FITTER - 1st Year

NSQF Level-4 Trade Theory Notes

Modules 1 to 8 (Original Study Notes)

For ITI Students | Capital Goods & Manufacturing Sector

MODULE 1: SAFETY

1.1.01 - ITI Familiarisation

ITI provides vocational training under CTS scheme. Objective: skilled manpower and self-employment. Structure includes Principal, Training Officer, Instructors. Facilities: workshop, tools, hostel, library, apprenticeship.

1.1.02 - Safety Precautions

Accidents are caused. Categories: General (clean floor, no running), Personal (overalls, safety shoes, no jewellery), Machine (guards on, stop before measuring).



1.1.03 - PPE

Protects from hazards. Types: Helmet, safety shoes, goggles, face shield, gloves, ear protection, apron. Select based on hazard. Must meet standards. Mandatory use.

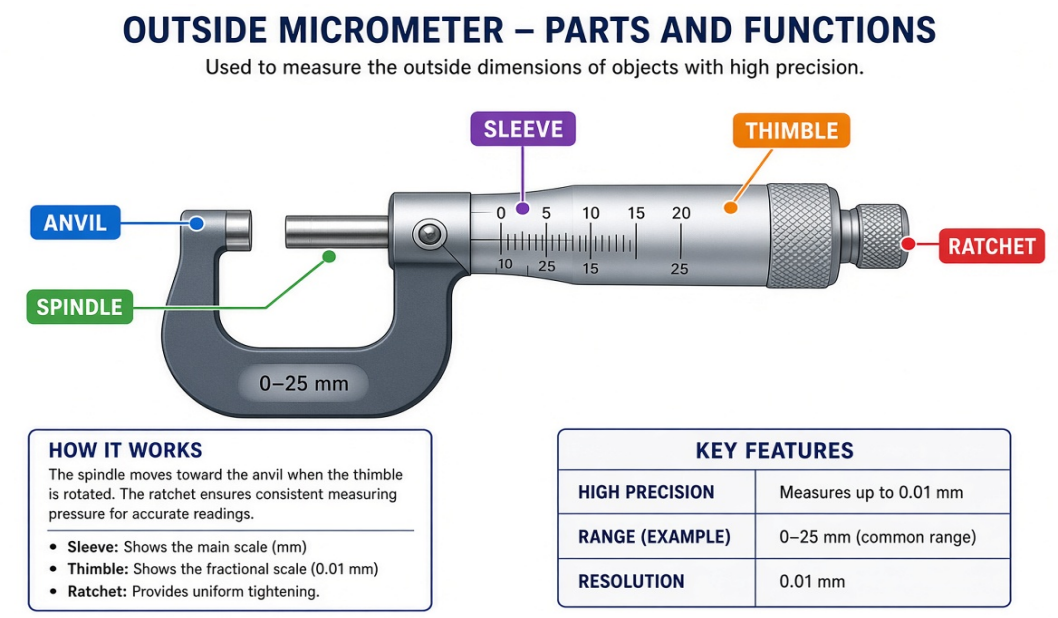


Other: Waste disposal, safety signs, housekeeping (5S), hot work, lifting loads properly.

