the work to a halt.	Sets the safety standard for the organisation, makes safety discussable at every level and steers behaviour and culture.
Mechanical maintenance Carries out preventive and corrective maintenance on machines and tools, adjusts or replaces parts and records the work done.	Carries out a maintenance round under supervision using a checklist and reports deviations to the maintenance technician.	Independently diagnoses a machine fault, replaces the defective parts and sets the machine within tolerance.	Develops the maintenance concept for the machine park, sets intervals based on failure data and trains technicians.
Recognising and resolving machine faults Establishes where the cause of a fault lies, resolves simple defects personally and calls in maintenance for more complex failures.	Reports a fault together with its visible characteristics and shuts down the machine according to instruction.	Traces the cause of a fault systematically, resolves recurring defects personally and records the solution found.	Analyses fault patterns across installations, structurally improves the design or setting and trains fault teams in this.
Problem analysis Breaks a problem into parts, separates causes from effects and states which information is needed to move forward.	States precisely what deviates in a malfunction and which data are missing, and puts this to the supervisor.	Splits a recurring complaint into possible causes, tests these with own data and names the most likely cause.	Traces persistent organisational problems back to a few root causes and sets the analysis method that other teams will use.
Quality control Tests products, data or services against defined requirements, records deviations and sets corrections or improvements in motion.	Checks a product or file on the prescribed points according to instruction and records deviations.	Draws up a control plan for the own process, measures the quality and discusses the outcomes with those involved.	Sets up the quality system for several departments, chooses the measurement standards and accounts for results to client and regulator.

Skill	N1	N3	N5
Discipline and keeping commitments Sticks to agreements, procedures and commitments even without supervision, and reports in good time when a commitment turns out to be unachievable.	Arrives at the agreed time with the agreed work and reports any delay to the supervisor.	Commits only to what is feasible, tracks own commitments and informs those involved as soon as a deadline comes under pressure.	Anchors the standard for reliable follow through in working agreements and addresses anyone at any level who lets that standard slip.
Electrical engineering work Installs, measures and repairs electrical installations and control systems according to diagrams and safety rules, and makes the installation safe to work on.	Installs electrical components under supervision according to the diagram and uses the prescribed protective equipment.	Independently locates a fault in a control system, measures voltage and continuity and repairs it within the safety standard.	Draws up the company's electrical work instructions and safety rules and reviews installation designs for compliance with standards.
Reading and applying technical drawings Reads construction and installation drawings with dimensions and symbols and translates them into workable operations or production instructions.	Points out on a drawing the dimensions, symbols and views that belong to the own work.	Independently derives the correct dimensions from several drawings, spots contradictions and puts them to the designer.	Sets drawing conventions and information standards for projects and judges whether delivered drawing sets are workable.
Performing preventive maintenance Carries out scheduled cleaning, lubrication, inspections and replacements on machines and records the findings and the actions completed.	Carries out a fixed maintenance point according to the checklist and then signs off the completion.	Executes the full maintenance schedule of an installation, adapts frequency to wear and reports emerging defects.	Designs maintenance policy for the machine park, sets intervals based on data and accounts for the costs.
Spatial ability Imagines how objects, spaces or drawings look after rotating, folding or assembling them and uses that mental image in the work.	Points out the right route on a floor plan and names which side lies left or right of the entrance.	Derives the build up of the end product from a two dimensional drawing and reports where parts do not fit.	Thinks complex three dimensional set ups through in advance, predicts clashes between parts and sets the drawing conventions for the field.

Skill	N1	N3	N5
Accuracy and attention to detail Works carefully, checks own work for errors and keeps to agreements about completeness and correctness of data.	Goes through the own work with a checklist and repairs errors found before the work is passed on.	Builds check moments into the own process, keeps track of errors and prevents repetition by adjusting the method.	Sets the standards for completeness and correctness, has samples checked and addresses teams on structural sloppiness.
working in teams Contributing to a team result by dividing tasks, sharing information, keeping agreements and involving colleagues in the work at hand.	Carries out an own task within the team as agreed and reports to the team lead when something does not work.	Divides work with colleagues, shares information others need without being asked, and adjusts own planning to fit team goals.	Designs collaboration agreements for several teams in the organisation, evaluates them against results and revises them on the basis of data.
Demonstrating ownership Takes on the outcome of own work, does not point at circumstances or others and initiates repair actions when something falls short.	Reports an own mistake to the supervisor and asks which repair step should be taken first.	Repairs mistakes in own process unprompted, informs stakeholders and adjusts the working method to prevent a repeat.	Takes public responsibility for outcomes across the chain and organises that mistakes are used organisation wide to improve.
Working with digital devices and applications Uses computers, mobile devices and standard applications to carry out work tasks, adjusts settings and resolves simple usage problems without help.	Opens and uses the prescribed applications for own tasks and asks for help whenever an unfamiliar message appears.	Selects the appropriate device and application for each task and fixes common disruptions without support from others.	Defines organisation wide which digital workplace facilities are used and guides their introduction across all teams.
Measurement and calibration Takes measurements with measuring equipment, judges whether results fall within tolerance and keeps equipment calibrated and traceable.	Measures with calliper and dial gauge under supervision and notes the result on the measurement form.	Independently selects the right instrument for a tolerance requirement, weighs measurement uncertainty and passes or rejects the product.	Sets up the organisation's calibration management, writes measurement instructions and accounts for traceability during external audits.

