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QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR LIFE SCIENCES INDUSTRY

Contents

What are Occupational Standards (OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

Introduction

Qualifications Pack- Fitter Mechanical – Life Sciences

SECTOR: LIFE SCIENCES

SUB-SECTOR: PHARMACEUTICAL, BIOPHARMACEUTICAL

OCCUPATION: MANUFACTURING

REFERENCE ID: LFS/Q0213

ALIGNED TO: NCO-2004/ NIL

Fitters are responsible for fitting/assembling the machine parts of the machinery that is used in making medicines or drugs.

Brief Job Description: Fitters is responsible for performing basic machining, fitting and assembly activities of machinery which includes using various joining, bolting, tightening techniques.

Personal Attributes: The individual should demonstrate mechanical aptitude and should be able to understand the directions given by the supervisor. The individual should understand the importance of maintaining hygiene and adherence to the laid down standard operating procedures for activities.

Job Details

Qualifications Pack Code	**LFS/Q0213**		
Job Role	**Fitter Mechanical – Life Sciences**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Sector	**Life Sciences**	**Drafted on**	**15/12/14**
Sub-sector	**Pharmaceutical and Biopharmaceutical**	**Last reviewed on**	
Occupation	**Manufacturing**	**Next review date**	
NSQC Clearance on	**20/07/2015**		

Job Role	**Fitter Mechanical – Life Sciences**
Role Description	Responsible for fitting/assembling the machine parts of the machinery that is used in making medicines or drugs.
NSQF level	3
Minimum Educational Qualifications	10+2
Maximum Educational Qualifications	Diploma/ ITI
Training (Suggested but not mandatory)	On the job training, welding experience preferred
Minimum Job Entry Age	18 Years
Experience	0-2 years
Applicable National Occupational Standards (NOS)	**Compulsory:** 1. LFS/ N 0260: Perform fitting and assembly operations on metal components 2. LFS/ N 0261: Perform maintenance activities on mechanical equipment / machines 3. LFS/N0204: Coordinate with shift supervisor, cross functional teams and within the team 4. LFS/N0101: Maintain a healthy, safe and secure working environment in the life sciences facility **Optional:**

	N.A.

Performance Criteria	As described in the relevant OS units

Definitions

Keywords /Terms	Description
Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate NOS they are looking for.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context.
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Organisational Context	Organisational Context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Scope	Scope is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of performance required.
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.

Sub-Sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Sub-functions	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Unit Code	Unit Code is a unique identifier for an NOS unit, which can be denoted with an '**N**'.
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.

Acronyms

Keywords /Terms	Description
NOS	National Occupational Standard(s)
NSQF	National Skill Qualifications Framework
NCO-2004	National Classification of Occupations-2004
OS	Occupational Standard(s)
QP	Qualifications Pack
GMP	Good Manufacturing Practices
SOP	Standard Operating Procedures

National Occupational Standard

Overview

This Occupational Standard describes the knowledge, understanding and skills required for a Fitter to perform the basic fitting and assembly activities of machinery to produce machinery of features as per given specifications.

LFS/N 0260 : Perform fitting and assembly operations on metal components

National Occupational Standard

Unit Code	**LFS/ N0260**
Unit Title (Task)	**Perform fitting and assembly operations on metal components**
Description	This unit covers the basic fitting and assembly activities to produce machinery of features as per given specifications. The candidate will be expected to carry out fitting and assembly activities with understanding of the types of equipment used, the manufacturing techniques, and the operating and safety procedures that are required. The candidate will use appropriate tools and equipment to mark out the material for the features to be produced, and then use hand tools, portable power tools, manually operated machine tools and shaping, fitting and assembly techniques appropriate to the operations being performed. These activities will include hand sawing, filing, drilling, tapping, reaming, surface grinding and assembly. During and on completion of the operations, the candidate will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. The candidate will need to be able to recognize when the activities are not meeting the required specification, and to discuss/determine what action needs to be taken to remedy any faults that occur, in order to ensure that the finished workpiece is within the specification requirements. On completion of the activities, the candidate will be expected to return all tools and equipment that they have used to the correct location, and to leave the work area in a safe and tidy condition. The candidate's responsibilities will require them to comply with health and safety requirements and organizational policy and procedures for the activities undertaken. The candidate will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out. The candidate's knowledge will provide an understanding of their work, and will enable them to apply appropriate machining, fitting and assembly techniques and procedures safely. The candidate will understand the machining, fitting and assembly processes, their application. The candidate will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification. The candidate will understand the safety precautions required when carrying out the various machining, fitting and assembly techniques, and when using hand tools and machinery. The candidate will be required to demonstrate safe working practices throughout, and will
Scope	The unit/ task covers the following: • Working safely • Preparing for general machining, fitting or assembling operations • Marking out the components • Performing general fitting operations • Performing assembling operations • Measuring and checking component

Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**

LFS/N 0260 :	Perform fitting and assembly operations on metal components
Working safely	The user/individual on the job should be able to: PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing broaching operations PC3. ensure work area is clean and safe from hazards **Hazards:** use of power tools, trailing leads or hoses, damaged or badly maintained tools and equipment; using files with damaged or poor fitting handles; using machine tools; handling of oils and grease; misuses of tools; not following laid-down maintenance procedures PC4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition PC5. ensure that all machines and machine tools are secured at all times
Preparing for general machining, fitting or assembling operations	The user/individual on the job should be able to: PC6. determine job requirement from job specification documents obtained from valid sources **Job requirements**: raw materials or components required (type, quality, quantity); dimensions; limits and tolerances; surface texture requirements; operations required (list, sequence and procedures where applicable); shape or profiles to be fabricated; cutting, bending and rolling allowances for fabricated forms; instruments and tools to be used; interdependencies; timelines **Job specification documents**: detailed component drawings; approved sketches/illustrations; national, international and organisational standards; reference tables and charts; fabrication/casting drawings **Valid source**: job instruction sheet/job card; work drawings and instructions; planning documentation; quality control documents; operation sheets; process specifications; instructions from supervisor PC7. establish the procedures to complete the general machining, fitting or assembling operations PC8. obtain the appropriate equipment, parts and accessories for the general machining, fitting or assembling operation **Equipment**: rollers and skates; crowbars; pull-lifts; lubricated plates **Parts**: assembly structure (framework, support, casings, panels); pre-machined components; shafts; levers/linkages; springs; fabricated components; chains; keys; belts; bearing; couplings; pulleys; gaskets; seals; sprockets; gears; pipework/hoses; bushes; cams and followers; other specific components **Accessories for assembling**: hooks, slings, eyebolts, shackles, chains, rings, special-to-purpose equipment, rules for the use of slings, trolleys

LFS/N 0260 : Perform fitting and assembly operations on metal components

	PC9. check that all measuring equipment is within calibration date **Measuring equipments**: external micrometers, vernier/digital/dial caliper, surface finish equipment (eg. comparison plates, machines), rules, squares, protractors, depth micrometers, depth verniers, feeler gauges, bore/hole gauges, slip gauges, radius/profile gauges, thread gauges, height gauge, hardness tester, dial test indicators (DTI), surface roughness tester, coordinate measuring machine (CMM), profile projectors, form testers
Marking out the components	The user/individual on the job should be able to: PC10. prepare/determine suitable datums from which to mark out (eg. choosing a machine face or filing a flat face as a datum) PC11. apply a marking medium to enhance clarity of the marking out PC12. use an appropriate method of marking out (eg. direct marking using instruments, use of templates or tracing/transfer methods) PC13. use a range of marking out equipment (eg. rules, squares, scribers, vernier instruments) **Marking tools**: rules/tapes, dividers/trammels, scribers, punches, scribing blocks, squares, protractor, permanent markers PC14. mark out a range of features **Features**: datum lines; cutting guidelines; square and rectangular profiles; circular and radial profiles; angles; holes linearly positioned, boxed and on pitch circles
Performing general fitting operations	The user/individual on the job should be able to: PC15. cut and shape the materials to the required specification, using appropriate tools and techniques PC16. use a range of hand fitting methods for fitting operations **Hand fitting**: cutting out the rough profile using saws (eg. hacksaw, band saw), cutting a screw thread (eg. tapping or dieing), filing (flat, square, curved), drilling holes, reaming of holes, scrabbing of parts PC17. Use a range of manually operated machines for performing machining operations **Manually operated machine tools: manual grinding machines** (Ag4, wolf grinding machine, etc.), drills (power drills, pedestal drills), punching machines, threading machines

