GENERAL GUIDELINES FOR MEMBERSHIP, COLLABORATION WITH OTHER ENTITIES, INNOVATIVE PROJECTS, RATES OF USAGE OF FACILITIES ETC. UNDER INNOVATION FACILITY CENTER, MIZORAM

A) MEMBERSHIP FOR INNOVATORS:-

1) Any permanent resident of Mizoram, who identifies himself/herself as innovator may be registered as Innovator Member after submission and approval of application under IFC by paying membership fee as prescribed by the Centre. The Membership under IFC may be classified as follows -
   a) Bronze Member – members who have innovation(s) but having no substantial commercialization with his/her innovations.
   b) Silver Member – members who have commercialization of his/her innovation(s) and use his/her innovation not as primary source of income.
   c) Gold Member – members who have commercialization of his/her innovation(s) and use his/her innovations as primary source of income.

      PLUS(+) Member - An innovator having Patent Rights on his/her Innovation will be further classified as *PLUS* in his/her membership. e.g. Gold+, Silver+ etc.
2) Membership fee will be initially of ₹ 200 and the membership may be renewed annually. Membership Application Form is to be submitted to the Centre as per the prescribed format **(Annexure –I)**.
3) Membership of any member can be terminated on grounds of violation of guidelines/rules/regulations or under any circumstance solely determined by Authority of IFC.

B) NON-REGISTERED USERS :-

1) Any non-registered user can utilize the facility by paying prescribed/pre-negotiated rate.
2) Online/phone/spot booking facility will be made available for non-registered users.
3) In the event of partly or wholly damaging of certain machineries/equipment due to unauthorized handling of equipment and giving wrong information about materials provided during booking, repairing or replacing charge will be borne by the user concerned.
4) Any raw material required for the work will be supplied by the user or it may be purchased from the Centre if available.
5) Any transportation and raw material handling cost will be borne by the user.
6) Fine/charge may be imposed on prolonged Parking/Placing of finished product(s) at the Centre by non-registered user.

C) COLLABORATION WITH OTHER ENTITIES:- The center may collaborate with state/central government/international body/entity or private firms by signing agreement for revenue generation, development of innovations, training for capacity building, etc.

D) GRASSROOT INNOVATIVE PROJECTS:-

1) Call for submission of project proposals will be made within a prescribed time. The Project proposal will have to be submitted as per the prescribed format **(Annexure-II).**
2) Research/Project Proposal having indigenous technological innovation and relevance for socio-economic development of the state will be carefully selected for consideration.
3) The screening, scrutinizing and selection of the project proposal will be done by two tier committees viz. Internal Screening Committee (ISC) and Project Selection cum Monitoring Committee (PSMC) formed by MISTIC.
4) The Internal Screening Committee (ISC) may consist of technical staffs under IFC and MISTIC. It may give technical comments/ratings regarding feasibility, possible issues, relevance etc. on the project proposals submitted and forwarded to PSMC for final selection.
5) The Project Selection cum Monitoring Committee (PSMC) will be the IFC Management Committee (IFCMC).
6) The amount or ceiling of project grant and the budget heads will be as per approved by the PSMC.
7) The selection of innovative project will be informed to the innovator applicant and letter of acceptance will be submitted by the selected innovator within 14 days of issue of letter of award.
8) A project grantee will be registered as Innovator under the scheme and will be issued IFC - Innovator Registration Card bearing unique identification number.
9) The project granted under this scheme will be implemented using only the facilities of the Centre and under the guidance of an expert from the Centre. In case usage of facility from other source is required, prior written consent must be taken from the Centre's authority.
10) Purchase of tools which is/are not components of the innovation, from the project grant is/are not allowed and penalty will be decided by PSMC in case of misuse of project grant.
11) The rate of using the facilities for granted Project will be as per prescribed in **Guideline for Rates** and the total projected charge of usage will be credited to IFC account during sanctioning of first installment.
12) The maximum duration of the project will be of one year. Under special conditions viz. unavailability of materials, issues at IFC, health related issues of Innovators and natural calamities, the duration may be extended by the Authority after receiving written application from the Innovator.

13) Only the project completed during stipulated time may be entitled to receive Innovator Incentive which will be pre-included in the project budget proposal.
14) Grants for project will be released in installment basis on submission of Utilization Certificate and Statement of Expenditure as per format prescribed.
15) Project Completion Report must be submitted by the project grantee on completion of the project and Project Completion Certificate will be issued.
16) The innovation/invention under the project deemed suitable for patent, industrial design, etc. will be filed for protection under Intellectual Property Rights laws through Patent Information Centre (PIC) of the Implementing Agency. The Innovator will be the sole owner of the Intellectual Property.
17) Any damage incurred on facilities of IFC due to Project related work will be compensated from the Contingency component of the Project.
18) The Project grantor will have the right to terminate project at any time if conditions laid down in the guidelines are not followed.

E) OTHER ACTIVITIES:-

1) Other activities such as training, workshop, seminar, demonstration, fabrication, etc. that can serve as a medium for providing opportunities to various stakeholders as well as providing means of income generation for the Centre may be taken up from time to time.
2) The technical persons/staff of IFC may also initiate and implement projects/activities that can be taken up on commercial basis with the approval of IFC Management Committee.
3) Avenues/Opportunities may be provided for institutions/associations for having practical exposure/demonstration at the Centre. The amount of entry fee for such activities is fixed at (a) Rs. 10/- per person for group entry of not less than 10 persons (b) Rs. 20/- per person for group entry of less than 10 persons.

F) RATES/CHARGES OF FACILITIES UNDER IFC:-

1) Rate/charge for usage of facilities under IFC will be determined according to the prescribed base rate which may be subjected to change from time to time. Additional rates may be incurred on the basis of workmanship required.
2) Some portable electric/electronic devices can be borrowed from the Centre under certain circumstances approved by authority of IFC upon receipt of application. The charges will be determined on basis of duration of borrow, involvement of IFC staff etc. and any damage/loss will be compensated with equivalent amount of the device or cost of repair. Prescribed base rate and lending rate is given in **Annexure-III**
3) Charges incurred on any work may vary depending on the nature of work and membership as follows :-

a) For non-registered user : Normal Charge (NC) or Base rate as determined by IFC from time to time.
b) For registered user with innovative works :
   i) Bronze Member : 80 % of NC
   ii) Silver Member : 75 % of NC
   iii) Gold Member : 70 % of NC
   iv) For PLUS(+) member : 5 % of NC extra concession
   v) For PLUS(+) member with patent under IFC: 15 % of NC extra concession
c) Generally, non-innovative works will not be permitted at the Centre. In case of unavoidable such works, there will be no concession and they should be paid in full charge.