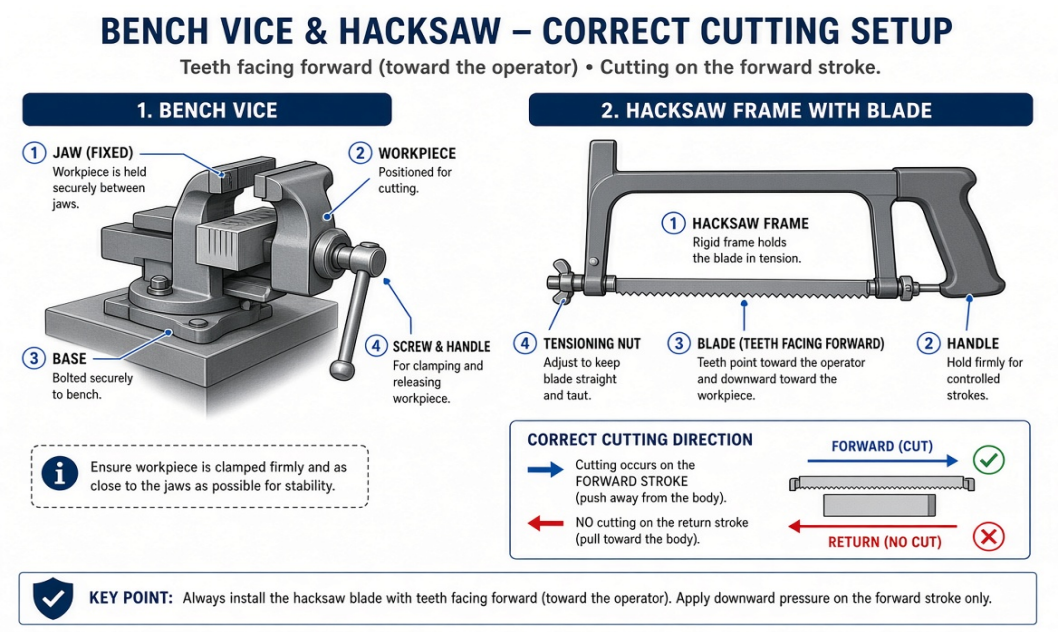
MODULE 2: BASIC FITTING

Linear Measurement: Steel rule, correct eye position. Calipers: Outside, Inside, Odd-leg, Divider. Punches: Centre, Dot, Prick. V-Block for round jobs.

Bench Vice & Hacksaw: Teeth face forward. Files: Cuts (single/double), grades, shapes. Try square for 90°. Cold chisel types and angles.

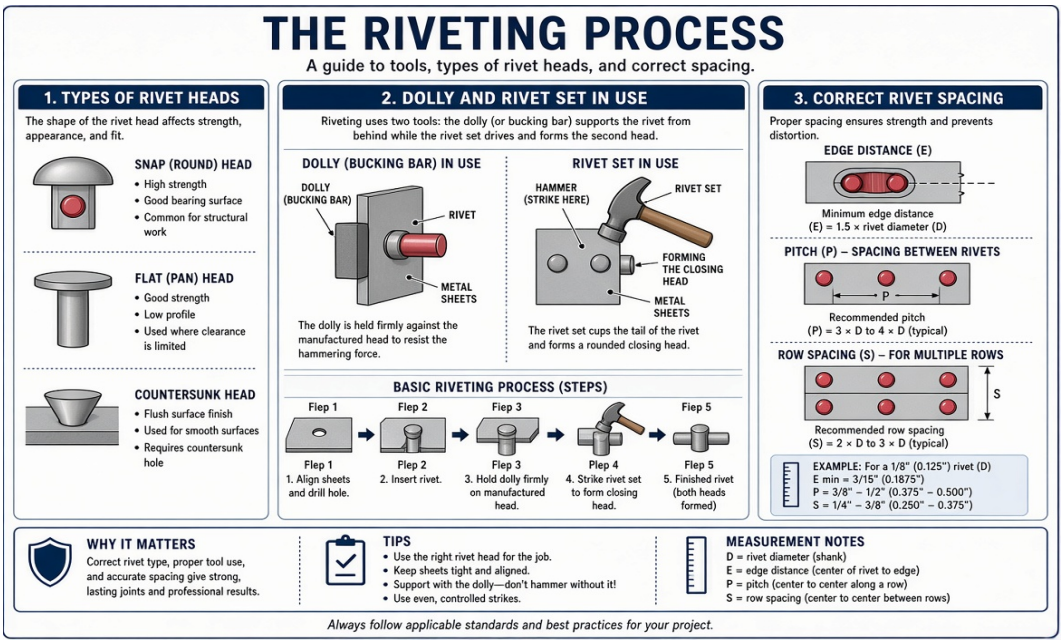


Micrometer, Vernier Caliper: Least count 0.01/0.02 mm. Marking media, Surface plate, Angle plate. Properties of metals: Physical & Mechanical.

