

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

NSDA Reference

To be added by NSDA

Fitter

CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

Directorate General of Training (DGT)
Government of India, Ministry of Skill Development and Entrepreneurship,
Shram Shakti Bhavan, Rafi Marg
New Delhi-110001

Name and address of submitting body:

Directorate General of Training (DGT)
Government of India, Ministry of Skill Development and Entrepreneurship,
Shram Shakti Bhavan, Rafi Marg
New Delhi-110001

Name and contact details of individual dealing with the submission

Name: Shri Deepankar Mallick

Position in the organisation: Deputy Director General (T)

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List of documents submitted in support of the Qualifications File

1. Competency-based curriculum (Annexure 1)
2. Advertisements of different organisations for posts relevant to NTC in the trade
3. Placement figures of few ITIs

SUMMARY

Qualification Title	'Fitter'		
Qualification Code	N/A		
Nature and purpose of the qualification	National Trade Certificate; to train the 10 th class pass students in 'Fitter' trade and thus changing a non-worker to worker		
Body/bodies which will award the qualification	National Council for Vocational Training (NCVT)		
Body which will accredit providers to offer courses leading to the qualification	National Council for Vocational Training (NCVT) affiliates the ITIs on the basis of accreditation by Quality Council of India (QCI).		
Body/bodies which will carry out assessment of learners	National Council for Vocational Training (NCVT)		
Occupation(s) to which the qualification gives access	Fitters have a wide scope of Employability ranging from self-employment, contractual employment to Industrial jobs. On successful completion of this course, the candidates shall be gainfully employed in the following industries: • Production & Manufacturing industries. • Structural Fabrication like bridges, Roof structures, Building & construction. • Automobile and allied industries • Service industries like road transportation and Railways. • Ship building and repair • Infrastructure and defence organizations • In public sector industries like BHEL, BEML, NTPC, etc and private industries in India & abroad. • Self employment		
Licensing requirements	N/A		
Level of the qualification in the NSQF	Level 5		
Anticipated volume of training/learning required to complete the qualification	S. No.	Course Element	Notional Training Hours
	1	Professional Skill (Trade Practical)	2209
	2	Professional Knowledge (Trade Theory)	510
	3	Workshop Calculation & Science	170
	4	Engineering Drawing	255
	5	Employability Skills	110
	6	Library & Extracurricular activities	146
	7	Project work	240
	8	Revision & Examination	520
		Total	4160*
The major change is the addition of revision component approximately 360 hours, hence there is increase in the total no of notional hours.			

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Entry requirements and/or recommendations	Passed 10th Class with Science and Mathematics under 10+2 system of Education or its equivalent		
Progression from the qualification	• Can appear in 10+2 examination through National Institute of Open Schooling (NIOS) for acquiring higher secondary certificate and can go further for General/ Technical education • Can take admission in diploma course in notified branches of Engineering by lateral entry • Can join as semi-skilled worker in the industry and can become supervisor after doing part-time diploma in relevant branch of Engineering • Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC) after which they will be employed in industry as skilled worker and can become supervisor after doing part-time diploma in relevant branch of Engineering • Can join Crafts Instructor Training Scheme (CITS) in the relevant trade after which they will be employed in ITI/ Vocational Training Institute as instructor		
Planned arrangements for the Recognition of Prior learning (RPL)	1. At present the students who have passed 10th class with minimum 3 years' experience in relevant field can appear for NCVT theory and practical semester examination directly. 2. The students who have passed SCVT examination in 'Fitter' trade can also appear for the NCVT Examination in the relevant semester and Trade directly.		
International comparability where known	1. Existence of any official document suggesting the comparability of the qualification with the qualifications in other countries is not known. 2. However, ITI passed out trainees are getting employment in many Gulf countries, European countries, Australia, New Zealand, Singapore etc.		
Date of planned review of the qualification.	January 2020		
Formal structure of the qualification			
Title of component and identification code.	Mandatory/ Optional	Estimated size (learning hours)	Level

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Semester – I				
(i)	Plan and organize the work to make job as per specification applying different types of basic fitting operation and Check for dimensional accuracy. [Basic fitting operation – marking, Hacksawing, Chiseling, Filing, Drilling, Taping and Grinding etc. Accuracy: ± 0.25mm]	Mandatory	355	5
(ii)	Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting.	Mandatory	170	4
(iii)	Join metal component by arc welding observing standard procedure.	Mandatory	60	4
(iv)	Cut and join metal component by gas (oxy-acetylene)	Mandatory	60	4
(v)	Join metal components by riveting observing standard procedure.	Mandatory	60	4
Semester – II				
(vi)	Produce components by different operations and check accuracy using appropriate measuring instruments.[Different Operations - Drilling, Reaming, Taping, Dieing; Appropriate Measuring Instrument – Vernier, Screw Gauge, Micrometer]	Mandatory	200	5
(vii)	Make different fit of components for assembling as per required tolerance observing principle of interchangeability and check for functionality. [Different Fit – Sliding, Angular, Step fit, ‘T’ fit, Square fit and Profile fit; Required tolerance: ±0.04 mm, angular tolerance: 30 min.]	Mandatory	230	4
(viii)	Produce components involving different operations on lathe observing standard procedure and check for accuracy. [Different Operations – facing, plain turning, step turning, parting, chamfering, shoulder turn, grooving, knurling, boring, taper turning, threading (external ‘V’ only)]	Mandatory	170	4
(ix)	Plan & perform simple repair, overhauling of different machines and check for functionality. [Different Machines – Drill Machine, Power Saw, Bench Grinder and Lathe]	Mandatory	110	4
Semester – III				
(x)	Make & assemble components of different mating surfaces as per required tolerance	Mandatory	420	5