7) Only person who is given permission by IFC authority is allowed to do operation under IFC. If any registered member is allowed to do operation, he/she must follow the *Guidelines on working in an Innovation Facility Centre* as given in **Annexure-IV**.

ANNEXURE-I

INNOVATION FACILITY CENTRE
Mizoram Science, Technology & Innovation Council

Recent passport Photo

Format for
MEMBERSHIP APPLICATION FORM

1. Name : _____
2. Father's Name : _____
3. Age : _____
4. Male/Female : _____
5. Full Address for Communication : _____
   _____
6. Mobile No : _____
7. Email : _____
8. Educational Qualification : _____
9. List of Innovations developed so far

Sl No	Name of Innovation	Purpose of Innovation	Year of Innovation	Recognition/Award (if any)

10. Type of membership applied for (tick) :
    Bronze ☐ Silver ☐ Gold ☐

    Bronze+ ☐ Silver+ ☐ Gold+ ☐
11. Whether new or renewal (tick) : New ☐ Renewal ☐

I certify that the information I provided is true to the best of my knowledge. I read and agree all the guidelines, rules and regulations laid down by IFC and I will strictly abide by them.

Date :
Place:

Signature
(Name of Innovator)

ANNEXURE-II

FORMAT FOR
SUBMISSION OF PROJECT PROPOSALS UNDER IFC

PROJECT TITLE

_____

Submitted by

_____

To
Innovation Facility Centre
Mizoram Science, Technology & Innovation Council
Directorate of Science & Technology
Govt. of Mizoram

Mizoram New Capital Complex, Khatla, Aizawl
Mizoram, Pin-796001

SUBMISSION OF PROJECT PROPOSAL UNDER INNOVATION FACILITY CENTRE
DEVELOPMENT OF INDIGEOUS TECHNOLOGICAL INNOVATION IN MIZORAM

A. IDENTIFICATION

1) Project title :
2) Area of Innovation:
3) Duration of project :
4) Total cost of project :
5) Principal Investigator
   5.1 Name :
   5.2 Designation :
   5.3 Address :
   5.4 Date of Birth :
   6.5 Sex (M/F) :
6) Co-Principal Investigator(s)
   6.1 Name :
   6.2 Designation :
   6.3 Address :
   6.4 Date of Birth :
   6.5 Sex (M/F) :
7) Capability of the Investigator / Organisation:
   (a) Expertise available / Experience
   (b) List of on-going and completed projects.

B. TECHNICAL DETAILS

1) Background

1.1 Description of problem
1.2 Review of work already done
1.3 Rationale for taking up the project
1.4 Relevance to State priorities / State needs

2) Challenge & Constraints

3) Description of Proposal

3.1 Objectives of the project
3.2 Preliminary Investigations done (if any)
3.3 Other organizations / innovators working in this area
3.4 Methodology detailing stepwise activities and sub-activities.

4) Work Plan (Per-Gantt chart)

Work plan should be provided as per 'Per-Gantt chart' giving names of each work to be implemented month-wise.

5) Output of the Project

Give output of the project in terms of machinery, tools or innovations and how it will be beneficial or can be utilized for economic development of the state.

6) Parameters for monitoring effectiveness of project

Give notes on how the project outcome will have impact on socio-economic development of the state.

7) Suggested Post Project Activities

Give suggestions for activities after the project is completed like plan for marketing, practical utilization of the product, etc.

C. BUDGET ESTIMATES

1) Budget Summary
2) Detailed Budget Estimate of each item with Justifications each (like consumables, construction materials, travel, labour hiring, etc.)

D. PROFORMA FOR BIODATA OF INVESTIGATORS

Principal Investigator

A. Name :
B. Date of Birth :
C. Institution :
D. Whether belongs to SC/ST :
E. Qualification :
F. Award/prize/certificate etc. won :
G. Publication/Innovations (Numbers only) :
- Books :
- Research Paper :
- Reports :
- General Articles :
- Innovations :

H. List of completed and on-going projects :

Co-Principal Investigator

A. Name :
B. Date of Birth :
C. Institution :
D. Whether belongs to SC/ST :

E. Qualification :
F. Award/prize/certificate etc. won :
G. Publication/Innovations (Numbers only) :
Books :
Research Paper :
Reports :
General Articles :
Innovations :
H. List of completed and on-going projects

(NAME OF PRINCIPAL INVESTIGATOR)
With Signature & Seal

Date :
Place :

FORMAT FOR
CERTIFICATE FROM THE INVESTIGATOR

PROJECT TITLE

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1. I/We agree to abide by the terms and conditions of the DITIM grant.
2. I/We did not submit this or a similar project proposal elsewhere for financial support.
3. I/We have explored and ensured that permanent equipment and basic facilities will actually be available as and when required for the purpose of the project. I/We shall not require financial support under this project, for procurement of these items.
4. I/We have enclosed the following documents.
   (a) Details of the proposals (3 nos. hard copy and soft copy)
   (b) Innovator Registration Certificate (If any)
   (c) Registration certificate, Memorandum of Association, rules and regulations of the Institution, audited Balance sheet and Annual report of previous two years. (applicable only for NGOs, field groups registered societies)

(NAME OF PRINCIPAL INVESTIGATOR)
With Signature & Seal

Date :
Place :