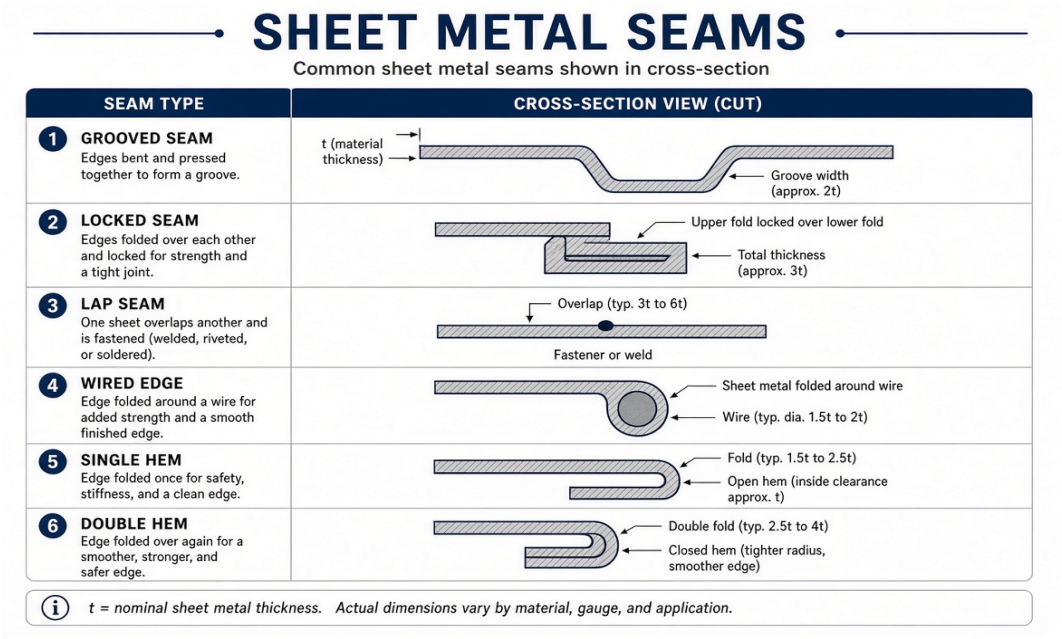


MODULE 3: SHEET METAL

Safety: Gloves, goggles, deburr edges. Snips for thin sheets, Hand lever shears for thicker. Tools: Mallets, hammers, stakes.

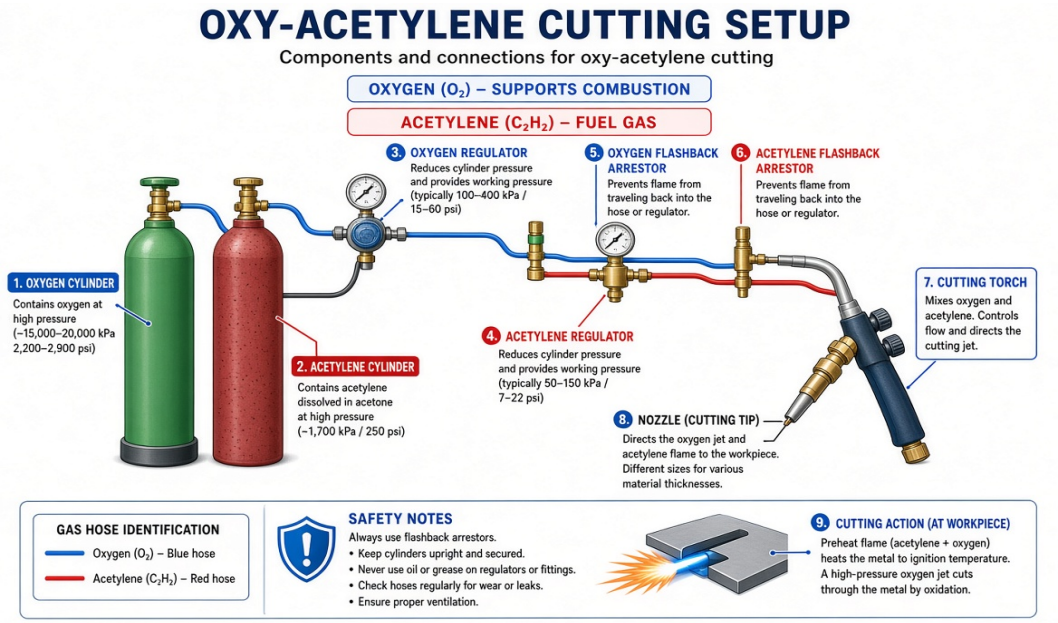


Seams: Grooved, Locked, Lap, Wired edge, Hem. Soldering: Soft solder, flux, clean surfaces. Riveting: Types of heads, process, spacing.