LFS/N 0260 :	Perform fitting and assembly operations on metal components
Performing assembling operations	The user/individual on the job should be able to: PC18. use appropriate methods and techniques to assemble and secure the components and sub-assemblies in their correct positions **Methods:** assembling components having interference fits (eg. by pressure, expansion or contraction); securing components using threaded fasteners (eg. nuts, bolts, machine screws, cap screws); securing components using spring clips (eg. external circlips, internal circlips, special clips); using locking and retaining devices (eg. tab washers, locking nuts, wire locks, special purpose types); securing components using rivets (eg. countersunk, roundhead, blind, special purpose types); applying sealing compounds or adhesives; electrical bonding of components; setting and adjusting components to give correct working parameters (eg. shimming and packing); torque setting of nuts and bolts PC19. drill, tap and ream locating holes as required to permanently locate components PC20. fasten components permanently using methods such as using engineered fasteners, applying adhesives, soldering and brazing PC21. produce mechanical assemblies as per job specifications PC22. dismantle mechanical assemblies without damage to components and/or subassemblies **Methods to dismantle**: procedure for isolation and locking off a device/system; sequence of operations used to dismantle a device/system; proof marking, correct storage procedures for removed parts; release of pressure/force; extraction PC23. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve PC24. keep the work area in a safe and tidy condition during and on completion of the manufacturing activities PC25. return all tools and equipment to the correct location on completion of the fitting activities support the customer remotely over the internet to test potential solutions **Fitting activities**: file flat, square and curved surfaces and achieve a smooth surface finish; select saw blades for different materials, and how to set the saw blades for different operations; produce screw threads on workpieces using hand dies; tighten torque with torque wrenches; determine the drill size

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	for tapped holes, and the importance of using the taps in the correct sequence
Measuring and checking component	The user/individual on the job should be able to: PC26. perform the necessary checks for dimensional accuracy **Dimensions:** linear dimensions (eg. lengths, depths), diameters (eg. external, internal), flatness, squareness, angles, profiles, hole size and position, thread size and fit PC27. use the appropriate measuring equipment for checking activities PC28. produce components within all of the applying standards **Components quality standards:** components to be free from false tool cuts, burrs and sharp edges; dimensional tolerance +/-0.020mm; flatness and squareness 0.05mm; angles within +/- 1 degree; screw threads to fit as per standard; reamed and bored holes within interference: - 0.025mm (hole) + 0.025mm (shaft), transition: - 0.1mm (hole) + 0.1 (shaft) , clearance: 50microns; radius: 0.5 r; surface finish 63µin or 1.6 µm PC29. generate stage inspection reports
Knowledge and Understanding (K)	
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	The user/individual on the job needs to know and understand: KA1. legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. relevant health and safety requirements applicable in the work place KA3. importance of working in clean and safe environment in life sciences Industry KA4. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities KA5. reporting structure, inter-dependent functions, lines and procedures in the work area KA6. relevant people and their responsibilities within the work area KA7. escalation matrix and procedures for reporting work and employment related issues KA8. documentation and related procedures applicable in the context of employment and work KA9. importance and purpose of documentation in context of employment and work
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. how to extract and use information from engineering drawings and related specifications in relation to work undertaken KB2. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing (Geometric Dimensioning and Tolerancing -- GD&T)

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	KB3. preparation of materials in readiness for the marking out activities, in order to enhance clarity, accuracy and safety KB4. selection and establishment of a suitable datum KB5. importance of ensuring that marking out is undertaken from the selected datum KB6. possible effects of working from an incorrect datum KB7. mark-out conventions when marking out the workpiece KB8. various fitting activities to be carried out Fitting activities: file flat, square and curved surfaces and achieve a smooth surface finish; select saw blades for different materials, and how to set the saw blades for different operations; produce screw threads on workpieces using hand dies; tighten torque with torque wrenches; determine the drill size for tapped holes, and the importance of using the taps in the correct sequence KB9. methods of holding the workpiece for the hand fitting, drilling threading and taping activities KB10. how to mount workpiece KB11. assembly methods, techniques and procedures to be used Methods: assembling components having interference fits (eg. by pressure, expansion or contraction); securing components using threaded fasteners (eg. nuts, bolts, machine screws, cap screws); securing components using spring clips (eg. external circlips, internal circlips, special clips); using locking and retaining devices (eg. tab washers, locking nuts, wire locks, special purpose types); securing components using rivets (eg. countersunk, roundhead, blind, special purpose types); applying sealing compounds or adhesives; electrical bonding of components; setting and adjusting components to give correct working parameters (eg. shimming and packing); torque setting of nuts and bolts KB12. how the components are to be aligned, adjusted and positioned prior to securing them, and the tools and equipment Alignment: slideways: flat, vee, dovetail, cylindrical, comparison of their capabilities, main features, accuracy of movement, means of adjustment, lubrication, protection; stick-slip: definition, recirculating ball leadscrews, hydrostatic slides; typical checks: coaxial alignment between main spindle axis, coaxial alignment between two spindles, alignment of spindle to guideway, squareness of slideways movement, concentricity and end float of spindle, squareness of planes to spindle, setting of guards, stops and automatic safety cut-outs; bearings: plain bush (radial, radial and axial) ball (radial, axial, radial and axial) roller (radial, axial, radial and axial); methods of alignment: standard tests, straight edge, precision level, autocollimator and reflector, roundness measuring machine KB13. various mechanical fastening devices that are used Mechanical fastenings and joining techniques: non-permanent - nuts, bolts, studs, screws, pins, springs, keys, bearings, permanent - welded, soldered, brazed, riveted KB14. how to mount and secure the cutting tools in the tool holding devices Workholding devices: bench / machine vice; clamps (eg. toolmaker's); three-jaw chuck; four-jaw chuck; collet chuck; drive plate and centres; magnetic chucks(holding devices); special purpose tool holders (3R for holding electrodes) KB15. techniques of taking trial cuts and checking dimensional accuracy KB16. the application of roughing and finishing cuts, and the effect on tool life, surface finish and dimensional accuracy

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	KB17. application of cutting fluids and compounds with regard to a range of different materials, and why some materials do not require cutting fluids to be used Range of Materials: Ferrous metals: eg. carbon steels, stainless steels, cast iron, tool steel, hard metals; Non-ferrous metals: eg. bronze, aluminium, copper and copper alloys KB18. effects of coolant concentration and machining temperature on the job being undertaken KB19. how to check the workpiece and the measuring equipment that is used **Measuring equipments**: external micrometers, vernier/digital/dial caliper, surface finish equipment (eg. comparison plates, machines), rules, squares, protractors, depth micrometers, depth verniers, feeler gauges, bore/hole gauges, slip gauges, radius/profile gauges, thread gauges, height gauge, hardness tester, dial test indicators (DTI), surface roughness tester, coordinate measuring machine (CMM), profile projectors, form testers KB20. need to check that the measuring equipment is within current calibration dates, and that the instruments are correctly zeroed KB21. measuring internal and external dimensions KB22. measuring geometric features KB23. the importance of leaving the work area and equipment in a safe and clean condition on completion of fitting activities KB24. importance of GMP and implications of non-adherence
Skills (S)	
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language SA2. use basic office applications like spread sheet, word processor SA3. use ERP software and other organizational software specific to manufacturing, quality and maintenance function SA4. use email to communicate within the organization as per organization guidelines
	Reading and Understanding Skills
	The user/individual on the job needs to know and understand how to: SA5. read and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language
	Oral Communication (Listening and Speaking Skills)
	The user/individual on the job needs to know and understand how to: SA6. convey and share technical information clearly using appropriate language SA7. check and clarify task-related information SA8. liaise with appropriate authorities using correct protocol SA9. communicate with people in respectful form and manner in line with organizational protocol SA10. clarify task related information with appropriate personnel or technical adviser