ANNEXURE-III

RATES/CHARGES OF FACILITIES UNDER IFC

Sl. No.	Name of Machine	Base rate (In Rupees)
1.	Magnetic drilling machine	30/- per drill
2.	Vertical milling machine	500/- per hour
3.	Universal milling machine	500/- per hour
4.	Shaper	500/- per hour
5.	EDM	500/- per hour
6.	Hydraulic operated surface grinding machine	200/- per hour
7.	Plate rolling machine	400/-
8.	Metal inert gas welding machine	100/-
9.	Heavy duty power press c-type	150/-
10.	CNC Lathe machine	800/- per hour
11.	CNC Milling Machine	800/- per hour
12.	Lathe Machine (Heavy duty)	500/- per hour
13.	Band Saw (Vertical)	50/- per 12 ft timber cut
14.	Gas Cutting Set & welding	100/-
15.	Radial Drilling Machine	30/-
16.	Hydraulic Press	150/-
17.	Band Saw (Horizontal)	50/-
18.	Electric Hacksaw	50/-
19.	Tungsten Inert Gas Welding Set	100/-
20.	Plasma Cutting Machine	100/-
21.	Electrical Welding Set (Single Phase)	30/- per welding rod
22.	Electric Welding Set (Three Phase)	30/- per welding rod
23.	Plate Cutting Machine	100/-
24.	Plate Bevelling	50/-
25.	Press Brake	200/-
26.	Line Cutter	100/-
27.	Powder Coating Equipment	250/- per sq ft
28.	Pneumatic Power Hammer	100/-

RENTAL PRICE OF ELECTRONICS DEVICES

Sl.No.	Machines	From	End	Rates	Extra
1.	Power Analyser	9:00 A.M	5:00 P.M	Rs. 1500	Rs. 500 per night
2.	Digital Thermometer(IR)	9:00 A.M	5:00 P.M	Rs. 500	Rs. 50 per night
3.	Temperature & Humidity meter	9:00 A.M	5:00 P.M	Rs. 500	Rs. 50 per night
4.	Density & Gravity meter	9:00 A.M	5:00 P.M	Rs. 500	Rs. 50 per night
5.	Digital Laser Range Finder	9:00 A.m	5:00 P.M	Rs. 800	Rs. 100 per night
6.	Digital sound level meter	9:00 A.M	5:00 P.M	R.s 400	Rs.50 per night
7.	Digital Light meter	9:00 A.m	5:00 P.M	Rs. 800	Rs. 100 per night
8.	Digital Altimeter	9:00 A.M	5:00 P.M	Rs. 500	Rs. 50 per night
9.	Digital Force Gauge	9:00 A.M	5:00 P.M	Rs. 500	Rs. 50 per night
10.	Electronic GPS	9:00 A.M	5:00 P.M	Rs. 600	Rs. 50 per night
11.	Digital Oscilloscope	9:00 A.M	5:00 P.M	Rs. 1000	Rs. 100 per night

Condition for renting of machines : The machines as stated above cannot be rented consecutively for more than 3 days. Any delay in submission of the borrowed item(s) beyond 3 days will be subjected to a penalty of three times the amount of the rate specified above for every additional day.

ANNEXURE – IV

GUIDELINES ON WORKING IN INNOVATION FACILITY CENTRE

1. Do not operate power tools when you are ill, taking strong medications, fatigued or consuming alcoholic drinks. Do not smoke while working with tools.
2. Wear proper clothing for the type of work being done. Do not wear loose-fitting clothes or jewelry that can get caught in moving parts. Do not roll up long sleeves. Do not wear highly flammable clothes. Do not wear sandals, open-toed or canvas shoes. Wearing safety-toed shoes is preferable for protection of feet and toes.
3. Remove all jewelry, including rings, necklaces, bracelets and watches that could get caught in tooling before starting work.
4 Safety Glasses must be worn at all times in the Centre's shop. Some operations may require additional eye protection or other personal protective equipment.
5. Protect your eyes, face, head, and scalp. At a minimum, wear industrial-quality safety glasses with side shields. Add a face shield or wear impact resistant goggles if flying particles are expected during the machining process. For welding, wear eye and face protection appropriate for the kind of work being conducted.
6. Pull back long hair in a band and tuck it under your shirt collar or a cap to keep it from getting caught in tools. Long beards must also be contained.
7. Avoid distractions, keep your mind on your work. Talking or listening to the radio while running machinery can lead to accidents. Stop working and turn off the power tool you are working with if distracted by something or someone. Never look away from your work when operating a power tool.
8 Keep the work area clean. Keep the floor free of scraps and oil. Cluttered work areas invite accidents. Keeping workshop and storage spaces clean and dry can help prevent many accidents. Sparks can ignite scraps, sawdust and solvents. Water can conduct electricity. Do not stand in water, on damp floors or in the rain when working with electrical tools. Keep hands and tools dry.
9. Food and drinks are permitted only in designated areas.
10. Aisles, exits and access to emergency equipment must be kept clear at all times.
11. Cell phones, mp3 players and other personal electronic devices must not be used with working at any machine. Loud music is prohibited.
12. Use the correct tools for the job. Do not use a tool or attachment for something it was not designed to do. Select the correct bit, cutter or

grinding wheel for the material with which you are working. This saves time and improves the quality of work and reduces the risk of mishap. If necessary, consult the instructions or shop manual, or call a dealer or an expert on tool use.

13. When working with metals, secure the metal materials with clamps or in a machinist's vise to keep it from moving.
14. Work only at operating speed. Do not use a power tool before it has reached operating speed or while it is coming to a stop. Never force a tool by applying too much pressure. Let each tool work at its own speed without forcing it. Once a power tool has been turned off, allow it to coast to a stop. Never force an object into moving parts to stop a machine.
15. Keep tools clean and in good condition. Always clean up power tools before putting them away. Avoid using tools that are or appear to be in disrepair. Use power tools only for their intended functions.
16. Repairing and Cleaning Power Tools - Always turn off and unplug a power tool before (1) adjusting, oiling, cleaning or repairing it; (2) attaching an accessory; or (3) changing bits, blades or grinding wheels. Unplug or lockout tools when not in use. Unplug tools by pulling directly on the plug. Jerking on the cord can cause damage to the tool. Do not leave tools, hardware and other materials out when not in use. Before making adjustments or changing bits or cutters, disconnect the power cord to avoid accidentally touching the switch and possible injury when the tool starts.
17. Compressed Air -
    - Employees shall not use compressed air for cleaning themselves or their clothing.
    - The operator shall not direct compressed air at nearby employees. Compressed air used for cleaning work areas, such as work benches, table saws, and drill presses, shall not exceed 30 psi at the outlet, statically or dynamically, and shall be permitted only with effective chip guarding or personal protective equipment to protect the operator and other employees from flying debris.
18. Keep guards in place – Safety guards cannot provide the intended protection if they are not in place and in proper working order.
21. Do not leave a machine running unattended. Make sure all moving parts have come to a complete stop before you leave the work area or make minor adjustments. In many cases adjustments and repairs require locking and blocking of energy, including stored energy, before proceeding.
22. Know the machine. Before using any tool, read the operator's manual, or comparable literature as available, to learn the applications, limitations, and potential of each power tool. Never use a tool unless trained to do so. Inspect it before each use and replace or repair if parts are worn or