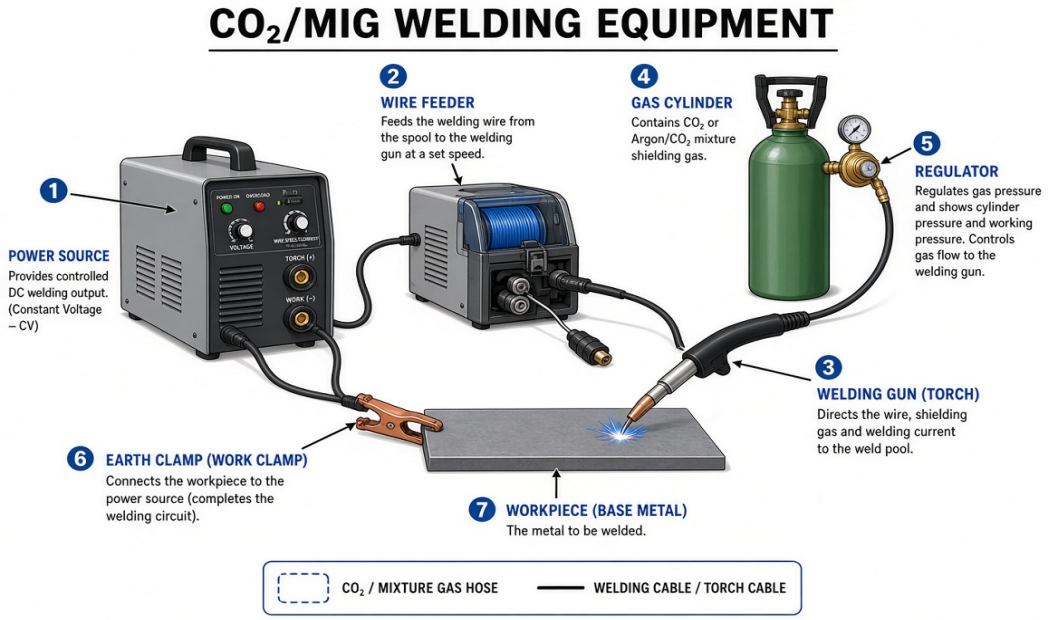


MODULE 4: WELDING

Safety: Helmet, gloves, ventilation. Arc welding parameters: Current, arc length, polarity. CO2/MIG: Wire feeder, gas shielding, high speed.