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

	by different surface finishing operations using different fastening components, tools and check functionality. [Different Mating Surfaces – Dovetail fitting, Radius fitting, Combined fitting; Different surface finishing operations – Scraping, Lapping and Honing; Different fastening components – Dowel pins, screws, bolts, keys and cotters; Different fastening tools- hand operated & power tools, Required tolerance - $\pm 0.02\text{mm}$, angular tolerance ± 10 min.]			
(xi)	Make different gauges by using standard tools & equipment and checks for specified accuracy. [Different Gauges – Snap gauge, Gap gauge; Specified Accuracy - $\pm 0.02\text{mm}$]	Mandatory	170	5
(xii)	Apply a range of skills to execute pipe joints, dismantle and assemble valves & fittings with pipes and test for leakages.[Range of skills – Cutting, Threading, Flaring, Bending and Joining]	Mandatory	110	5
Semester – IV				
(xiii)	Make drill jig & produce components on drill machine by using jigs and check for correctness.	Mandatory	60	4
(xiv)	Identify, dismantle, replace and assemble different pneumatics and hydraulics components. [Different components – Compressor, Pressure Gauge, Filter Regulator Lubricator, Valves and Actuators.]	Mandatory	62	4
(xv)	Construct circuit of pneumatics and hydraulics observing standard operating procedure& safety aspect.	Mandatory	60	5
(xvi)	Plan, dismantle, repair and assemble different damaged mechanical components used for power transmission & check functionality. [Different Damage Mechanical Components – Pulley, Gear, Keys, Jibs and Shafts.]	Mandatory	279	5
(xvii)	Plan, erect simple machine and test machine tool accuracy. [Simple Machines – Drill Machine, Power Saw and Lathe]	Mandatory	93	5
Generic Learning Outcomes				
(xviii)	Recognize & comply safe working practices, environment regulation and housekeeping.	Mandatory	10	4
(xix)	Understand and explain different	Mandatory	170	5

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

	mathematical calculation & science in the field of study including basic electrical. [Different mathematical calculation & science -Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, Levers & Simple machine, graph, Statistics, Centre of gravity, Power transmission, Pressure]			
(xx)	Interpret specifications, different engineering drawing and apply for different application in the field of work. [Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol]	Mandatory	255	5
(xxi)	Select and ascertain measuring instrument and measure dimension of components and record data.	Mandatory	20	4
(xxii)	Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	Mandatory	25	5
(xxiii)	Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	Mandatory	15	4
(xxiv)	Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	Mandatory	55	5
(xxv)	Plan and organize the work related to the occupation	Mandatory	35	5

Please attach any document giving further detail about the structure of the qualification – eg a Curriculum Document or a Qualification Pack.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

SECTION 1
ASSESSMENT**Body/Bodies which will carry out assessment:**

National Council for Vocational Training (NCVT)

How will RPL assessment be managed and who will carry it out?

1. At present the students who have passed 10th class with minimum 3 years' experience can appear for NCVT theory and practical semester examination directly.
2. The students who have passed SCVT examination in 'Fitter' trade can also appear for the NCVT Examination in the relevant semester and Trade directly. NCVT will carry out the assessment and State Directorates advertise in newspapers for informing the prospective candidates.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.

(1) Assessment process:

The assessment for the semester-based qualification is carried out by conducting formative assessments, and end-of-semester examinations. The internal assessments for theory subjects and practical are conducted by the concerned instructors for evaluating the knowledge and skill acquired by trainees and the behavioural transformation of the trainees. This internal assessment is primarily carried out by collecting evidence of competence gained by the trainees by evaluating them at work based on assessment criteria, asking questions and initiating formative discussions to assess understanding and by evaluating records and reports, and sessional marks are awarded to them. Theory and practical examinations are conducted in Trade theory, Workshop Calculation & Science, Engineering Drawing and Employability Skills. The question papers for the theory Examinations contain objective type questions. Trade practical examinations are conducted by the respective State Governments. However, the question papers for the Trade practical are prepared by NCVT.

The marking pattern and distribution of marks for the qualification are as under:

Marking Pattern		
Sl. No.	Subject for the trade test	Maximum marks for the each subject
a)	Practical	300
b)	Trade Theory	200
c)	Employability Skills	Objective type Written test of 200 marks (Trade Theory 150 marks & Employability Skills 50 marks)
d)	Work shop Calculation and Science.	100
e)	Engineering Drawing	Objective Type Written test of 100 marks (Engineering Drawing 50 marks & Work shop Calculation and Science 50 marks)

f)	Internal assessment	100
TOTAL:		700

(2) Minimum pass marks:

40% for each Theory Examination and 25% for each part/section of the Examination separately, and 60% marks for each Trade practical Examination.

(3) Testing and certifications for the course:

- OMR sheet based question paper.
- A panel of expert paper setters, who are graduates in the concerned field with minimum 5-7 years experience, is prepared for setting question papers for the Trade. The panel is vetted by the Member Secretary, NCVT.
- Paper setters are appointed from the panel after the approval of the competent authority for setting the question paper.
- The question papers are then moderated by the Board of Moderation to see if the paper is set as per the requirement and syllabus.
- The manuscripts of the moderated question papers are sent to Government Printing Presses for printing.
- Printed question papers, packed in sealed covers, are despatched to Banks/Police Stations for keeping in safe custody.
- The question papers are handed over to the Chairman/Principal of the Testing Centre two hours before the commencement of the Examination.
- An Examination Board consisting of representatives of industry/Employer/State Government are set up to supervise and monitor the conduct of Examinations at every Centre.
- Theory and practical Examinations are carried out with invigilators/examiners with the overall supervision of the Examination Board.
- Examiners called for evaluation of practical should have minimum technical qualification of a Diploma in the respective engineering field. However, when diploma holders not available, the qualification is suitably relaxed.
- Examiners for practical Examinations are appointed preferably from Polytechnics/ Engineering colleges/ Industry of repute/ Government Departments or from amongst retired qualified personnel possessing requisite qualifications and sufficient experience in the trade/discipline.
- Each State Directorate prepares a panel of Examiners according to the norms as mentioned above and the Examiners are appointed from the panel.
- Flying squads from State Governments as well as the Central Government are constituted to check malpractices during the conduct of Examinations.
- OMR based answer sheets are evaluated by the third party evaluator only. Third party evaluator is selected for three years by open bidding process.
- Evaluation of every practical examination is carried out by the concerned examiner (from industry/ polytechnics) with the overall supervision of the Examination Board in a free and fair manner as per the assessment criteria.
- Till 2014, the marks were compiled by the State Governments as per NCVT guidelines and the results were declared by the State Governments. At present, the marks are compiled by NCVT on its portal www.ncvtmis.gov.in and the results are declared by the State Governments.
- The successful trainees are awarded National Trade Certificates.