damaged. Repair tools only if you are trained to do so. Inspect screws, nuts, bolts and movable parts to make sure they are tightened. Make sure the cord will not become caught or tangled. The cord should be flexible, but not easy to knot. Clean the cord regularly and inspect the grounding connections. Use a ground fault circuit interrupter when working with power tools.

23. Know the switch location(s). Remember where the switch is located so you can turn off the machine quickly.

24 Use safe blades. Never use cracked or kinked saw blades. Keep saw blades sharp and properly set.

25. Ventilation - No welding, cutting or brazing may occur in the shop. Move equipment to the welding table located under the awning in the courtyard. Avoid operating power tools in locations where sparks could ignite flammable vapors. Keep the shop well ventilated and flammable materials properly stored.

26. Used rags, especially oily and greasy ones, should be kept in a covered, marked container. Rags should be in a safe distance from the welder and other sources of ignition.

27. Hazardous materials - Take extra care when working with hazardous materials. Due to the extreme fire hazard, machining or grinding of magnesium is prohibited in any Machine Shop. Handle fiberglass with care. Its particles can irritate the skin, eyes and respiratory system. When soldering, remember that lead solder is toxic. The work area should be ventilated or you should wear the appropriate respirator if you have been properly trained to do so.

28. Fires - Shop fires can be any, or all, of three fire classes: Class A, ordinary combustibles; Class B, combustible liquids; and Class C, fires in live electrical equipment. To eliminate the need for extinguishers for all three classes, install at least one 20-pound ABC Class extinguisher in a convenient location, and possibly more, depending on the size of the shop.

29. Storage - Develop a system of racks, bins and tool panels to make it easy to find the right tool or materials quickly. Don't store tools, supplies or spare parts in the aisle or on the floor where they become tripping hazards. Keep other flammable materials away from heaters and welding areas to prevent fire. Grease, oil, paint and solvents should be stored in a closed metal container, preferably in metal cabinets. Gasoline or other fuels should never be stored inside the shop. Supplies and equipment should be stored in an area designed specifically for them.

30. Housekeeping. Each user is expected to clean up him/herself after working. Each tool used for working must be kept back to their respective place after using. Good housekeeping helps ensure long tool life and a safer work area for everyone.

31. The conduct of all persons attending the Centre is expected to be respectful of the property. The user is expected to leave the Centre's building reasonably clean and in the same condition it was in prior to the event.
32. Do not use damaged equipment or equipment that does not appear to be operating normally. Tag it out of service and report the problem to the shop supervisor or equipment owner.
33. Immediately report any problems

GUIDELINES FOR WORKING IN LATHE MACHINE

PRE-OPERATIONAL SAFETY CHECKS

1. Locate and ensure you are familiar with all machine operations and controls.
2. Ensure all guards are fitted, secure and functional. Do not operate if guards are missing or faulty.
3. Check workspaces and walkways to ensure no slip/trip hazards are present.
4. Check the job is clamped tight in the chuck.
5. Remove all tools from the bed and slides of the machine.
6. Ensure the correct speed for machining process is selected.
7. Remove the chuck key before starting the lathe

SOP for Lathe Machine

1. Make sure that the chuck or faceplate is securely tightened onto the lathe spindle.
2. When removing the chuck or faceplate do not use machine power.
3. When installing the chuck or faceplate do not use machine power.
4. Move the tool bit a safe distance from the collet or chuck when inserting or removing work.
5. Don't run the machine faster than the proper cutting speed.
6. Always clamp the toolbit as short as possible in the toolholder to prevent it from breaking or chattering.
7. Always make sure that the toolbit is sharp and has the proper clearance. Ask for assistance making adjustments.
8. Do not file on the lathe, unless you have a large amount of experience and have the Shop Manager's approval.
9. If work is turned between centers, make sure that proper adjustment is made between centers and that the tailstock is locked in place.
10. If work is being turned between centers and expands due to heat generated from cutting, readjust centers to avoid excessive friction.

11. Do not grasp or touch chips or turnings with your fingers, but get rid of them using a blunt instrument. It is safer to turn off the lathe before clearing chips then to leave it running.
12. Set the toolbit on center line of work to prevent work from climbing over tool or cutting above center and dragging.
13. Remove chuck key from chuck immediately after using.
14. Turn chuck or faceplate through by hand before turning on the power to be sure there is no binding or clearance problems.
15. Stop the machine before taking measurements.
16. Before cleaning the lathe, remove tools from the tool post and tailstock
17. Stop the machine immediately if odd noise or excessive vibration occurs.
18. When an operator has finished working on the lathe, and before leaving the lathe for any reason, the power must be shut off and the machine must come to a complete stop.
19. The operator must always be aware of the direction and speed of the carriage or cross-feed prior to engaging the automatic feed.
20. Never leave the machine running unattended\

GUIDELINES FOR WORKING IN MILLING MACHINE

PRE-OPERATIONAL SAFETY CHECKS

Locate and ensure you are familiar with all machine operations and controls.

- Ensure all guards are fitted, secure and functional. Do not operate if guards are missing or faulty.
- Check workspaces and walkways to ensure no slip/trip hazards are present.
- Ensure cutter is in good condition and securely mounted.
- Check coolant delivery system to allow for sufficient flow of coolant.