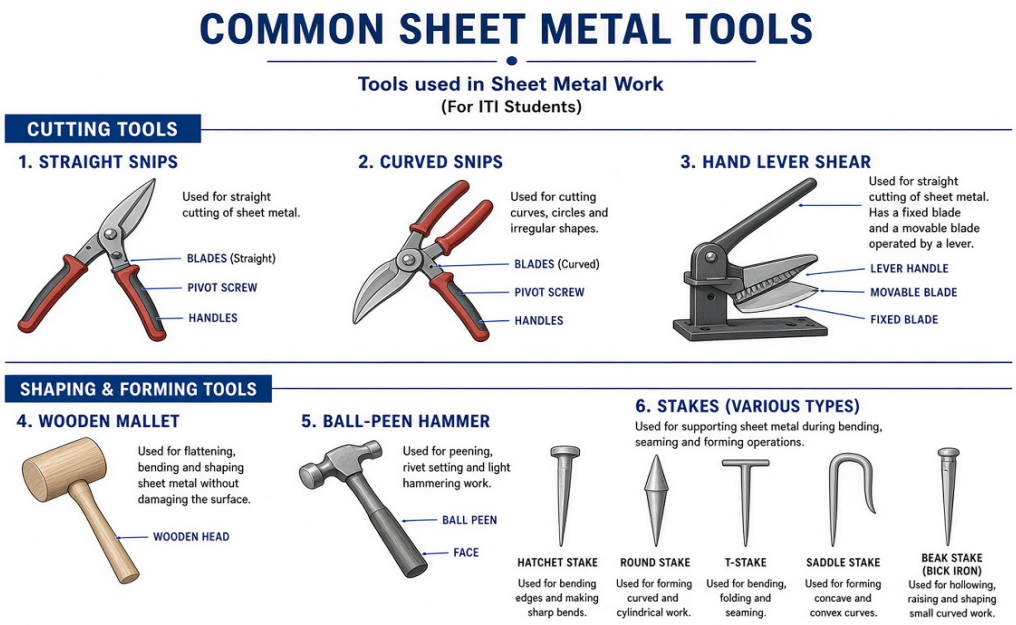


Oxy-acetylene cutting: Cylinders, regulators, flashback arrestors, neutral flame, cutting oxygen. Joint types: Butt, Lap, Fillet.

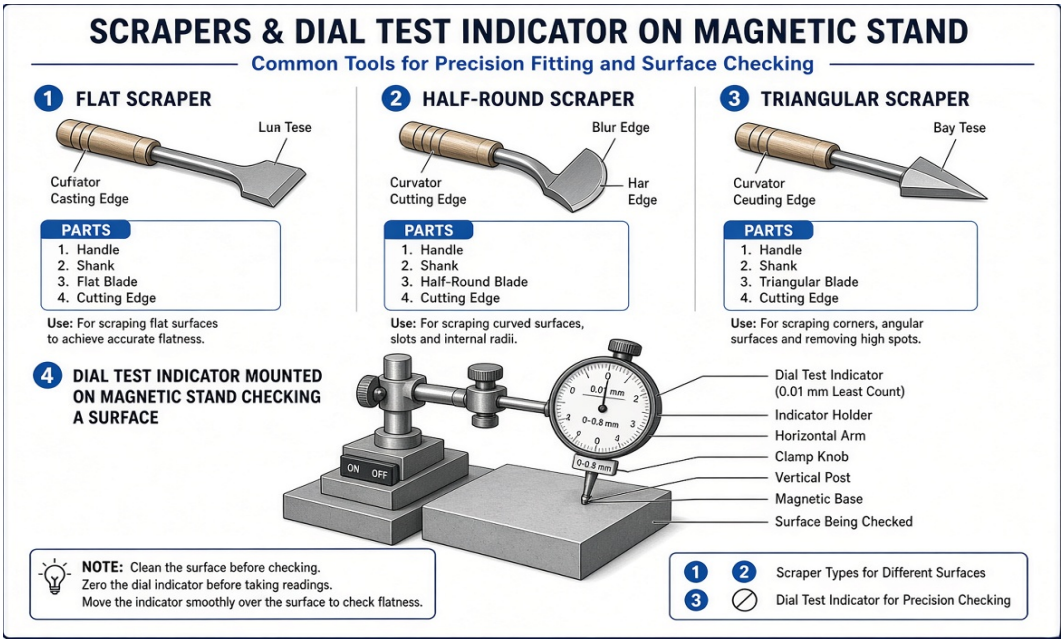


MODULE 5: DRILLING

Twist drill parts and angles (point 118°). Cutting speed, RPM formula, feed. Holding devices: Chuck, sleeve.