Overall assessment strategy:

Assessment of the qualification evaluates trainees to show that they can integrate knowledge, skills and values for carrying out relevant tasks as per the defined assessable outcomes and assessment criteria. The trainees may choose the preferred language for assessment. The underlying principle of assessment is fairness and transparency. While assessing the trainee, assessor is directed to assess as per the defined assessment criteria against the assessable outcomes. The evidence of the competence acquired by the trainees can be obtained by conducting theory and practical examinations, observing the trainees at work, asking questions and initiating formative discussions to assess understanding and evaluating records and reports. The ultimate objective of the assessment is to assess the candidates as per the defined assessment criteria for the assessable/ learning outcomes.

Specific Arrangements for assessment:

- Assessment is outcome-based.
- There are formative and summative assessments in Theory and Practical.
- Assessment is carried out in Trade theory, Trade Practical, Workshop Calculation and Science, Engineering Drawing and Employability Skills.
- While Trade Theory and Trade Practical are used for assessing Trade-related jobs, Workshop Calculation and Science is used to test trainee's numerical skills, Drawing is used to test the ability of the trainee to draw and read sketches and Employability skills is used to test the communication and language skills of the trainee.
- In addition to demonstration of theory and practical knowledge, trainees get a chance to present total personality.

Quality assurance activities:

- Question papers are set by external paper setters
- Evaluation of Theory Examinations is done by third-party agency. Third party evaluator is selected for three years by open bidding process.
- Trade Practical is examined by External Examiner (as explained above).

Please attach any documents giving further information about assessment and/or RPL.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

ASSESSMENT EVIDENCE

Complete a grid for each component as listed in "Formal structure of the the qualification" in the Summary.

NOTE: this grid can be replaced by any part of the qualification documentation which shows the same information – ie Learning Outcomes to be assessed, assessment criteria and the means of assessment.

Title of Component: Fitter

Specific Assessable Outcomes:

SPECIFIC LEARNING / ASSESSABLE OUTCOME		
SEMESTER-I		
LEARNING / ASSESSABLE OUTCOME	ASSESSMENT CRITERIA	MARKS
1. Plan and organize the work to make job as per specification applying different types of basic fitting operation and Check for dimensional accuracy. <i>[Basic fitting operation – marking, Hacksawing, Chiseling, Filing, Drilling, Taping and Grinding etc. Accuracy: $\pm 0.25\text{mm}$]</i>	1. 1 Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.	Practical: 17 Theory: 8 Total: 25
	1. 2 Select raw material and visual inspect for defects.	
	1. 3 Mark as per specification applying desired mathematical calculation and observing standard procedure.	
	1. 4 Measure all dimensions in accordance with standard specifications and tolerances.	
	1. 5 Identify Hand Tools for different fitting operations and make these available for use in a timely manner.	
	1. 6 Prepare the job for Hacksawing, chiselling, filing, drilling, tapping, grinding.	
	1. 7 Perform basic fitting operations viz., Hacksawing, filing, drilling, tapping and grinding to close tolerance as per specification to make the job.	
	1. 8 Observe safety procedure during above operation as per standard norms and company guidelines.	
	1. 9 Check for dimensional accuracy as per standard procedure.	
	1. 10 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.	
2. Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting.	2. 1 Identify Hand Tools for Sheet Metal work, Soldering, Brazing & riveting and make these available for use in a timely manner.	Practical: 17 Theory: 8 Total: 25
	2. 2 Mark and develop various forms as per drawing using sheet metals.	
	2. 3 make of simple items with sheet metal as per drawing.	
	2. 4 Prepare the job for Soldering, Brazing & riveting.	
	2. 5 Identify different type of rivets and use as per requirement.	
	2. 6 Identify tools for drilling and use these tools.	
	2. 7 Mark according to drawing.	
	2. 8 Drill through holes on the job.	
	2. 9 Solder, Braze and Rivet to prepare a job as per given drawing / sample following standard practices.	
	2. 10 Observe safety procedure during riveting as per standard norms and company guidelines.	
3. Join metal components by riveting observing standard procedure.	3. 1 Identify Tools and equipments for riveting and make these available for use in a timely manner.	Practical: 17 Theory: 8 Total: 25
	3. 2 Prepare the job for lap and butt joint.	
	3. 3 Identify different type of rivets and use as per requirement.	
	3. 4 Identify tools for drilling and use these tools.	
	3. 5 Mark according to drawing.	
	3. 6 Drill through holes on the job.	