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	SA11. seek to improve and modify own work practices SA12. exercise restraint while expressing dissent and during conflict situations SA13. identify and clarify work roles within a team SA14. communicate and cooperate with others in the team for better results SA15. seek assistance from fellow team members, if needed
B. Professional Skills	**Plan and Organize**
	The user/individual on the job needs to know and understand how to: SB1. plan, prioritize and sequence work operations as per job requirements SB2. organize and analyse information relevant to work SB3. use basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time SB4. avoid and manage distractions to be disciplined at work SB6. manage own time for achieving better results SB7. work in a team in order to achieve better results
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB8. undertake numerical operations, and calculations/ formulae **Numerical computations**: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages SB9. identify and draw various basic, compound and solid shapes as per dimensions given **Basic shapes**: square, rectangle, triangle, circle **Compound shapes**: involving squares, rectangles, triangles, circles, semi-circles, quadrants of a circle **Solid shapes**: cube, rectangular prism, cylinder SB10. use appropriate measuring techniques and units of measurement SB11. use appropriate units and number systems to express degree of accuracy **Units and number systems representing degree of accuracy**: decimals places, significant figures, fractions as a decimal quantity SB12. interpret and express tolerance in terms of limits on dimensions SB13. calculation of the value of angles in a triangle **Angles in a triangle**: right-angled, isosceles, equilateral
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB14. identify problems with work planning, procedures, output and behaviour and their implications SB15. prioritize and plan for problem solving SB16. communicate problems appropriately to others SB17. identify sources of information and support for problem solving SB18. seek assistance and support from other sources to solve problems SB19. identify effective resolution techniques SB20. select and apply resolution techniques SB21. seek evidence for problem resolution SB22. undertake and express new ideas and initiatives to others

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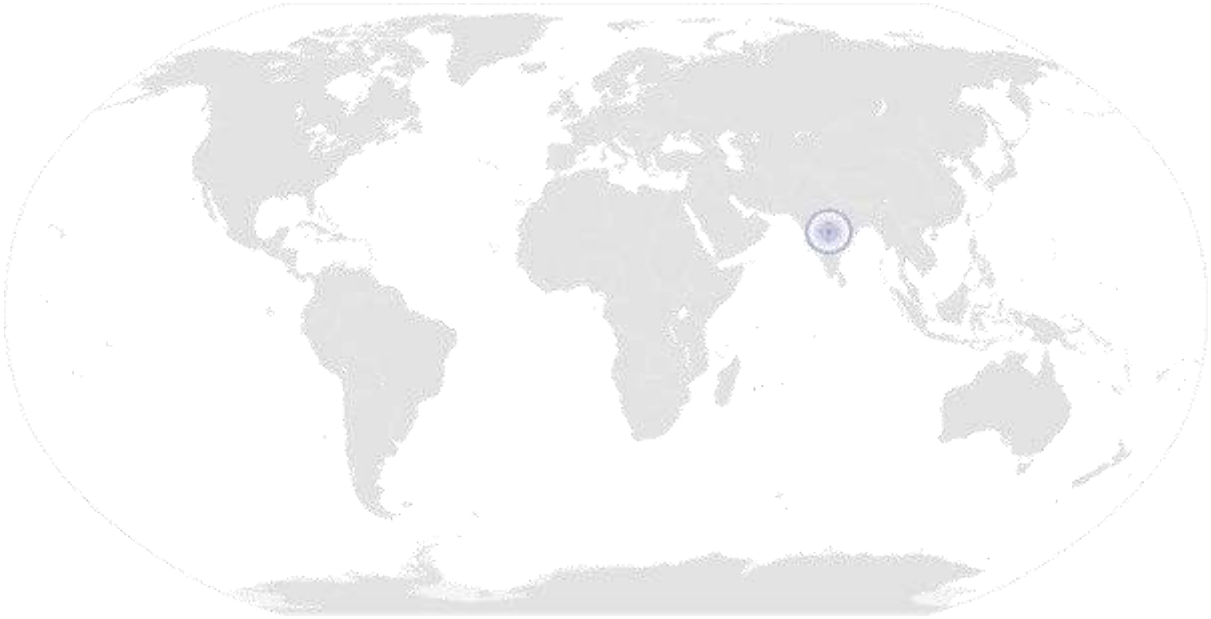
	SB23. participate in improvement procedures including process, quality and internal/external customer/supplier relationships
	Decision Making
	The user/individual on the job needs to know and understand how to: SB24. take decision with respect to his/ her own work without affecting others in team/ work plan SB25. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses and inform supervisor SB26. appropriately use the escalation matrix for complex decisions
	Customer Centricity
	Not Applicable
	Critical Thinking
	Not Applicable

NOS Version Control

NOS Code	LFS/ N0260		
Credits(NSQF)	TBD	Version number	1.0
Industry	Life Sciences	Drafted on	11/01/15
Industry Sub-sector	Pharmaceutical and Biopharmaceutical	Last reviewed on	26/03/15
Occupation	Manufacturing	Next review date	01/06/17

LFS/ N 0261 : Perform maintenance activities on mechanical equipment/ machinery

National Occupational Standard



Overview

This Occupational Standard describes the knowledge, understanding and skills required of a Fitter to carry out maintenance activities on a range of mechanical equipment including include gearboxes, machine tools, lifting and handling equipment, processing plant, production plant, engines, pumps, process control valves, compressors, transfer equipment, mechanical structures and work holding devices, as per approved procedures.

LFS/ N 0261 : Perform maintenance activities on mechanical equipment/ machinery

National Occupational Standard

Unit Code	**LFS/ N 0261**
Unit Title (Task)	**Perform maintenance activities on mechanical equipment/ machinery**
Description	This unit covers performing maintenance activities on mechanical equipment, as per approved procedures. As part of the team the candidate will be required to maintain a range of mechanical equipment which could include gearboxes, machine tools, lifting and handling equipment, processing plant, production plant, engines, pumps, process control valves, compressors, transfer equipment, mechanical structures and work holding devices. The candidate will be expected to work safely, with minimal supervision, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out.
Scope	This unit/task covers the following: • Working safely • Preparing for mechanical maintenance operations • Performing mechanical maintenance operations

Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Working Safely	The user/individual on the job should be able to: PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing fabrication and fitting operations PC3. work following laid down procedures and instructions PC4. ensure work area is clean and safe from hazards PC5. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition PC6. follow all relevant setting up and operating specifications for the products or mechanical equipment being commissioned PC7. follow the defined procedures and set up the equipment correctly ensuring that all operating parameters are achieved
Preparing for mechanical maintenance operations	The user/individual on the job should be able to: PC8. obtain job specifications and requirements from valid sources and find out the fault **Valid sources**: job instruction sheet/job card, maintenance log book/card/sheet, instructions from supervisor, instructions from user of the equipment, condition of end product, person or operator who reported the fault, sensory input (sight, sound, smell, touch), monitoring equipment or gauges, plant/machinery records, recording devices PC9. obtain and interpret drawings, specifications, manufacturers' manuals and other documents needed in the maintenance process PC10. follow the procedure to be adopted to establish the background of the fault and the tools to be used

LFS/ N 0261 : Perform maintenance activities on mechanical equipment/ machinery

	Tools: e.g. allen key, spanner, torque wrench, pliers, bearing puller, circlip plier, scraper(flat & triangular), etc PC11. evaluate various types of information available for fault diagnosis PC12. evaluate sensory information to assess likely faults eg. sound, visual PC13. collect evidence regarding the fault from the sources using a range of diagnostic equipment and techniques **Fault diagnostic techniques**: half-split technique; emergent sequence; unit substitution; input/output; function/performance testing; six point technique; injection and sampling; equipment self-diagnostics **Diagnostic equipment**: manufacturer's manual, physical layout diagrams, algorithms, flow charts, probability charts/reports, fault analysis charts (eg. fault trees), equipment self-diagnostics, trouble shooting guides, machine assembly layout PC14. apply monitoring or testing procedures to help in the fault diagnosis using a range of test equipment **Monitoring or testing procedures:** alignment checks, force/pressure checks (eg. spring pressure, hydraulic or pneumatic pressures), leakage, vibration, thermal checks (eg. bearings, friction surfaces), movement checks (eg. travel, clearance, levers, links), visual checks **Test equipment:** measuring instruments/devices, thermal indicators, dial test indicators, audio test devices, torque measuring devices, self-diagnostic equipment, other specific test equipment PC15. relate previous reports/records of similar fault conditions PC16. evaluate the likely risk of running the equipment with the displayed fault, and the effects the fault could have on health and safety, and on the overall process or system
Performing mechanical maintenance operations	The user/individual on the job should be able to: PC17. carry out the maintenance activities in the specified sequence and in an agreed timescale PC18. carry out maintenance activities on various equipment **Equipment :** gearboxes; machine tool; lifting and handling equipment; processing plant; production plant; engines; pumps; process control valves; compressors; transfer equipment; mechanical structures; workholding devices(bench vice; machine vice; clamps (eg. toolmaker's); three-jaw chuck; four-jaw chuck; collet chuck; drive plate and centres; jigs and fixtures) PC19. perform dismantling processes mechanical equipment using appropriate method or technique in order to replace defective components **Dismantling processes**: eg. release of pressures/force, proofmarking of components, removal of components by extraction or pressing, etc. **Range of components**: shafts; couplings; gears; clutches; valves and seats; pistons; splined components; brakes; bearing and seals; fitting keys; springs; diaphragms; cams and followers; chains & sprockets; pulleys and belts; levers and links; slides; rollers; tooling; fluid storage units; fabricated components; wire ropes/cables; housings; actuating mechanisms; structural/operational components; locking & retaining devices (eg. circlips, pins, lock nuts); covers and casings; integrated modules; other specific components