SOP for Milling Machine

1. Work must be clamped securely in a vise and vise clamped tightly to the table, or, work must be clamped securely to the table.
2. Do not take climb milling cuts on the shop's mills unless instructed to do so.
3. Make sure cutter is rotating in the proper direction before cutting material.
4. Before running machine the spindle should be rotated by hand to make sure it is clear for cutting.
5. Make sure the power is off before changing cutters.
6. Always use the proper cutting fluid for the material being cut.

7. Never run the machine faster than the correct cutting speed.
8. Make sure that the machine is fully stopped before taking any measurements.
9. Always use cutters which are sharp and in good condition.
10. Don't place anything on the milling machine table such as wrenches, hammers, or tools.
11. Always stay at the machine while it is running.
12. Don't take too heavy a cut or use too rapid a feed.
13. Remove the collet tightening wrench immediately after using it.
14. If at all feasible, add a shield to prevent chips from hitting other people.
15. Use the milling machine spindle brake to stop the spindle after the power has been turned off.
16. Before cleaning the mill remove cutting tools from the spindle to avoid cutting yourself.
17. Safety glasses worn at all times, by everyone in the shop
18. Do not walk away from running machines.
19. Do not be distracted or talk to others when operating the machine.
20. Switch off the machine when work completed
21. Remove milling cutters and store them safely when work completed.
22. Leave the machine and work area in a safe, clean and tidy state

GUIDELINES FOR WORKING IN DRILL PRESS

PRE-OPERATIONAL SAFETY CHECKS

1. Check workspace and walkways to ensure no slip-hazards are present.
2. Check that the drill chuck guard is in position.
3. Ensure the chuck key (if used) has been removed from the drill chuck.
4. Locate and ensure you are familiar with the operation of the ON/OFF starter and E-Stop (if fitted).
5. Follow correct clamping procedures to ensure work is secure.
6. If the job obstructs the walkway erect a barricade.
7. Adjust spindle speed to suit drill or cutter diameter.
8. Faulty equipment must not be used. Immediately report suspect equipment

SOP for Radial Drilling machine

1. Run drill at correct RPM for diameter of drill bit and material. Ask Shop Manager for the correct RPM.
2. Always hold work in a vise or clamp to the drill table. NEVER hold it by hand!

3. Use a correctly ground drill bit for the material being drilled. Shop Manager can help select the correct bit.
4. Use the proper cutting fluid for the material being drilled. Ask the shop staff about the appropriate fluid for the material you are machining.
5. Remove chips with a brush, NEVER by hand.
6. Ease up on drilling pressure as the drill starts to break through the bottom of the material.
7. Don't use a dull or cracked drill. Inspect the drill before using.
8. Don't drill with too much pressure.
9. Always try to support part on parallels or a backing board when drilling through any material.
10. Never place taper shank tools such as large diameter drills or tapered shank reamers in a drill chuck. Only straight shank tools such as standard drills can be clamped in chucks or collets.
11. Always clean drill shank and/or drill sleeve, and the spindle hole before mounting.
12. Remove taper shank tools from spindle or sleeve with a drill drift and hammer.
13. Never try to loosen the drill chuck while the power is on.
14. Never clean the machine while it is in motion!
15. If the drill binds in a hole, stop the machine and turn the spindle backwards by hand to release the bit.
16. When drilling a deep hole withdraw the drill bit frequently to clear chips.
17. Always remove the drill chuck key or the drill drift from the spindle immediately after using.
18. Wear safety eye protection while drilling.
19. Let the spindle stop of its own accord after turning the power off. Never try to stop the spindle with your hand.
20. Plexiglas and other brittle plastics can be difficult to drill. Ask the Shop Manager for advice on drill and coolant selection when drilling these materials.
21. Never leave the Drill Press while it is running
22. Switch off the machine and Leave the machine in a safe, clean and tidy state.

GUIDELINES FOR WORKING IN (Bench and Surface) GRINDING MACHINE

PRE-OPERATIONAL SAFETY CHECKS

1. Check workspaces and walkways to ensure no slip/trip hazards are present.
2. Ensure all guards and safety shields are in position before starting the grinder.
3. Ensure that the bench grinding wheels do not touch the work rest and that the gap between wheel and rest is no greater than 1.5mm.
4. Check that wheels are running true and are not glazed or loaded.
5. Locate and ensure you are familiar with the operation of the ON/OFF starter.
6. Faulty equipment must not be used. Immediately report any suspect machinery.

SOP for Bench and surface Grinding Machine

1. Abrasive wheel machinery shall not be operated without the appropriate guards in place.
2. Tool rests on bench or pedestal grinders shall be set no more than 1/8 inch from the wheel.
3. Never use a wheel that has been dropped or received a heavy blow, even though there may be no apparent damage. Such wheels may be weakened or unbalanced enough to fly apart on startup.
4. Stand to one side when starting machine.
5. Do not grind on side of wheel unless wheel is specifically designed for such use.
6. Do not use excessive pressure while grinding. On surface grinder do not exceed .0005" inch downfeed at any time.
7. Report to the Shop Manager immediately any cracked, broken or otherwise defective wheels.
8. Have the Shop Manager mount and balance new wheels.
9. Keep the grinding wheel dressed. Dressing a small amount frequently is better than having to dress a lot later and will allow the wheel to cut faster, cooler and with a better surface finish. Dressing is cleaning and smoothing the surface of the grinding wheel.
10. Hold work securely while grinding, use the toolrest to support the work when off-hand grinding on bench or pedestal grinders.
11. Do not grind aluminum. It will clog the wheel and aluminum dust is explosive. Check with shop staff for safety instructions if aluminum must be ground.
12. Always wear safety glasses when grinding on bench or pedestal grinders. The addition of a face shield is recommended.

13. If a magnetic chuck is being used, on the surface grinder, make sure it is holding the work securely before starting to grind.