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

	3. 7 Rivet to prepare a job as per given drawing / sample following standard practices.	
	3. 8 Observe safety procedure during riveting as per standard norms and company guidelines.	
4. Join metal component by arc welding observing standard procedure.	4. 1 Identify different components/parts of arc welding machine, collect desired information and set each components/parts as per standard procedure.	Practical: 17 Theory: 8 Total: 25
	4. 2 Observe safety/ precaution during operation.	
	4. 3 Select appropriate material & plan for arc welding.	
	4. 4 Weld metal parts / mechanical components as per specification observing standard procedure.	
	4. 5 Check joined part portion to ascertain proper welding.	
5. Cut and join metal component by gas (oxy-acetylene)	5. 1 Identify different components/parts of Gas (oxy-acetylene) machine, collect desired information and set each components/parts as per standard procedure.	Practical: 17 Theory: 8 Total: 25
	5. 2 Observe safety/ precaution during operation.	
	5. 3 Select appropriate material & plan for gas cutting & joining operation.	
	5. 4 Cut & join metal parts / mechanical components as per specification observing standard procedure.	
	5. 5 Check cut portion/ joined part to ascertain proper welding.	

SEMESTER-II

LEARNING / ASSESSABLE OUTCOME	ASSESSMENT CRITERIA	MARKS
6. Produce components by different operations and check accuracy using appropriate measuring instruments. <i>[Different Operations - Drilling, Reaming, Taping, Dieing; Appropriate Measuring Instrument – Vernier, Screw Gauge, Micrometer]</i>	6. 1 Ascertain and select tools and materials for the job and make this available for use in a timely manner.	Practical: 17 Theory: 8 Total: 25
	6. 2 Plan work in compliance with standard safety norms.	
	6. 3 Produce component by observing standard procedure.	
	6. 4 Check the dimensions of the produced components to ensure dimensions are within prescribed limit.	
	6. 5 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.	
7. Make different fit of components for assembling as per required tolerance observing principle of interchangeability and check for functionality. <i>[Different Fit – Sliding, Angular, Step fit, 'T' fit, Square fit and Profile fit; Required tolerance: ± 0.04 mm,</i>	7. 1 Recognize general concept of Limits, Fits and tolerance necessary for fitting applications and functional application of these parameters.	Practical: 17 Theory: 8 Total: 25
	7. 2 Ascertain and select tools and materials for the job and make this available for use in a timely manner.	
	7. 3 Set up workplace/ assembly location with due consideration to operational stipulation	
	7. 4 Plan work in compliance with standard safety norms and collecting desired information.	
	7. 5 Demonstrate possible solutions and agree tasks within the team.	
	7. 6 Make components according to the specification for different fit using a range of practical skills and ensuring interchangeability of different parts.	

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

<i>angular tolerance: 30 min.]</i>	7. 7	Assemble components applying a range of skills to ensure proper fit.	
	7. 8	Check functionality of components.	
8. Produce components involving different operations on lathe observing standard procedure and check for accuracy. <i>[Different Operations – facing, plain turning, step turning, parting, chamfering, shoulder turn, grooving, knurling, boring, taper turning, threading (external 'V' only)]</i>	8. 1	Ascertain basic working principles and safety aspect of lathe machine.	Practical: 17 Theory: 8 Total: 25
	8. 2	Understand functional application of different levers, stoppers, adjustment etc.	
	8. 3	Identify different lubrication points and lubricants, their usage for application in lathe machine as per machine manual.	
	8. 4	Identify different work and tool holding devices and collect information for functional application of each device.	
	8. 5	Mount the work and tool holding devices with required alignment and check for its functional usage to perform lathe operations.	
	8. 6	Solve problem by applying basic methods, tools, materials and information during setting.	
	8. 7	Observe safety procedure during mounting as per standard norms.	
	8. 8	Produce components observing standard procedure.	
	8. 9	Check accuracy/ correctness of job using appropriate equipment/gauge.	
	8. 10	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.	
9. Plan & perform simple repair, overhauling of different machines and check for functionality. <i>[Different Machines – Drill Machine, Power Saw, Bench Grinder and Lathe]</i>	9. 1	Ascertain and select tools and materials for the repair, overhauling and make this available for use in a timely manner.	Practical: 17 Theory: 8 Total: 25
	9. 2	Plan work in compliance with standard safety norms.	
	9. 3	Demonstrate possible solutions and agree tasks within the team.	
	9. 4	Select specific parts to be repaired and ascertain for appropriate material and estimated time.	
	9. 5	Repair, overhaul and assemble the parts in the machine with the help of blue print.	
	9. 6	Check for functionality of part and ascertain faults of the part/ machine in case of improper function.	
	9. 7	Rectify faults of assembly.	
SEMESTER-III			
LEARNING / ASSESSABLE OUTCOME	ASSESSMENT CRITERIA		
10. Make & assemble components of different mating surfaces as per required tolerance by different surface finishing operations using different	10. 1	Ascertain and select tools and materials for the job and make this available for use in a timely manner.	Practical: 17 Theory: 8 Total: 25
	10. 2	Plan work in compliance with standard and collecting necessary information.	
	10. 3	Set up workplace/ assembly location with due consideration to operational stipulation	
	10. 4	Demonstrate possible solutions and agree tasks within the team.	