LFS/ N 0261 : Perform maintenance activities on mechanical equipment/ machinery

	Methods and techniques: release of pressures/forces, proof marking, extraction, pressing, alignment PC20. re-assemble the components using appropriate methods, and adjust them to meet the operating specification **Adjustments**: setting working clearance, setting travel, setting backlash in gears, preloading bearings, bearing pressing, lubrication oil/grease to be added **Methods to produce mechanical assemblies**: assembling components having interference fits (eg. by pressure, expansion or contraction); securing components using threaded fasteners (eg. nuts, bolts, machine screws, cap screws); securing components using spring clips (eg. external circlips, internal circlips, special clips); using locking and retaining devices (eg. tab washers, locking nuts, wire locks, special purpose types); securing components using rivets (eg. countersunk, roundhead, blind, special purpose types); applying sealing compounds or adhesives; electrical bonding of components; setting and adjusting components to give correct working parameters (eg. shimming and packing); torque setting of nuts and bolts; sby welding PC21. carry out servicing and maintenance techniques as applicable **Maintenance techniques**: installing, dismantling and reinstalling equipment to unit/sub-assembly level; installing, dismantling and reinstalling units to component level; proof marking/labelling of components; checking components for serviceability; replacing all lifed items (eg. seals, bearings, gaskets); replacing damaged/defective components; setting, aligning and adjusting replaced components; tightening fastenings to the required torque; making 'off-load' checks before starting up; replenishing oils and greases; safety system checks; functionally testing the completed system; check leveling PC22. replace or refit basic hydraulic and pneumatic components **Components:** valves; seals; buckets; solenoid operated cylinders; clamping and positioning components; other basic components PC23. identify requirements for welding, machining, electric or electronic repair and handover to the relevant personal after following due process PC24. conduct a trial run of the equipment at full power/speed/flow PC25. confirm that the produced component/process outcomes meet specifications **Specifications:** components to be free from false tool cuts, burrs and sharp edges; dimensional tolerance +/- 0.25mm or +/- 0.010"; flatness and squareness 0.05mm per 25mm; angles within +/- 1 degree; screw threads to Medium fit; reamed holes within H8; surface finish 1.6 µm; minimum downtime of utilities; leveling PC26. monitor and record measurements and observations PC27. review and update maintenance procedures and plans **Procedures and plans:** e.g. preventive maintenance (routine inspections, and adjustments); corrective maintenance (activities identified from preventative maintenance activities); predictive maintenance (analysis of the equipment's

LFS/ N 0261 : Perform maintenance activities on mechanical equipment/ machinery

	condition); reactive maintenance (unexpected equipment/component failure); maintenance prevention (equipment/component design and development); equipment performance, equipment downtime/failure; overall equipment effectiveness (OEE); maintenance costs; health and safety, staff development and training; maintenance procedures/instructions; operator manuals/working instructions; regulatory compliance PC28. deal with equipment malfunction and rectify faults during the breakdown servicing process as appropriate **Breakdown categories**: intermittent problem, partial failure/out-of-specification output, complete breakdowns, preventive maintenance PC29. identify areas of improvements in the various maintenance services and implement the improvement activities agreed upon by the relevant authorities **Areas:** equipment downtime during maintenance; equipment; performance monitoring systems; overall equipment effectiveness (OEE); maintenance procedures; operator instructions; visual management; systems/documentation; resource planning; costs; staff development and training; health and safety; procurement PC30. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve to ensure zero idle time of machine/ equipment PC31. leave the work area in a safe and tidy condition on completion of the manufacturing activities
Knowledge and Understanding (K)	
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	The user/individual on the job needs to know and understand: KA1. legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. relevant health and safety requirements applicable in the work place KA3. importance of working in clean and safe environment KA4. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities KA5. reporting structure, inter-dependent functions, lines and procedures in the work area KA6. relevant people and their responsibilities within the work area KA7. escalation matrix and procedures for reporting work and employment related issues KA8. documentation and related procedures applicable in the context of employment and work KA9. importance and purpose of documentation in context of employment and work KA10. service request procedures, tools, and techniques KA11. company policy on repair/replacement of components during the maintenance process KA12. organizational procedure(s) to be adopted for the safe disposal of waste of all types of materials

LFS/ N 0261 : Perform maintenance activities on mechanical equipment/ machinery

B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. health and safety requirements, and safe working practices and procedures required for the mechanical maintenance activities undertaken **Safe working practices and procedures**: ensuring the correct isolation of the machine before mounting work holding devices and tooling; fitting and adjusting machine guards; ensuring that the work piece is secure and that tooling is free from work piece before starting the machine; ensuring personal protective equipment (PPE) to be worn for the maintenance activities eg. correctly fitting overalls and safety glasses; ensuring long hair is tied back or netted; jewellery or other items that can become entangled in the machinery are removed KB2. hazards associated with the mechanical maintenance activities and how they can be minimized Hazards: handling oils; greases; stored pressure/force; misuse of tools; using damaged or badly maintained tools and equipment; not following laid-down maintenance procedures KB3. isolation and lock-off procedures or permit-to-work procedure that applies KB4. how to extract and use information from engineering drawings and related specifications in relation to work undertaken KB5. how to interpret first and third angle drawings, KB6. British and metric systems of measurement, KB7. procedure(s) to be followed for investigating the faults, and how to deal with intermittent faults KB8. how to analyse and evaluate possible characteristics and causes of specific faults/problems KB9. procedure for obtaining replacement parts, materials and other consumables necessary for the maintenance activities KB10. sequence to be adopted for the dismantling/re-assembly of various types of assemblies KB11. methods and techniques used to dismantle/assemble mechanical equipment **Methods and techniques**: release of pressures/forces, proof marking, extraction, pressing, alignment Methods to produce mechanical assemblies: assembling components having interference fits (eg. by pressure, expansion or contraction); securing components using threaded fasteners (eg. nuts, bolts, machine screws, cap screws); securing components using spring clips (eg. external circlips, internal circlips, special clips); using locking and retaining devices (eg. tab washers, locking nuts, wire locks, special purpose types); securing components using rivets (eg. countersunk, roundhead, blind, special purpose types); applying sealing compounds or adhesives; electrical bonding of components; setting and adjusting components to give correct working parameters (eg. shimming and packing); torque setting of nuts and bolts; sby welding KB12. methods of checking components are fit for purpose, and how to identify defects and wear characteristics KB13. basic principles of how the equipment functions, operation sequence, the working purpose of individual units/components and how they interact KB14. identification, application, fitting and removal of different types of bearings and gears KB15. how to correctly adjust tension belts and chains KB16. identification and application of different types of locking devices