GUIDELINES FOR WORKING WITH WELDING MACHINE

1. Welders, assistants, and anyone else in the welding area shall wear glasses or shields of recommended shades during welding operations.
2. Inspect all welding equipment to be used, prior to each use, for possible damage.
3. Avoid handling oxygen bottles with greasy hands, gloves or rags. Fatal explosions have resulted from this.
4. Always strap tanks to a welding cart or a fixed object. Never allow a gas cylinder to be free standing. Replace the safety cap on all cylinders when not in use.
5. When doing any kind of TIG/ARC/MIG welding, make sure work and/or work table is properly grounded.
6. Do not weld in or near a wet area or with wet gloves/hands.
7. Be alert to possible fire hazards. Move the object to be welded to a safe location, or, remove all flammable materials from the work area.
8. Never weld in the same area where degreasing or other cleaning operations are performed.
9. Keep suitable fire extinguishing equipment nearby and know how to operate it.
10. Shut off the cylinder valves when the job is completed, release pressure from the regulators by opening the torch valves momentarily and back out regulator adjusting valves. Never leave the torch unattended with pressure in the hoses.
11. Utilize all protective equipment and clothing. Do not weld with any part of the body uncovered, the arc light will cause burns similar to severe sunburn.
12. Never weld inside drums or enclosed spaces without adequate ventilation, or, the use of airline respirators or self-contained breathing apparatus.
13. Check the ventilation system before starting to weld and periodically thereafter to insure adequate performance. Welding fumes should not be allowed to get into the rest of the shop working areas.
14. Never cut or weld any container that has held explosive or flammable materials.
15. Abide by any other safety measures required for each particular type of welding.
16. Allow for proper ventilation when brazing or soldering. The fluxes are acidic and toxic.

17. Do not weld on painted, galvanized or greasy, oily metals. Not only can the fumes be toxic, but the welds will not be satisfactory and will fail in use.

GUIDELINES FOR WORKING WITH SHAPING MACHINE

PRE-OPERATIONAL SAFETY CHECKS

1. Ensure no slip/trip hazards are present in workspaces and walkways.
2. Check that machine guards are in position.
3. Do not leave tools / equipment on top of the machine.
4. Ensure cutting tool is in good condition and securely mounted.
5. Locate and ensure you are familiar with the operation of the ON/OFF starter
6. Faulty equipment must not be used. Immediately report suspect machinery

SOP FOR SHAPING MACHINE

1. Keep clear of moving machine parts.
2. Never leave the machine running unattended.
3. Do not leave equipment on top of the machine.
4. Follow correct clamping procedures- keep overhangs as small as possible and check work piece is secure.
5. Ensure you have selected correct speed and rate.
6. Ensure you have set the correct depth of cut.
7. Before making adjustments and measurements or before cleaning swarf accumulations switch off and bring the machine to a complete standstill.
8. Switch off the machine and Leave the machine in a safe, clean and tidy state.

GUIDELINES FOR WORKING IN CNC LATHE MACHINE

PRE-OPERATIONAL SAFETY CHECKS:

1. Ensure you are familiar with CNC nesting and tool-patting software functionality.
2. Locate and ensure you are familiar with the operation of the ON/OFF and emergency stop.
3. Ensure that front guard door and safety devices are in position and secured.
4. Only machine materials that are suitable for this turning process.

5. Ensure lathe cutting bit size and shape conforms to specifications. The machine must be isolated while any adjustment are made to the cutter head
6. Ensure all the cutters are sharp and free of resin build-up or wear.
7. Adjust the dust collector shroud(where fitted) correctly for maximum efficiency.
8. Be aware of any other personnel in the immediate vicinity and ensure the area is clear before using this equipment.
9. Familiarize yourself with all electrical and mechanical operation and controls, including any handheld keypad interface remote control.

SOP FOR CNC LATHE MACHINE:

1. Never attempt to program this CNC machine without proper training.
2. Never pre-program any CNC lathe to perform operations beyond the capacity of the machine.
3. Confirm all CNC programming instructions for the lathe.
4. Ensure that the material workpiece is secured before turning.
5. Ensure that the coolant system is operational before turning.
6. Ensure all robotic tool array movements remain unobstructed during turning operation.
7. Never leave the CNC lathe in operational mode while unattended.

GUIDELINES FOR WORKING IN CNC MILLING MACHINE

PRE-OPERATIONAL SAFETY CHECKS

1. Ensure you are familiar with CNC “Nesting and Tool pathing” software functionality.
2. Locate and ensure you are familiar with the operation of the ON/OFF and Emergency Stop controls.
3. Ensure that all guards and safety devices are in position and secured.
4. Use only materials that are free of defects.
5. Ensure router cutting bit size conforms to specifications. The machine must be isolated while any adjustments are made to the cutter head.
6. Ensure all cutters are sharp and free of resin build up or wear.
7. Adjust the dust collector shroud (where fitted) correctly for maximum efficiency.
8. Be aware of any other personnel in the immediate vicinity and ensure the area is clear before using this equipment.
9. Familiarize yourself with all electrical and mechanical operations and controls, including any

hand held keypad interface remote control.

OPERATIONAL SAFETY CHECKS

1. Never pre-program any CNC router table to perform beyond the capacity of the machine.
2. Confirm all CNC programming instructions for the table router.
3. Ensure sheet material is secure to the work surface bed when cutting and/or engraving sheet
materials such as ply, acrylic, aluminium, foam or rubber.
4. Ensure all robotic tracking arms remain unobstructed during the cutting/engraving operation.
§. Never attempt to remove waste materials or excess dusts from the work surface while the
machining process continues automatically.
6. Never leave the CNC router table in operational mode while unattended.

GUIDELINES FOR WORKING IN HORIZONTAL/VERTICAL BANDSAW

PRE-OPERATIONAL SAFETY CHECKS

1. Ensure no slip 'trip hazards are present in workspaces and walkways.
2. Ensure you are familiar with the location and operation of the ON/OFF switches
3. Use a properly sized push stick to feed the work into the blade
4. Lower the blade guide and guard so that it clears the part by *4 inch.
5. When cutting wood or plastics start the dust extraction unit before using the saw
6. Faulty equipment must not be used. Immediately report suspect machinery.