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

fastening components, tools and check functionality. [Different Mating Surfaces – Dovetail fitting, Radius fitting, Combined fitting; Different surface finishing operations – Scraping, Lapping and Honing; Different fastening components – Dowel pins, screws, bolts, keys and cotter; Different fastening tools-hand operated & power tools, Required tolerance - ±0.02mm, angular tolerance ± 10 min.]	10. 5 Produce different components with appropriate accuracy by observing standard procedure& method as per specification using appropriate tools & machines.	
	10. 6 Perform scraping and lapping of components to obtain required surface finish of different mating surface.	
	10. 7 Comply with safety rules when performing the above operations.	
	10. 8 Check tolerance and accuracy of components as defined with appropriate instruments observing standard procedure.	
	10. 9 Assemble different components using different fastening components, tools and check the functionality.	
11. Make different gauges by using standard tools & equipment and checks for specified accuracy. [Different Gauges – Snap gauge, Gap gauge; Specified Accuracy - ±0.02mm]	11. 1 Ascertain and select tools and materials for the job and make this available for use in a timely manner.	Practical: 17 Theory: 8 Total: 25
	11. 2 Plan work in compliance with standard safety norms.	
	11. 3 Produce gauge by observing appropriate method and as per specification of drawing.	
	11. 4 Perform Lapping of gauge to obtain required finish as per drawing.	
	11. 5 Check tolerance and specified accuracy of gauge with appropriate measuring instruments as per drawing.	
	11. 6 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.	
12. Apply a range of skills to execute pipe joints, dismantle and assemble valves & fittings with pipes and test for leakages. [Range of skills – Cutting, Threading, Flaring, Bending and Joining]	12.1 Ascertain and select tools and materials for the job and make this available for use in a timely manner.	Practical: 17 Theory: 8 Total: 25
	12.2 Plan to Dismantle and assemble valves and pipe fittings.	
	12.3 Dismantle valves and fittings in pipes applying range of skills and check for defect as per standard procedure.	
	12.4 Demonstrate possible solutions in case of defect and agree tasks within the team for repair or replacement.	
	12.5 Assemble valves and various pipe fittings using range of skills and observing standard procedure.	
	12.6 Test for leakage and appropriate functioning of valves.	
	12.7 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.	

SEMESTER-IV

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

LEARNING / ASSESSABLE OUTCOME	ASSESSMENT CRITERIA	
13. Make drill jig & produce components on drill machine by using jigs and check for correctness.	13.1 Set up workplace/ assembly location with due consideration to operational stipulation.	Practical: 16 Theory: 9 Total:25
	13.2 Ascertain and select tools and materials for the job and make this available for use in a timely manner.	
	13.3 Collect information related to standard procedure, methods and tools to make drill jigs.	
	13.4 Mark the components as per drawing.	
	13.5 Make drill jigs by turning, drilling, reaming, filing, tapping, etc.	
	13.6 Test the functionality of jig.	
	13.7 Select suitable jigs for drilling considering desired result and collecting necessary information.	
	13.8 Produce component by using jig observing standard procedure and check the correctness of the job.	
	13.9 Comply with safety rules when performing the above operations.	
14. Plan, dismantle, repair and assemble different damaged mechanical components used for power transmission & check functionality. <i>[Different Damage Mechanical Components – Pulley, Gear, Keys, Jibs and Shafts.]</i>	14.1 Select and ascertain tools and materials for the job and make this available for use in a timely manner.	Practical: 16 Theory: 9 Total:25
	14.2 Plan to dismantle, repair and assemble mechanical components used for power transmission as per drawing and collecting necessary information.	
	14.3 Perform dismantling and appropriate repairing of mechanical components with accuracy applying range of skills and appropriate repairing processes.	
	14.4 Check the accuracy of the repaired components with appropriate gauge & instruments.	
	14.5 Assemble the repaired mechanical components observing standard procedure.	
	14.6 Comply with safety rules when performing the above operations.	
	14.7 Check different parameters of power transmission e.g. R.P.M, slackness of belts, matching of gears/ clutches, loss of RPM etc.	
	14.8 Check for functionality of power transmission system or any assembly as per standard parameters.	
15. Identify, dismantle, replace and assemble different pneumatics and hydraulics components. <i>[Different components – Compressor, Pressure Gauge, Filter Regulator Lubricator, Valves and Actuators.]</i>	15.1 Select and ascertain tools for the job and make this available for use in a timely manner.	Practical: 16 Theory: 9 Total:25
	15.2 Identify different pneumatics and hydraulics components.	
	15.3 Plan to dismantle and replace pneumatics & hydraulics circuit as per drawing and collecting necessary information.	
	15.4 Perform dismantling and replacing of different components with accuracy applying range of skills and standard operating procedure.	
	15.5 Assemble different components.	
	15.6 Check functionality of the components.	
16. Construct circuit of pneumatics and hydraulics observing standard operating procedure& safety aspect.	16.1 Select and ascertain tools for the job and make this available for use in a timely manner.	Practical: 16 Theory: 9 Total:25
	16.2 Plan to construct pneumatics & hydraulics circuit as per drawing and collecting necessary information.	
	16.3 Demonstrate possible solutions and agree tasks within the team for constructing circuit.	
	16.4 Construct circuit of pneumatics and hydraulics observing	

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

	standard procedure.	
	16.5 Comply with safety rules when performing the above operations.	
	16.6 Check different parameters and functionality of the system.	
17. Plan & perform basic day to day preventive maintenance, repairing and check functionality. <i>[Simple Machines – Drill Machine, Power Saw and Lathe]</i>	17.1 Ascertain preventive maintenance/repair procedure as per manual of machine and select appropriate tools & equipment for undertaking job.	Practical: 16 Theory: 9 Total:25
	17.2 Interpret construction, alignment and assembly of different parts of machine.	
	17.3 Plan to carry out the preventive maintenance/repair task with appropriate accuracy of simple machine by collecting necessary information.	
	17.4 Demonstrate possible solutions and agree tasks within the team.	
	17.5 Perform preventive maintenance/dismantle, repair parts and assemble sub-assemblies of simple machine as per layout plan and standard procedure.	
	17.6 Put the machine in operation complying Standard operating procedure.	
	17.7 Check for proper functioning of repaired machine and other parameters of simple machine as per manual after erection.	
	17.8 Dispose unsalvageable materials as per standard procedures.	
18. Plan, erect simple machine and test machine tool accuracy. <i>[Simple Machines – Drill Machine, Power Saw and Lathe]</i>	18.1 Ascertain erection procedure as per manual of machine and select appropriate tools & equipment for undertaking job.	Practical: 16 Theory: 9 Total:25
	18.2 Interpret construction, alignment and assembly of different parts of machine.	
	18.3 Set up workplace/ assembly location with due consideration to operational stipulation	
	18.4 Plan to carry out the erection of simple machine by collecting necessary information.	
	18.5 Demonstrate possible solutions and agree tasks within the team.	
	18.6 Erect simple machine as per layout plan and standard procedure.	
	18.7 Put the machine in operation complying Standard operating procedure.	
	18.8 Check alignment of erected machine and other parameters of simple machine as per manual after erection.	
	18.9 Dispose unsalvageable materials as per standard procedures.	
GRAND TOTAL		Practical: 300 Theory: 150 Total: 450