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	KB17. methods of checking that removed components are fit for purpose, and the need to replace `lifed' items KB18. uses of measuring equipment **Measuring equipment:** external micrometers, vernier/digital/dial caliper, surface finish equipment (eg. comparison plates, machines), rules, squares, protractors, depth micrometers, depth verniers, feeler gauges, bore/hole gauges, slip gauges, radius/profile gauges, thread gauges, tachometers, torque wrenches, sprit levels KB19. how to make adjustments to components/assemblies to ensure they function correctly Adjustments: setting working clearance, setting travel, setting backlash in gears, preloading bearings, bearing pressing KB20. importance of making `off-load' checks before running the equipment under power KB21. how to check tools and equipment are free from damage or defects, are in a safe and usable condition, and are configured correctly for the intended purpose KB22. importance of maintenance documentation and/or reports following the maintenance activity, and how to generate them **Maintenance documentation:** e.g. job cards; permit to work/formal risk assessment and/or sign-on/off procedures; maintenance log or report; company-specific recording system(manual or computerized) KB23. equipment operating and control procedures to be applied during the maintenance activity **Operating and control procedures**: organisational guidelines and procedures; equipment manufacturer's operating specification/range; recognised compliance agency/body standards or directives; health, safety and environmental requirements; customer standards and requirements KB24. how to use lifting and handling equipment in the maintenance activity KB25. problems associated with the maintenance activity, and how they can be overcome KB26. extent of their own authority and to whom they should report if they have a problem that they cannot resolve KB27. how to extract and use information from engineering drawings and related specifications in relation to work undertaken KB28. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing KB29. the methods of positioning, aligning and securing the workpiece KB30. assembly methods, techniques and procedures to be used **Methods:** assembling components having interference fits (eg. by pressure, expansion or contraction); securing components using threaded fasteners (eg. nuts, bolts, machine screws, cap screws); securing components using spring clips (eg. external circlips, internal circlips, special clips); using locking and retaining devices (eg. tab washers, locking nuts, wire locks, special purpose types); securing components using rivets (eg. countersunk, roundhead, blind, special purpose types); applying sealing compounds or adhesives; electrical bonding of components; setting and adjusting components to give correct working parameters (eg. shimming and packing); torque setting of nuts and bolts; by welding KB31. how the components are to be aligned, adjusted and positioned prior to securing them, and the tools and equipment

LFS/ N 0261 : Perform maintenance activities on mechanical equipment/ machinery

	Tools and equipment: clamping direct to machine table, pneumatic or magnetic table; machine vice (eg. plain, swivel, universal); angle plate; vee block and clamps; fixtures; chucks (eg. 3, 4 jaw); indexing head/device; rotary table; magnetic chucks; in a bench vice; collets KB32. various mechanical fastening devices that are used Fastening devices: nuts; bolts; machine screws; cap screws; clips; pins; locking and retaining devices; rivets KB33. techniques of taking trial cuts and checking dimensional accuracy KB34. application of cutting fluids and compounds with regard to a range of different materials, and why some materials do not require cutting fluids to be used KB35. how to check the workpiece and the measuring equipment that is used KB36. need to check that the measuring equipment is within current calibration dates, and that the instruments are correctly zeroed KB37. when to act on their own initiative and when to seek help and advice from others KB38. importance of leaving the work area and equipment in a safe and clean condition on completion of the machining and fitting activities KB39. knowledge of GMP, 5-S and TPM guidelines
Skills (S)	
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language
	Reading Skills
	The user/ individual on the job needs to know and understand how to: SA2. read and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language
	Oral Communication (Listening and Speaking Skills)
	The user/ individual on the job needs to know and understand how to: SA3. check and clarify task-related information SA4. liaise with appropriate authorities using correct protocol SA5. convey and share technical information clearly using appropriate language SA6. communicate with people in respectful form and manner in line with organizational protocol SA7. clarify task related information with appropriate personnel or technical adviser SA8. seek to improve and modify own work practices SA9. undertake and express new ideas and initiatives to others SA10. exercise restraint while expressing dissent and during conflict situations SA11. identify and clarify work roles within a team SA12. communicate and cooperate with others in the team for better results SA13. seek assistance from fellow team members

LFS/ N 0261 : Perform maintenance activities on mechanical equipment/ machinery

B. Professional Skills	**Problem Solving**
	The user/individual on the job needs to know and understand how to: SB1. identify problems with work planning, procedures, output and behaviour and their implications SB2. prioritize and plan for problem solving SB3. communicate problems appropriately to others SB4. identify sources of information and support for problem solving SB5. seek assistance and support from other sources to solve problems SB6. identify effective resolution techniques SB7. select and apply resolution techniques SB8. seek evidence for problem resolution SB9. participate in improvement procedures including process, quality and internal/external customer/supplier relationships
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB10. plan, prioritize and sequence work operations as per job requirements SB11. organize and analyse information relevant to work SB12. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time SB13. avoid and manage distractions to be disciplined at work SB14. manage own time for achieving better results
	Analytical Skills
	The user/individual on the job needs to know and understand how to: SB15. undertake basic numerical computations and calculations **Numerical computations**: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages SB16. identify and draw various basic, compound and solid shapes as per dimensions given **Basic shapes**: square, rectangle, triangle, circle, quadrilaterals **Compound shapes**: involving squares, rectangles, triangles, circles, semi-circles, quadrants of a circle **Solid shapes**: cube, rectangular prism, cylinder SB17. use appropriate measuring techniques and units of measurement SB18. use appropriate units and number systems to express degree of accuracy **Units and number systems representing degree of accuracy**: decimals places, significant figures, fractions as a decimal quantity SB19. calculations related to force and pressure relevant to operating/testing the machines to be maintained
	Decision Making
	The user/individual on the job needs to know and understand how to: SB20. take decisions with respect to his/her work without affecting others work/ action plan

LFS/ N 0261 : Perform maintenance activities on mechanical equipment/ machinery

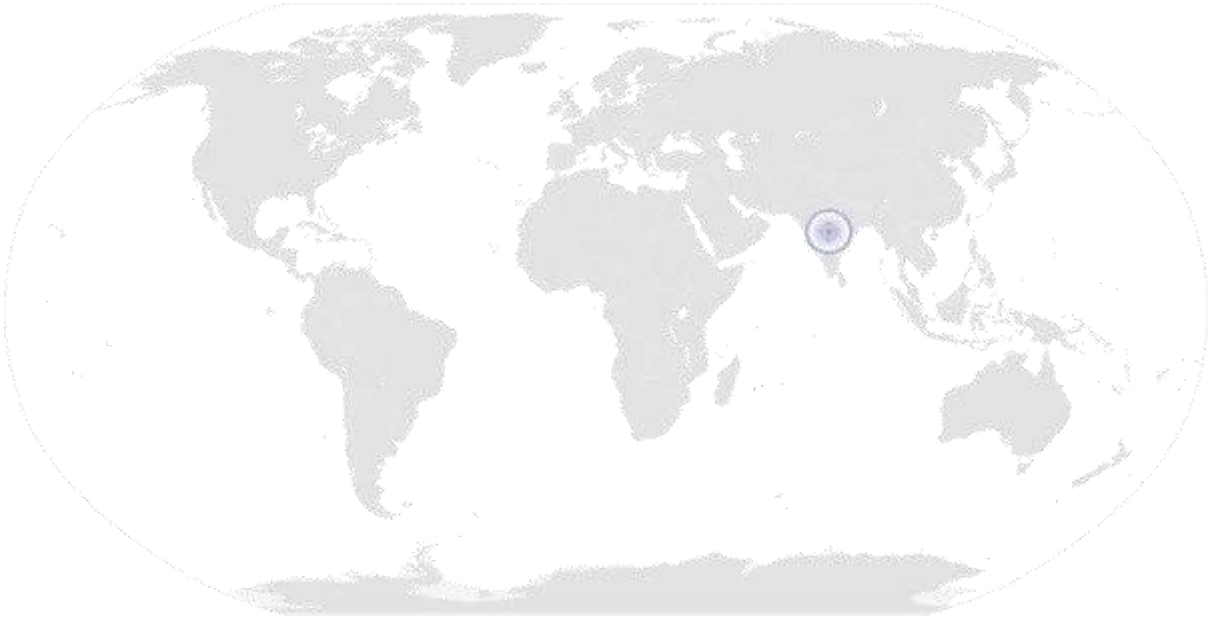
	SB21. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses and inform supervisor SB22. appropriately use the escalation matrix for complex decisions
	Customer Centricity
	Not Applicable
	Critical Thinking
	Not Applicable

NOS Version Control

NOS Code	LFS/ N0261		
Credits(NSQF)	TBD	Version number	1.0
Industry	Life Sciences	Drafted on	11/01/15
Industry Sub-sector	Pharmaceutical and Biopharmaceutical	Last reviewed on	26/03/15
Occupation	Manufacturing	Next review date	01/06/17

LFS/N0204 : Coordinate with Shift Supervisor, cross functional teams and within the team

National Occupational Standard



Overview

This Occupational Standard describes the knowledge, understanding and skills required of a Fitter to work as a team member and multi-task in order to achieve production on schedule and meeting the quality requirements.