FORBIDDEN (Check with instructor for help)

I. Cutting Carbon Composite materials
II. Attempting to cut very small items
III. Cutting cylindrical or irregular stock

OPERATIONAL SAFETY CHECKS

1. Never leave the machine running unattended
2. Change the blade speed only while the machine 1s running
3. Select a proper speed for the blade and material
4. The work piece should be fed forward evenly and held firmly on the table to ensure effective
control during cutting whilst keeping hands in a safe position.
5. Use a push stick when feeding material past the blade.

6. Stop the machine before attempting to back the work away from the blade
7. Do not force a wide blade on a cut of small radius
8. Stop the saw immediately if the blade develops a 'click".

GUIDELINES FOR WORKING IN EDM

1. Safety glasses must be worn at all times in work areas.
2. Long and loose hair must be contained or constrained.
3. Appropriate footwear with substantial uppers must be worn.
4. Close fitting, protective clothing or a workshop apron is encouraged.
5. Rings and jewellery must not be worn.
6. DO NOT wear large leather gloves when operating this machinery

PRE-OPERATIONAL SAFETY CHECKS

1. Be aware about hazards of accidentally touching the electrodes while machining
2. Keep as much area as possible around the machine in dry condition
3. Ensure that the work area and machines are properly grounded.
4. Do not wear conductive jewellery or clothing when using the Machine
5. Wear appropriate eyewear
6. Avoid looking directly into the spark
7. Wear closed toe, non-slip shoes with rubber soles
8. Ensure shoes are comfortable as operators need to stand for extended period of time

OPERATIONAL SAFETY

1. Keep the area around your machine free of flammable materials
2. Stay alert and give your undivided attention to machining. Intoxication while on the job is a strict no

MAINTENANCE

Keep your machine well-maintained. Your machine should clean and lubricated. When it needs maintenance, make sure the work is done by a well-qualified professional.

Basic hygiene maintenance is one thing every operator should be aware of, here is the basic checklist that Sparkonix suggests to machine operators to refer

DAILY

- Clean machine tray
- Clean machine shroud
- Clean tooling, collets, guides, seals, etc.
- Wipe down spindle head and chuck

GUIDELINES FOR WORKING IN HYDRAULIC PRESS

1. Safety glasses must be worn at all times in work areas
2. Appropriate footwear with substantial uppers must be worn.
3. Rings and jewellery must not be worn.
4. Long and loose hair must be contained or constrained
5. Close fitting, protective clothing or a workshop apron is encouraged
6. DO NOT wear large leather gloves when operating this machinery

PRE-OPERATIONAL SAFETY CHECKS

1. Ensure that all guards and safety devices are in position and secured. Adjust all guards to minimum practicable clearances for the material to be pressed.
2. Any guards and safety devices should NEVER be removed, except for maintenance.
3. Locate and ensure you are familiar with the operation of the ON/OFF starter and E-Stop.
4. Working parts should be well lubricated and all jaws, fingers, "V" blocks and blades be free of rust and other foreign matter.
5. Adjust the head rams (teacher only) to suit the material thickness.
6. Adjust, and check that, the "V" forming blocks and/or knife blades is aligned correctly.
7. Be aware of any other personnel in the immediate vicinity and ensure the area is clear before using this equipment.
8. Familiarize yourself with all electrical, hydraulic and mechanical operations and controls.

OPERATIONAL SAFETY CHECKS

1. Strictly only one operator is to use this heavy duty press brake, and when necessary, with a safety observer present.
2. Never use any press or pan brake to bend or fold beyond the capacity of the machine.
3. Ensure that both hands are positioned away from any possible pinch point, e.g. clamping bar.
4. Particular preparation and caution is to be observed when bending rod, strap or spring steel.
5. Never leave the machine in operational mode while unattended.

GUIDELINES FOR WORKING WITH PLASMA CUTTER

PRE-OPERATIONAL SAFETY CHECK

1. Locate and ensure you are familiar with all machine operations and controls
2. Ensure material to be cut poses no hazard.
3. Check workspaces and walkways to ensure no slip hazards are present.
4. Ensure the work area is clean and clear of grease, oil .
5. and any flammable materials.
6. Keep the equipment, work area and your gloves dry to avoid electric shocks. suspect equipment.
7. Ensure the gloves, handpiece and work leads are in good condition
8. Start the fume extraction unit before beginning cutting. Ensure machine is used in a well-ventilated area if not used in a welding bay.
9. Ensure the work leads and hoses do not create a trip hazard.

OPERATIONAL SAFETY CHECKS

1. Ensure machine is correctly set up for current and airflow.
2. Ensure work return earth cables make firm contact to provide a good electrical connection.

ENDING OPERATIONS AND CLEANING UP

1. Switch off the machine and fume extraction unit when work completed.
2. Turn off the air supply and hang up handpiece, hose and welding cables.
3. Leave the work area in a safe, clean and tidy state.

GUIDELINES FOR WORKING WITH PLATE ROLLING MACHINE

PRE-OPERATIONAL SAFETY CHECKS

1. Locate and ensure you are familiar with all machine operations and controls.
2. Ensure all guards are fitted, secure and functional. Do not operate if guards are missing or faulty.
3. Working parts should be well lubricated and the rolls free of rust and dirt.

4. Check workspaces and walkways to ensure no slip/trip hazards are present.
5. Be aware of other people in the area and ensure the area is clear before using equipment.

OPERATIONAL SAFETY CHECKS

1. Adjust both ends of the rollers evenly.
2. Take care during the initial feeding of the workpiece into the rolls.
3. Hold the workpiece sufficiently far back from the edge being fed into the rolls, to allow for the in feed speed of the machine.
4. Wind handle at a slow even rate. Be aware of rotating rollers.
5. Only one person may operate this machine at any one time.

ENDING OPERATIONS AND CLEANING UP

1. Ensure the handle is left in a safe position after use.
2. Leave the work area in a safe, clean and tidy state.

GUIDELINES FOR WORKING WITH PNEUMATIC POWER HAMMER

PRE-OPERATIONAL SAFETY CHECKS

1. Provide adequate protection against hazards for which they are designed.
2. Be reasonably comfortable when worn under the designated condition.
3. Fit snugly without interfering with the wearer's movements or their vision.
4. Be durable.
5. Be capable of being disinfected and cleaned.
6. Be kept in good working condition.
7. Impact resistant face protection should be used in situations where there is exposure to tool operation or when deemed necessary. Impact resistant face protection should be worn over the eye protection and is not intended to take the place of eye protection.
8. Safety shoes and/or steel toe shoes must be worn at all times by anyone operating pneumatic tools and by anyone in the immediate area.
9. Safety hard hats must be worn at all times by anyone operating air tools, particularly when doing overhead work or by anyone in the immediate area.