Generic Assessable Outcome:

GENERIC LEARNING / ASSESSABLE OUTCOME		
SEMESTER-I		
LEARNING / ASSESSABLE OUTCOME	LEARNING / ASSESSABLE OUTCOME	MARKS
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1. 1. Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.	Practical: 15 Theory: 10 Total: 25
	1. 2. Recognize and report all unsafe situations according to site policy.	
	1. 3. Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.	
	1. 4. Identify, handle and store / dispose off dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.	
	1. 5. Identify and observe site policies and procedures in regard to illness or accident.	
	1. 6. Identify safety alarms accurately.	
	1. 7. Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.	
	1. 8. Identify and observe site evacuation procedures according to site policy.	
	1. 9. Identify Personal Productive Equipment (PPE) and use the same as per related working environment.	
	1. 10. Identify basic first aid and use them under different circumstances.	
	1. 11. Identify different fire extinguisher and use the same as per requirement.	
	1. 12. Identify environmental pollution & contribute to avoidance of same.	
	1. 13. Take opportunities to use energy and materials in an environmentally friendly manner	
	1. 14. Avoid waste and dispose waste as per procedure	
	1. 15. Recognize different components of 5S and apply the same in the working environment.	
2. Understand, explain different mathematical calculation & science in the field of study including basic electrical and apply in day to day	2.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction.	Practical: 15 Theory: 10 Total: 25
	2.2 Measure dimensions as per drawing	
	2.3 Use scale/ tapes to measure for fitting to specification.	
	2.4 Comply given tolerance.	
	2.5 Prepare list of appropriate materials by interpreting	

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

work. <i>[Different mathematical calculation & science -Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, Levers & Simple machine, graph, Statistics, Centre of gravity, Power transmission, Pressure]</i>	detail drawings and determine quantities of such materials.	
	2.6 Ensure dimensional accuracy of assembly by using different instruments/gauges.	
	2.7 Explain basic electricity, insulation & earthing.	
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. <i>[Different engineering drawing- Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol]</i>	3. 1. Read & interpret the information on drawings and apply in executing practical work.	Practical: 15 Theory: 10 Total: 25
	3. 2. Read & analyse the specification to ascertain the material requirement, tools, and machining /assembly /maintenance parameters.	
	3. 3. Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.	
4. Select and ascertain measuring instrument and measure dimension of	4.1 Select appropriate measuring instruments such as micrometers, vernier calipers, dial gauge, bevel protector and height gauge (as per tool list).	Practical: 15 Theory: 10 Total: 25
	4.2 Ascertain the functionality & correctness of the instrument.	

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

components and record data.	4.3 Measure dimension of the components & record data to analyse the with given drawing/measurement.	
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	5.1 Explain the concept of productivity and quality tools and apply during execution of job.	Practical: 15 Theory: 10 Total: 25
	5.2 Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.	
	5.3 Knows benefits guaranteed under various acts	
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain sensitive to avoid environment pollution.	
	6.2 Dispose waste following standard procedure.	
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	7. 1. Explain personnel finance and entrepreneurship.	Practical: 15 Theory: 10 Total: 25
	7. 2. Explain role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.	
	7. 3. Prepare Project report to become an entrepreneur for submission to financial institutions.	
8. Plan and organize the work related to the occupation.	8. 1. Use documents, drawings and recognize hazards in the work site.	Practical: 15 Theory: 10 Total: 25
	8. 2. Plan workplace/ assembly location with due consideration to operational stipulation	
	8. 3. Communicate effectively with others and plan project tasks	
GRAND TOTAL		Practical: 120 Theory: 80 Total: 200

Means of assessment 1

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

Means of assessment 2**Pass/Fail**

The minimum pass percentage is 40% for each Theory Examination and 25% for each part/section of the Examination separately, and 60% marks for each Trade practical Examination.

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

SECTION 2

EVIDENCE OF LEVEL

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

OPTION A

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
Process	Requires Well Developed Skill - Plan and organize the work to make job as per specification applying different types of basic fitting operation and Check for dimensional accuracy. [Basic fitting operation – marking, Hacksawing, Chiseling, Filing, Drilling, Taping and Grinding etc. Accuracy: $\pm 0.25\text{mm}$] - Make & assemble components of different mating surfaces as per required tolerance by different surface finishing operations using different fastening components, tools and check functionality. [Different Mating Surfaces – Dovetail fitting, Radius fitting, Combined fitting; Different surface finishing operations – Scraping, Lapping and Honing; Different fastening components – Dowel pins, screws, bolts, keys and cotters; Different fastening tools-hand operated & power tools, Required tolerance - $\pm 0.02\text{mm}$, angular tolerance ± 10 min.] - Make different gauges by using standard tools & equipment and checks for specified accuracy. [Different Gauges – Snap gauge, Gap gauge; Specified Accuracy - $\pm 0.02\text{mm}$]	The learner requires to demonstrate a well-developed skill for example measurement as per required accuracy, make different gauges and fitting as indicated in the learning outcomes to achieve the tolerance levels and accuracy demanded as per the job.	5