LFS/N0204 : Coordinate with Shift Supervisor, cross functional teams and within the team

National Occupational Standard

Unit Code	**LFS/N0204**
Unit Title (Task)	**Coordinate with Shift Supervisor, cross functional teams and within the team**
Description	This NOS unit is about communicating with colleagues (both within team & cross-functional) and seniors in order to achieve smooth and hazard-free work flow during production
Scope	This unit/task covers the following: Interact with Immediate Supervisor • receive work instructions from reporting supervisor • communicate to reporting supervisor about process-flow improvements and production defects received from previous process • communicate any potential hazards or expected process disruptions • communicate maintenance and repair schedule proactively to the supervisor • handover completed work to supervisor Interact with colleagues within the team • work as a team with colleagues and share work as per their or own work load and skills • communicate and discuss work flow related difficulties in order to find solutions with mutual agreement Interact with colleagues from cross functional teams • receive feedback from Quality Control and Quality Assurance and rework in order to complete work on time • provide support to Quality Assurance team during audits • coordinate with maintenance team for any breakdowns and for preventive and corrective maintenance • Coordinate with Stores to receive material in time

Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Interact with Immediate Supervisor	To be competent, the user/individual on the job must be able to: PC1. understand the work output requirements PC2. understand the quality standards to be maintained PC3. proactively inform supervisor on issues requiring intervention PC4. comply with company policy and rule
Interact with colleagues within the team	PC5. deliver quality work on time and report any anticipated reasons for delays PC6. be able to resolve conflicts
Interact with colleagues from cross functional teams	PC7. multi-task relevant activities to align with team goals PC8. put team over individual goals

LFS/N0204 : Coordinate with Shift Supervisor, cross functional teams and within the team

Knowledge and Understanding (K)	
B. Organisational Context (Knowledge of the Company/ Organisation and its processes)	The user/individual on the job needs to know and understand: KA1. company's vision, policies on: preferred language of communication, reporting and escalation policy, quality delivery standards, and personnel management KA2. reporting structure
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. communicate effectively KB2. build team coordination
Skills (S)	
A. Core Skills/ Generic Skills	**Writing skills**
	The user/ individual on the job needs to know and understand how to: SA1. read job sheets and interpret technical details mentioned in the job sheet
	Reading skills
	The user/individual on the job needs to know and understand how to: SA2. read notes/comments from the supervisor
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA3. Interact (speak and listen) with team members to work efficiently SA4. be clear and concise in communicating
B. Professional Skills	**Decision making**
	The user/individual on the job needs to know and understand how to: SB1. spot and communicate potential areas of disruptions to work process and report the same SB2. when to report to supervisor and when to deal with a colleague individually, depending on the type of concern
	Plan & Organize
	The user/individual on the job needs to know and understand how to: SB1. plan and organize assigned work in order to achieve specified targets and deadlines

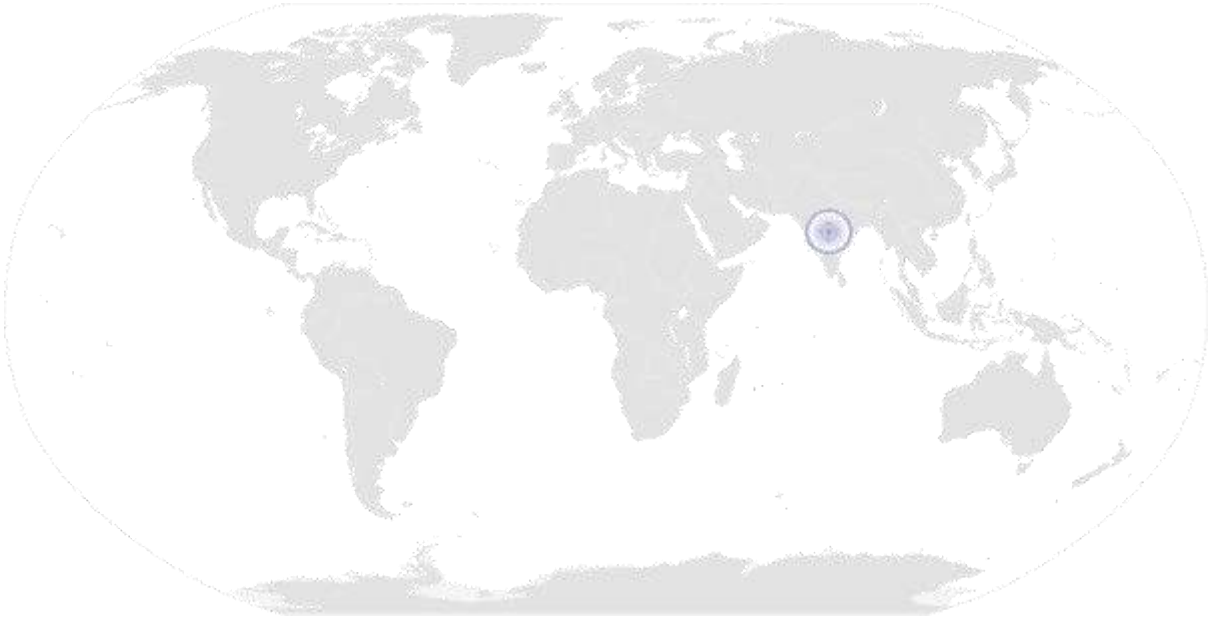
LFS/N0204 : Coordinate with Shift Supervisor, cross functional teams and within the team

	SB2. multi-task and adapt to meet work timelines SB3. establish rapport and effective working relationships with different team members and other teams to deliver planned work
	Analytical thinking
	The user/individual on the job needs to know and understand how to: SB3. improve work processes by interacting with others and adopting best practices
	Critical thinking
	The user/individual on the job needs to know and understand how to: SB4. spot process disruptions and delays and report and communicate with solutions
	Problem Solving
	Not Applicable
	Customer Centricity
	Not Applicable

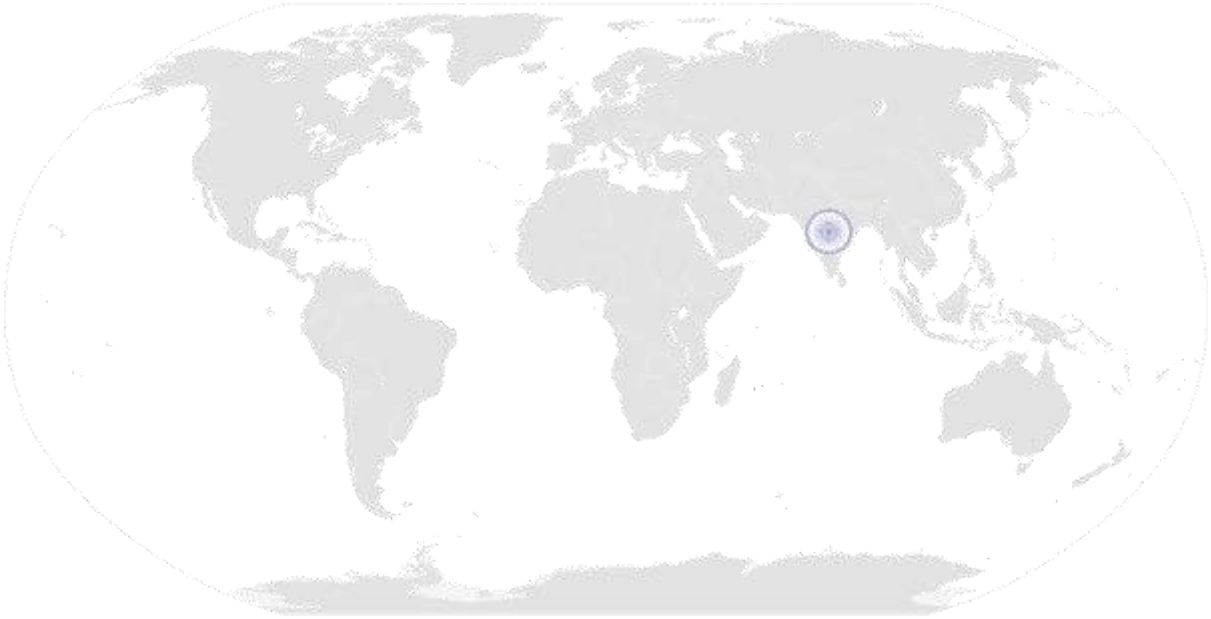
LFS/N0204 : Coordinate with Shift Supervisor, cross functional teams and within the team

NOS Version Control

NOS Code	LFS/N0204		
Credits(NSQF)	TBD	Version number	1.0
Industry	Life Sciences	Drafted on	23/06/14
Industry Sub-sector	Pharmaceuticals, Bio Pharmaceuticals	Last reviewed on	15/05/15
Occupation	Manufacturing	Next review date	01/06/16



National Occupational Standard



Overview

This Occupational Standard describes the knowledge, understanding and skills required of a Fitter to ensure healthy, safe and secure working environment in the life sciences facility.