Skill	N1	N3	N5
Sustaining pace in repetitive work Maintains a constant pace and constant quality in recurring operations throughout the shift and spreads the effort over the available time.	Completes the assigned series of operations at the pace indicated and reports when a backlog arises.	Sustains the pace for a full shift, builds in own rhythm and short recovery moments and stays within the quality standard.	Sets attainable pace standards for the team and organises the work so that quality is retained at high output.
Using personal protective equipment correctly Selects the protective equipment matching task and hazard, puts it on correctly and checks it for function, fit and shelf life.	Wears the prescribed protective equipment at the workplace and asks for replacement when damage is visible.	Determines per task which protective equipment is needed, checks it before use and instructs new colleagues in its use.	Sets protective equipment policy, selects suppliers on standards and wearing comfort and tracks compliance across the chain.
Managing workload pressure Keeps an overview when the volume of work rises, chooses what goes ahead and what does not, and puts the consequences to stakeholders.	Tells the supervisor that the work does not fit the available time and follows the choice that is made.	Cuts or shifts tasks independently when busy on the basis of importance, records this and discusses consequences with clients.	Redistributes work and capacity across departments in cases of structural overload and sets norms for sustainable workload distribution.
Professional currency and specialist literature Follows developments in the own profession through literature, guidelines and networks and works relevant new insights into own practice.	Reads the professional information received and names which part matters for the own work.	Tracks sources and guidelines structurally, weighs their quality and adapts the own working method to new insights.	Assesses the state of the field, weighs conflicting research and determines which guidelines the organisation will follow from now on.
Guiding on the job Guides a colleague or trainee during real work, gives targeted feedback on what was observed and builds up independence step by step.	Works alongside a new colleague, points out deviations in the operation and reports progress to the practice trainer.	Agrees with the person guided which tasks go solo, observes purposefully and discusses two concrete learning points afterwards.	Sets up workplace guidance for the organisation, trains the guides and keeps the quality of their coaching in view.

Skill	N1	N3	N5
Applying workplace organisation and 5S Arranges the workplace so that material, tools and information have fixed places, maintains that state and improves the layout step by step.	Tidies tools and material to the designated place after the shift and keeps the workplace clean.	Applies the five steps of 5S at own workplace, makes deviations visible and sustains the standard reached.	Rolls out workplace organisation across departments, links it to improvement goals and sustains compliance through audits.
Business reporting Bringing findings, figures and recommendations together in a report that leads the reader to a decision or next step in one reading.	Fills in an existing report template with the correct figures and describes per section what has been done.	Builds a report from question to conclusion, separates fact from interpretation and phrases recommendations with a named owner.	Sets the reporting line for the whole organisation, tests the quality of steering information and accounts for outcomes to board and regulator.

6 Assessment methods and validity

The validities are the corrected meta-analytic estimates from Sackett, Zhang, Berry and Lievens (2022) in the Journal of Applied Psychology, which replace the older Schmidt and Hunter (1998) figures. The spread matters as much as the mean: with a high SD, validity varies strongly by context.

Assessment method	rho	SD	What it is
Work sample test	0.33	0.09	The candidate performs a representative work sample under standardised conditions.
Knowledge test	0.40	0.13	Test of declarative job knowledge, usually assembled per client.
Situational Judgement Test	0.12	0.11	Scenario with response options, scored on knowledge or behavioural tendency.
Assessment centre	0.29	0.09	Multiple exercises, multiple assessors, dimension-wise scoring.
Personality questionnaire	0.40	0.15	Self-report of behavioural preferences. At hrmforce the Big Fifty and the 15PF.
Certificate or diploma	-	-	Formal proof of completed education or examination.
On-the-job observation	-	-	Structured workplace observation with a form based on behavioural anchors.
Cognitive ability test	0.41	0.14	Standardised test of verbal, numerical or abstract reasoning.
360-degree feedback	-	-	Multiple raters around the person rate behaviour against behavioural anchors.
Structured interview	0.42	0.19	Behaviour-based interview with fixed questions and a rating scale per question.
Portfolio or evidence	-	-	A collection of prior work or results, assessed against fixed criteria.

7 Assessment instruments for this job

hrmforce instrument	Skills	What it measures
Work sample test	13	Representative work sample under standardized conditions
Knowledge test (client-specific)	11	Professional knowledge test, customized for each client
Competency Check	8	Behavioral-Level Competency Assessment

hrmforce instrument	Skills	What it measures
Big Fifty	7	Personality questionnaire, 150 items, 25 factors
360 Feedback	5	Multiple assessments based on behavioral anchors
Ability Scan	3	Aptitude Test: Verbal, Numerical, and Abstract Reasoning Skills
15PF	1	Personality Profile, a shorter alternative to the Big Fifty
Pulse Survey	1	Periodic measurement at the team and organizational levels
Portfolio	1	Evaluation of prior work against fixed criteria

8 How to use this profile

1. Agree the profile with the hiring manager before the first candidate is measured. Weights shifted afterwards make the outcome indefensible.
2. Choose the assessment method per skill from the Assessment method column. Combine at most three methods per candidate.
3. Calibrate the assessors in a two-hour session using the anchors in chapter 5. Anchors without rater training deliver little.
4. Fill in the match calculator and discuss the gaps in the development conversation. Type A and type G are selection criteria, not one-quarter development goals.

Source: hrmforce Skills Framework 2.0, version 2.0.0, built 2026-09-08. Crosswalks to ESCO v1.2.1, O*NET 31.0, Lightcast Open Skills, SFIA 9, DigComp 3.0, EntreComp, LifeComp, GreenComp, AILit, WEF Future of Jobs 2025, ISCO-08 and the Dutch CBS occupational classification BRC 2014 edition 2025. This profile is a starting point, not a standard: align it with your own organisation before selecting on it.