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	- Construct circuit of pneumatics and hydraulics observing standard operating procedure & safety aspect. - Plan, dismantle, repair and assemble different damaged mechanical components used for power transmission & check functionality. [Different Damage Mechanical Components – Pulley, Gear, Keys, Jibs and Shafts.] Clear choice of procedures in familiar context - Plan and organize the work to make job as per specification applying different types of basic fitting operation and Check for dimensional accuracy. [Basic fitting operation – marking, Hacksawing, Chiseling, Filing, Drilling, Taping and Grinding etc. Accuracy: $\pm 0.25\text{mm}$] - Produce components by different operations and check accuracy using appropriate measuring instruments. [Different Operations - Drilling, Reaming, Taping, Dieing; Appropriate Measuring Instrument – Vernier, Screw Gauge, Micrometer] - Make & assemble components of different mating surfaces as per required tolerance by different surface finishing operations using different fastening components, tools and check	The learner requires to apply clear choice of procedures in familiar context as indicated in the learning outcomes. In all these learning outcomes the learner has to apply ones knowledge and decide what needs to be done to either meet the client's requirement or identify a fault and decide how to rectify it or plan as per requirements and resources available. Hence NSQF Level is 5 for this descriptor	

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	functionality. [Different Mating Surfaces – Dovetail fitting, Radius fitting, Combined fitting; Different surface finishing operations – Scraping, Lapping and Honing; Different fastening components – Dowel pins, screws, bolts, keys and cotter pins; Different fastening tools-hand operated & power tools, Required tolerance - $\pm 0.02\text{mm}$, angular tolerance $\pm 10^\circ$ min.] • Apply a range of skills to execute pipe joints, dismantle and assemble valves & fittings with pipes and test for leakages.[Range of skills – Cutting, Threading, Flaring, Bending and Joining] • Construct circuit of pneumatics and hydraulics observing standard operating procedure & safety aspect. • Plan, dismantle, repair and assemble different damaged mechanical components used for power transmission & check functionality. [Different Damaged Mechanical Components – Pulley, Gear, Keys, Jibs and Shafts.] • Interpret specifications, different engineering drawing and apply for different application in the field of work. [Different engineering drawing- Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales,		

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol]		
Professional knowledge	Knowledge of facts in a field of work or study - Trade tools specifications. - Machines and accessories, - Safety precautions to be observed in a sheet metal workshop, sheet and sizes, - Commercial sizes and various types of metal sheets, coated sheets and their uses as per BIS specifications. - Various types of metal joints, their selection and application, tolerance for various joints, their selection & application. - Oxygen acetylene cutting-machine description, parts, uses, method of handling, cutting torch-description, parts, function and uses - Different standard systems of fits and limits. British standard system, BIS system - Lathe specifications, and constructional features. - Lathe cutting tools- Nomenclature of single point & multipoint cutting tools,	The learner requires to demonstrate knowledge of facts, principles, processes and general concepts, in a field of work or study which is Machining, fitting, mechanical work , etc. Hence NSQF Level is 5 for this descriptor	5

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	- Pipes and pipe fitting- commonly used pipes. Pipe schedule and standard sizes. - Pneumatic actuators:- Types, Basic operation, Force, Stroke length, Single-acting and double-acting cylinders Knowledge of Principles and general concepts in a field of work or study - Physical properties of engineering metal: colour, weight, structure, and conductivity, magnetic, fusibility, specific gravity. Mechanical properties: ductility, malleability hardness, brittleness, toughness, tenacity, and elasticity - principle, method of operating L.P. welding equipment - Interchangeability: Necessity in Engg, field definition, BIS. Definition, types of limit, terminology of limits and fits-basic size, actual size, deviation, high and low limit, zero line, tolerance zone - Wrought iron- : properties and uses.Steel: plain carbon steels, types, properties and uses - the importance of keeping the work free from rust and corrosion. - Non-ferrous metals such as brass, phosphor		

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	bronze, gunmetal, copper, aluminium etc. Their composition and purposes, where and why used, advantages for specific purposes • Fluid power, Pneumatics, Hydraulics, and their comparison, Overview of a pneumatic system, Boyle's law. • Overview of an industrial hydraulic system, Applications, Pascal's Law. • Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality • Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources Knowledge of processes in a field of work or study • Drilling processes: common type (bench type, pillar type, radial type), gang and multiple drilling machine. • Types of Joints-Butt and fillet as per BIS SP: 46-1988 specifications. Gases and gas cylinder description, kinds, main difference and uses. • Setting up parameters for ARC welding machines- selection of Welding electrodes. • Various fitting procedures - marking, Hacksawing,		

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	Chiseling, Filing, Drilling, Taping and Grinding • Method of expressing tolerance as per BIS Fits: Definition, types, description of each with sketch. Vernier height gauge: material construction, parts, graduations (English & Metric) uses, care and maintenance. • Methods of use, care and maintenance of various trade related tools and machines • Tool selection based on different requirements • General turning operations- parallel or straight, turning. Stepped turning, grooving, and shape of tools for the above operations. • Maintenance - Total productive maintenance, - Autonomous maintenance, Routine maintenance • Possible causes for assembly failures and remedies. • Assembling techniques such as aligning, bending, fixing, mechanical jointing, threaded jointing, sealing, and torquing • Metallurgical and metal working processes such as Heat treatment, various heat treatment methods - normalizing, annealing, hardening and tempering, purpose of each method, tempering colour chart. • Treatments to provide a pleasing finish such as chromium silver plating, nickel plating and galvanizing		