National Occupational Standard

LFS/N0101 : Maintain a healthy, safe and secure working environment in the life sciences facility

Unit Code	LFS /N0101
Unit Title (Task)	Maintain a healthy, safe and secure working environment in the life sciences facility
Description	This NOS unit is about a Fitter monitoring the working environment and making sure that it meets the requirements for health, safety and security in the pharmaceutical/contract research/biopharmaceutical facility/ manufacturing/ testing/ analysis/ research laboratory.
Scope	This unit / task covers the following: **Ensuring healthy, safe and secure working environment:** • self monitor and adhere to safety principles and standards • ensure behavioural safety by workmen to cGMP and applicable safety standards on the shop floor/ laboratory • report any identified breaches in health, safety, and security policies and procedures to the designated person **Managing emergency procedures**: • illness • accidents • fires • other reasons to evacuate the premises • breaches of security

Performance Criteria (PC) wrt the Scope	
Element	**Performance Criteria**
Ensuring healthy, safe and secure working environment	To be competent, the user/individual on the job must be able to: PC1. observe and comply with the company's current health, safety and security policies and procedures PC2. while carrying out work, use appropriate safety gears like head gear, masks, gloves and other accessories as mentioned in the guidelines PC3. report any identified breaches in health, safety, and security policies and procedures to the designated person PC4. responsible for maintaining discipline at the shop-floor/ production area PC5. identify and correct any hazards that the individual can deal with safely, competently and within the limits of their authority PC6. adhere and comply to storage and handling guidelines for hazardous material PC7. identify and recommend opportunities for improving health, safety, and security to the designated person PC8. complete any health, safety and security activities like safety drills and prepare records legibly and accurately
Managing emergency procedures	PC9. report any hazards that the individual is not competent to deal with to the relevant person in line with organizational procedures and warn other people who may be affected PC10. follow the company's emergency procedures promptly, calmly, and efficiently

LFS/N0101 : Maintain a healthy, safe and secure working environment in the life sciences facility

Knowledge and Understanding (K)	
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	The user/ individual on the job needs to know and understand: KA1. legislative requirements and company's procedures for health, safety and security and individual's role and responsibilities in relation to this KA2. what is meant by a hazard, including the different types of health and safety hazards that can be found in the workplace KA3. how and when to report hazards KA4. limits of individual responsibility for dealing with hazards KA5. the organization's emergency procedures for different emergency situations and the importance of following these KA6. the importance of maintaining high standards of health, safety and security KA7. implications that any non-compliance with health, safety and security may have on individuals and the organization KA8. health hazards and its implications if any in the production process
B Technical Knowledge	The user/ individual on the job needs to know and understand: KB1. different types of breaches in health, safety and security and how and when to report these KB2. evacuation procedures for workers and visitors KB3. how to summon medical assistance and the emergency services, where necessary KB4. how to use the health, safety and accident reporting procedures and the importance of these KB5. different types of occupational health hazards KB6. knowledge of chemical substances, their characteristics and required precaution and safety measures
Skills (S)	
A. Core Skills/ Generic Skills	**Writing skills**
	The user/ individual on the job needs to know and understand how to: SA1. complete accurate, well written work with attention to detail
	Reading skills
	The user/ individual on the job needs to know and understand how to: SA2. read instructions, guidelines, procedures, rules and service level agreements
	Oral Communication (Listening and Speaking skills)
	The user/ individual on the job needs to know and understand how to:

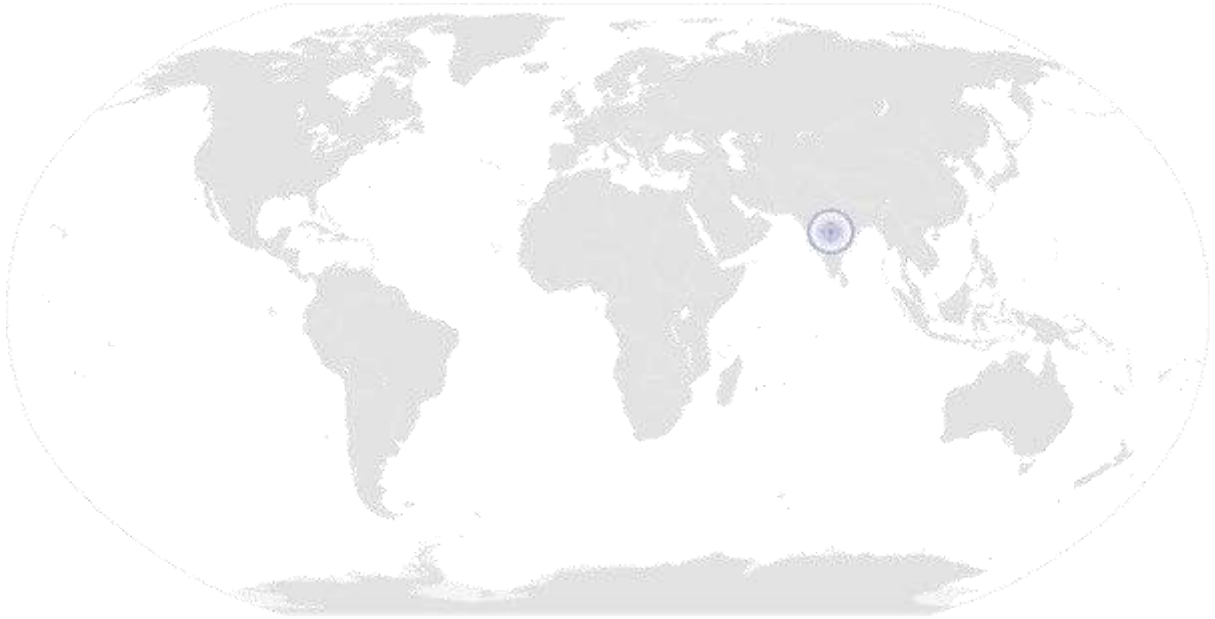
LFS/N0101 : Maintain a healthy, safe and secure working environment in the life sciences facility

	SA3. listen effectively and orally communicate information accurately
B. Professional Skills	**Decision making**
	The user/ individual on the job needs to know and understand how to: SB1. make decisions on suitable courses of action
	Plan and Organise
	The user/ individual on the job needs to know and understand how to: SB2. plan and organize work to meet health, safety and security requirements
	Problem solving
	The user/ individual on the job needs to know and understand how to: SB3. apply problem solving approaches in different situations
	Analytical thinking
	The user/ individual on the job needs to know and understand how to: SB4. analyse data and activities
	Critical thinking
	The user/ individual on the job needs to know and understand how to: SB5. apply balanced judgments to different situations
	Customer Centricity
	Not Applicable

LFS/N0101 : Maintain a healthy, safe and secure working environment in the life sciences facility

NOS Version Control

NOS Code	LFS /N0101		
Credits(NSQF)	TBD	Version number	1.0
Industry	Life Sciences	Drafted on	26/06/14
Industry Sub-sector	Pharmaceuticals, Bio Pharmaceuticals	Last reviewed on	15/05/15
Occupation	Manufacturing, Quality, Supply Chain, R&D	Next review date	01/06/16



Annexure

Nomenclature for QP and NOS

Qualifications Pack

9 characters

LFS / Q 0101

LFS

Q denoting Qualification Pack

QP Number (2 numbers)

Occupation (2 numbers)

Occupational Standard

An example of NOS with 'N'