OPERATIONAL SAFETY CHECKS

1. **DO NOT** turn the tool towards your body or towards anyone else.
2. **ALWAYS** work with the tool firmly pointed to the workface. Operation of the tool without the impact being applied to the workface may result in injury and will also damage the tool.

3. **ALWAYS** inspect the tool steel carefully for cracks or damage. **NEVER** operate pneumatic equipment with damaged tool steel. Be sure that the steel is properly sharpened. Consult your tool steel catalog for proper selection of tool steel for the application.
4. **DO NOT** touch tool steel or other accessories while the tool is working. Wear gloves and make sure rubber handles are in good condition if the tools are fitted with them.

GUIDELINES FOR WORKING WITH HEAVY DUTY POWER PRESS

1. Wear gloves when operating the punch press.
2. When reaching into the press for the purpose of changing punch/die or for the purpose of making internal adjustment, it is mandatory to use a die stop block and or stop the flywheel.
3. When leaving the machine unattended the press operator must turn off the main press control.
4. Keep your hands clear of the machine while cycling. Whenever placing or removing parts from pinch points, if possible, use a tool to avoid placing your hands in the pinch point zone.
5. Before operating, make sure all guards are in place and make sure all adjustment bolts are tight.
6. Hand controls must be used whenever possible.
7. Your foot must be completely removed from the pedal box after completing each cut, on machines that are not equipped with light curtains or other safe guards.
8. Be aware of location of foot control to prevent double or accidental cycle.

PRE-OPERATIONAL SAFETY CHECKS

1. Check for slug clearance under the die set before clamping.
2. Double-check that all clamps are tight before running the press, even if you did not set it up. After changing punches and dies, set the press to jog, to check the clearance and alignment. Set tonnage control.
3. Check that adequate hardware was used for set-up.
4. Check the stoppers and clamps frequently to maintain quality and eliminate mistakes.
5. Ensure striker plate is installed whenever running punch plates.

OPERATIONAL SAFETY CHECKS

1. The press must be at the bottom of the stroke before placing the die set in the press.After clamping a die set, cycle the press to top dead center before adjusting the shut height.
2. Be sure stock material is against stopper before cycling press.
3. Remove all light curtain blockers that are not needed for the job you are doing. Use the minimum amount of blockers for each job. Remove all light curtain blockers when using punch plates that require none.
4. Always ensure that previous material/work piece is removed from the die set or punch plate before proceeding to prevent machine, tooling and personal damage.

5. Never attempt to punch more than one part at a time.
6. Do not attempt to remove parts that are stuck in the tooling, by repetitive cycling of the press. This can damage the tooling and possibly cause personal injury.

7. Always put your tools back after you set-up. Practice good housekeeping at all times.

GUIDELINES FOR WORKING WITH SHEARING MACHINE

PRE-OPERATIONAL SAFETY CHECKS

1. Use all safety guards, material hold-downs and punch strippers as supplied.
2. Ensure that all guards and safety devices are in position and secured.
3. Note: guards and safety devices should NEVER be removed or modified, except for maintenance purposes, and only by an authorized staff member.
4. Be aware of any other personnel in the immediate vicinity and ensure the area is clear before using this equipment.
5. Familiarize yourself with all electrical, hydraulic and mechanical operations and controls, including the roving foot pedal control.

OPERATIONAL SAFETY CHECKS

1. Strictly only ONE operator is to use this heavy duty punch and shear and, when necessary, with a safety observer present.
2. Never use any hydraulic power tool to perform beyond its capacity or intended purpose.
3. Keep well clear of all moving parts during any punching, shearing or v-notching operation.
4. Ensure that both hands are positioned away from any possible pinch point.
5. Always be ready to lift your foot off the roving foot pedal control to stop a mistake from seriously injuring yourself or others.
6. Never leave the machine in operational mode while unattended

GUIDELINES FOR WORKING WITH GAS WELDING/CUTTING

PRE OPERATIONAL SAFETY CHECKS

PRESSURE SETTING

1) Check that the oxygen and acetylene regulator adjusting knobs are loose.

2) Check that both blowpipe valves are closed.

3) Slowly open the cylinder valves on each cylinder for half a turn only.

4) Screw in the regulator adjusting knobs slowly until the delivery pressure gauges register 10 PSI.

5) Purge and check for constant oxygen gas flow. Open the oxygen blowpipe for 2 seconds valve and check the delivery gauge. If necessary re-adjust the oxygen regulator to achieve a 10 PSI pressure. Close the oxygen blowpipe valve.

6) Purge and check for constant acetylene gas flow.

Open the acetylene blowpipe valve for 2 seconds and check the delivery gauge.
If necessary re-adjust the acetylene regulator to achieve a 10 PSI pressure.
Close the acetylene blowpipe valve.

LIGHTING UP

1) Open the acetylene blowpipe valve slightly and light the blowpipe with a flint lighter.
2) Continue to slowly open the acetylene valve until the flame no longer produces soot.
3) Slowly open the oxygen blowpipe valve until a neutral flame is produced.

SHUTTING OFF BLOWPIPE

1) Close the acetylene blowpipe valve first.
2) Then close the oxygen blowpipe valve.

CLOSING DOWN

1) Close down both cylinder valves.
2) Open oxygen blowpipe valve to allow the gas to drain out.
3) When oxygen gauges read zero, unscrew regulator-adjusting knob.
4) Close oxygen blowpipe valve.
5) Tum off acetylene cylinder valve.
6) Open acetylene blowpipe valve and release gas.
7) When acetylene gauges read zero, release regulator adjusting knob.
8) Close acetylene blowpipe valve.

HOUSEKEEPING

1. Sweep the machine down and remove all waste
2. Hang up blowpipe and hoses
3. Leave the machine, as you would like to find it