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	- Pipe bending methods - Installation, maintenance and overhaul of machinery and engineering equipment		
Professional skill	- Plan and organize the work to make job as per specification applying different types of basic fitting operation and Check for dimensional accuracy - Produce components by different operations and check accuracy using appropriate measuring instruments - Make & assemble components of different mating surfaces as per required tolerance by different surface finishing operations using different fastening components, tools and check functionality - Apply a range of skills to execute pipe joints, dismantle and assemble valves & fittings with pipes and test for leakages - Construct circuit of pneumatics and hydraulics observing standard operating procedure& safety aspect. - Plan, dismantle, repair and assemble different damaged mechanical components used for power transmission & check functionality	The learning outcomes for example 'Produce components by different operations' and 'Construct circuit of pneumatics and hydraulics' require cognitive and practical skills to accomplish tasks that involve understanding requirements; then as per requirements deciding which operations/procedure/tools will achieve desired result; planning the sequence of operations to maximum effectiveness; constantly checking and reviewing plan, etc , all of which involve problem solving and decision making. These are done by selecting and applying basic methods, tools, materials and information. Hence NSQF Level is 5 for this descriptor	5

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	Plan, erect simple machine and test machine tool accuracy		
Core skill	Desired Mathematical Skills - Measure dimensions as per drawing - Ensure dimensional accuracy of assembly by using different instruments/gauges. - Measure dimension of the components & record data to analyse the with given drawing/measurement - Mark as per specification applying desired mathematical calculation and observing standard procedure. - Measure all dimensions in accordance with standard specifications and tolerances. Understanding of social/political - Understand and explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality. - Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources. - Explain personnel finance, entrepreneurship and manage/organize related task in day to day work	The learning outcomes for example 'Measure dimension of the components & record data' and 'Mark as per specification' display the learning outcomes where the learner needs to display desired mathematical skill; understanding of social, political; and some skill of collecting and organising information, communication. Hence NSQF Level is 5 for this descriptor	5

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	for personal & societal growth. Organising information and communication Interpret & use company and technical communication • Conduct appropriate and target oriented discussions with higher authority and within the team. • Present facts and circumstances, possible solutions & use English special terminology. • Resolve disputes within the team • Conduct written communication.		
Responsibility	• Plan and organize the work to make job as per specification applying different types of basic fitting operation and Check for dimensional accuracy. • Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting. • Join metal component by arc welding observing standard procedure. • Join metal components by riveting observing standard procedure. • Produce components by different operations and check accuracy using appropriate measuring instruments. • Make different fit of components for assembling as	The role of fitter is independently responsible to perform the work as per specifications followed by analysis of what needs to be done based on their understanding of various fitting, machining, mechanical working processes, principles and standards. This is indicated in all the learning outcomes. Hence NSQF Level is 4 for this descriptor	4

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

Fitter

Title/Name of qualification/component: Fitter			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
	per required tolerance observing principle of interchangeability and check for functionality. • Produce components involving different operations on lathe observing standard procedure and check for accuracy. • Plan & perform simple repair, overhauling of different machines and check for functionality. • Apply a range of skills to execute pipe joints, dismantle and assemble valves & fittings with pipes and test for leakages. • Construct circuit of pneumatics and hydraulics observing standard operating procedure& safety aspect. • Plan, dismantle, repair and assemble different damaged mechanical components used for power transmission & check functionality. • Interpret specifications, different engineering drawing and apply for different application in the field of work. • Plan and organize the work related to the occupation		

SECTION 3

EVIDENCE OF NEED

What evidence is there that the qualification is needed?

The trade forms a part of the Recruitment Rules of major Employers like BHEL, SAIL, Ordnance Factory Board, Indian Railways etc.

Placement records from few ITIs are enclosed.

What is the estimated uptake of this qualification and what is the basis of this estimate?

The employment prospect for this qualification is very high. There is also high demand for starting the training programme on this trade amongst new institutes. As of now the total seating capacity of the training programme is 6,52,638 (including 30% supernumeraries) approximately in 8,298 ITIs.

What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF?

The qualification is originally designed and approved by NCVT for the Craftsmen Training Scheme and is in existence for the last 60 years. NCVT has been entrusted with the responsibilities of prescribing standards and curricula for craftsmen training, advising the Government of India on the overall policy and programmes, conducting All India Trade Tests and awarding National Trade Certificates.

The qualifications of other bodies are of small duration, are specific and cater to specific job roles whereas this qualification prepares the trainee for multiple job roles like sheet metal worker, Fitter (mechanical assembly), Fitter (fabrication) etc

What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated?

- Mentor Council (MC) for the Production and Manufacturing sector was formed in 2014 to review the curriculum of this qualification under the sector.
- CSTARI, the research wing of DGT, reviews and updates the qualification, in consultation with industries and other stakeholders, on a regular basis by conducting trade committee meetings.
- DGT will keep on doing continuous comparative study in the trade by referring to relevant upcoming qualifications in the National Qualifications Register (NQR) and relevant sectors.

Please attach any documents giving further information about any of the topics above.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

SECTION 4**EVIDENCE OF PROGRESSION**

What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

- Qualifying trainee will obtain an NCVT Certificate in Fitter trade which gives the following options of progression to the trainee:
 - i) National Apprenticeship Certificate or
 - ii) National Craft Instructor Certificate or
 - iii) lateral entry to Diploma in Mechanical/ Production/ Industrial Engineering, as permitted by State Boards of Technical Education.
 - iv) Can join as semi-skilled worker in the industry and can become supervisor after doing part-time diploma in relevant branch of Engineering
- Can appear in 10+2 examination through National Institute of Open Schooling (NIOS) for acquiring higher secondary certificate and can go further for General/ Technical education.

Please attach any documents giving further information about any of the topics above.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.