9 characters

LFS / N 0101

LFS

N denoting National Occupational Standard

OS Number (2 numbers)

Occupation (2 numbers)

The following acronyms/codes have been used in the nomenclature above:

Sub-Sector	Range of Occupation Numbers
Pharmaceutical and Biopharmaceutical and Contract Research	01-10
Pharmaceutical	11-20
Biopharmaceutical	21-30
Contract Research	31-40

Sequence	Description	Example
Three letters	Industry name	LFS
Slash	/	/
Next letter	Whether **Q**P or **N**OS	Q/N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

Q Qualifications Pack For Fitter Mechanical – Life Sciences

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Fitter Mechanical – Life Sciences
Qualification Pack LFS/Q0213
Sector Skill Council Life Sciences Sector Skill Development Council

Guidelines for Assessment:

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create *unique question papers for theory part for each candidate at each examination/training center* (as per assessment criteria below)
4. Individual assessment agencies will create *unique evaluations for skill practical for every student at each examination/training center* based on this criteria
5. To pass the Qualification Pack , every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

				Marks Allocation	
Assessment Outcome	**Assessment Criteria of Outcomes**	**Total Marks (400)**	**Out Of**	**Theory**	**Skills Practical**
LFS/ N 0260 (Perform fitting and assembly operations on metal components)	PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work	100	3	1	2
	PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing broaching operations		4	1	3
	PC3. ensure work area is clean and safe from hazards		2	0	2
	PC4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition		2	0	2
	PC5. ensure that all machines and machine tools are secured at all times		2	0	2
	PC6. determine job requirement from job specification documents obtained from valid sources		3	0	3
	PC7. establish the procedures to complete the general machining, fitting or assembling operations		3	0	3

	PC8. obtain the appropriate equipment, parts and accessories for the general machining, fitting or assembling operation		2	0	2
	PC9. check that all measuring equipment is within calibration date		3	0	3
	PC10. prepare/determine suitable datums from which to mark out (eg. choosing a machine face or filing a flat face as a datum)		3	0	3
	PC11. apply a marking medium to enhance clarity of the marking out		3	0	3
	PC12. use an appropriate method of marking out (eg. direct marking using instruments, use of templates or tracing/transfer methods)		4	0	4
	PC13. use a range of marking out equipment (eg. rules, squares, scribers, vernier instruments)		3	0	3
	PC14. mark out a range of features		3	0	3
	PC15. cut and shape the materials to the required specification, using appropriate tools and techniques		6	2	4
	PC16. use a range of hand fitting methods for fitting operations		4	0	4
	PC17. Use a range of manually operated machines for performing machining operations		3	0	3
	PC18. use appropriate methods and techniques to assemble and secure the components and sub-assemblies in their correct positions		6	2	4
	PC19. drill, tap and ream locating holes as required to permanently locate components		4	0	4
	PC20. fasten components permanently using methods such as using engineered fasteners, applying adhesives, soldering and brazing		3	0	3
	PC21. produce mechanical assemblies as per job specifications		6	2	4

	PC22. dismantle mechanical assemblies without damage to components and/or subassemblies		4	0	4
	PC23. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		3	0	3
	PC24. keep the work area in a safe and tidy condition during and on completion of the manufacturing activities		2	0	2
	PC25. return all tools and equipment to the correct location on completion of the fitting activities support the customer remotely over the internet to test potential solutions		3	0	3
	PC26. perform the necessary checks for dimensional accuracy		5	1	4
	PC27. use the appropriate measuring equipment for checking activities		3	0	3
	PC28. produce components within all of the applying standards		5	1	4
	PC29. generate stage inspection reports		3	0	3
	Total		100	10	90
LFS/ N 0261 (Perform maintenance activities on mechanical equipment/ machinery)	PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work	100	3	1	2
	PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing fabrication and fitting operations		4	1	3
	PC3. work following laid down procedures and instructions		3	1	2
	PC4. ensure work area is clean and safe from hazards		2	0	2
	PC5. ensure that all tools, equipment, power tool cables,		2	0	2

	extension leads are in a safe and usable condition				
	PC6. follow all relevant setting up and operating specifications for the products or mechanical equipment being commissioned		3	1	2
	PC7. follow the defined procedures and set up the equipment correctly ensuring that all operating parameters are achieved		3	1	2
	PC8. obtain job specifications and requirements from valid sources and find out the fault		2	0	2
	PC9. obtain and interpret drawings, specifications, manufacturers' manuals and other documents needed in the maintenance process		3	1	2
	PC10. follow the procedure to be adopted to establish the background of the fault and the tools to be used		3	1	2
	PC11. evaluate various types of information available for fault diagnosis		3	0	3
	PC12. evaluate sensory information to assess likely faults eg. sound, visual		3	0	3
	PC13. collect evidence regarding the fault from the sources using a range of diagnostic equipment and techniques		3	0	3
	PC14. apply monitoring or testing procedures to help in the fault diagnosis using a range of test equipment		4	1	3
	PC15. relate previous reports/records of similar fault conditions		2	0	2
	PC16. evaluate the likely risk of running the equipment with the displayed fault, and the effects the fault could have on health and safety, and on the overall process or system		3	0	3
	PC17. carry out the maintenance activities in the specified		5	1	4

	sequence and in an agreed timescale				
	PC18. carry out maintenance activities on various equipment		4	0	4
	PC19. perform dismantling processes mechanical equipment using appropriate method or technique in order to replace defective components		4	0	4
	PC20. re-assemble the components using appropriate methods, and adjust them to meet the operating specification		5	1	4
	PC21. carry out servicing and maintenance techniques as applicable		5	1	4
	PC22. replace or refit basic hydraulic and pneumatic components		4	0	4
	PC23. identify requirements for welding, machining, electric or electronic repair and handover to the relevant personal after following due process		3	0	3
	PC24. conduct a trial run of the equipment at full power/speed/flow		3	0	3
	PC25. confirm that the produced component/process outcomes meet specifications		3	0	3
	PC26. monitor and record measurements and observations		3	0	3
	PC27. review and update maintenance procedures and plans		3	0	3
	PC28. deal with equipment malfunction and rectify faults during the breakdown servicing process as appropriate		4	1	3
	PC29. identify areas of improvements in the various maintenance services and implement the improvement activities agreed upon by the relevant authorities		3	0	3
	PC30. deal promptly and effectively with problems within their control, and seek help and		3	0	3

	guidance from the relevant people if they have problems that they cannot resolve to ensure zero idle time of machine/ equipment				
	PC31. leave the work area in a safe and tidy condition on completion of the manufacturing activities		2	0	2
	Total		100	12	88
LFS/N0204 (Coordinate with Shift Supervisor, cross functional teams and within the team)	PC1. understand the work output requirements	100	12	6	6
	PC2. understand the quality standards to be maintained		12	6	6
	PC3. proactively inform supervisor on issues requiring intervention		12	6	6
	PC4. comply with company policy and rule		13	6	7
	PC5. deliver quality work on time and report any anticipated reasons for delay		13	6	7
	PC6. be able to resolve conflicts		12	6	6
	PC7. multi-task relevant activities to align with team goals		12	6	6
	PC8. put team over individual goals		14	6	8
	Total		100	48	52
LFS/N0101 (Maintain a healthy, safe and secure working environment in the life sciences facility)	PC1. observe and comply with the company's current health, safety and security policies and procedures	100	10	5	5
	PC2. while carrying out work, use appropriate safety gears like head gear, masks, gloves and other accessories as mentioned in the guidelines		10	5	5
	PC3. report any identified breaches in health, safety, and security policies and procedures to the designated person		10	5	5
	PC4. responsible for maintaining discipline at the shop-floor/ production area		10	5	5
	PC5. identify and correct any hazards that the individual can deal with safely, competently and within the limits of their authority		10	5	5

	PC6. adhere and comply to storage and handling guidelines for hazardous material		10	5	5
	PC7. identify and recommend opportunities for improving health, safety, and security to the designated person		10	5	5
	PC8. complete any health, safety and security activities like safety drills and prepare records legibly and accurately		10	4	6
	PC9. report any hazards that the individual is not competent to deal with to the relevant person in line with organizational procedures and warn other people who may be affected		10	4	6
	PC10. follow the company's emergency procedures promptly, calmly, and efficiently		10	5	5
	Total		100	48	52