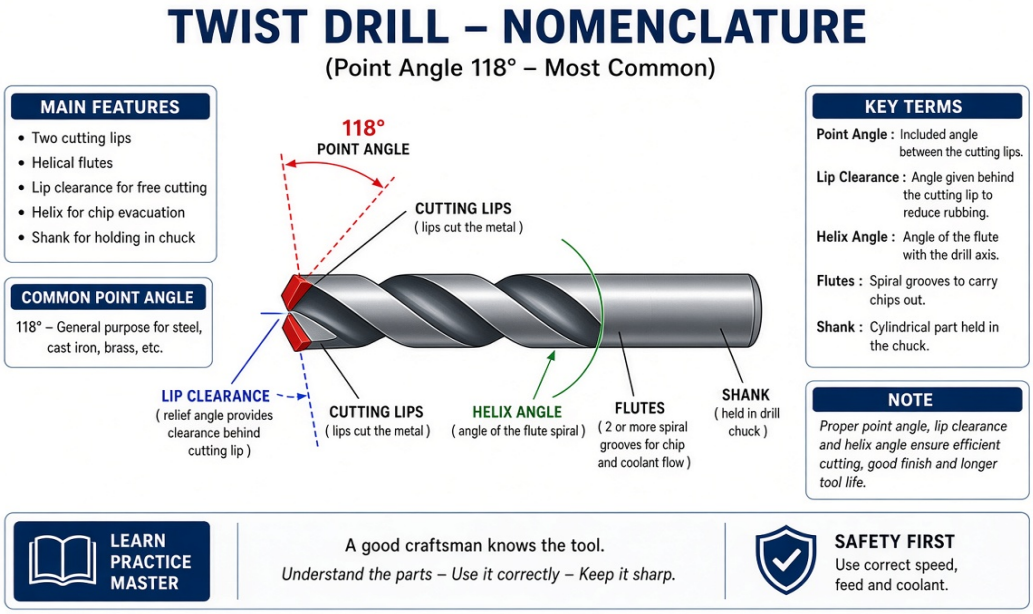


Reamers for accurate finish. Taps (taper, second, bottoming) for internal threads. Dies for external. Drill troubles and remedies. Gauges: Plug, ring, snap.



MODULE 6: FITTING ASSEMBLY

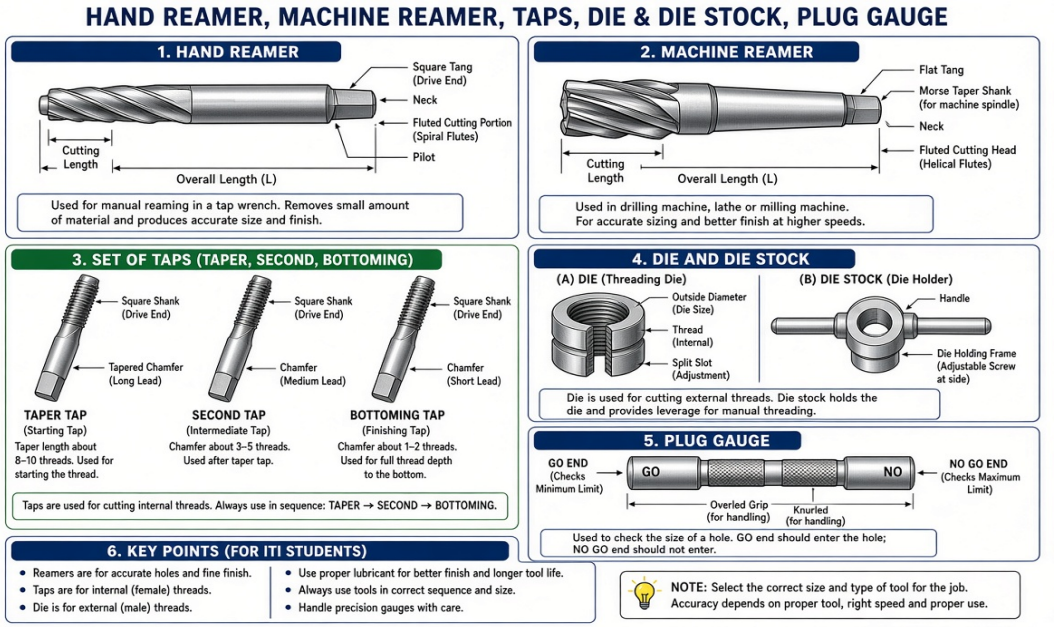
Interchangeability: Limits, fits, tolerance. Hole basis system. Metals: Cast iron, steel, non-ferrous. Scraping: Flat, half-round scrapers, blue matching.



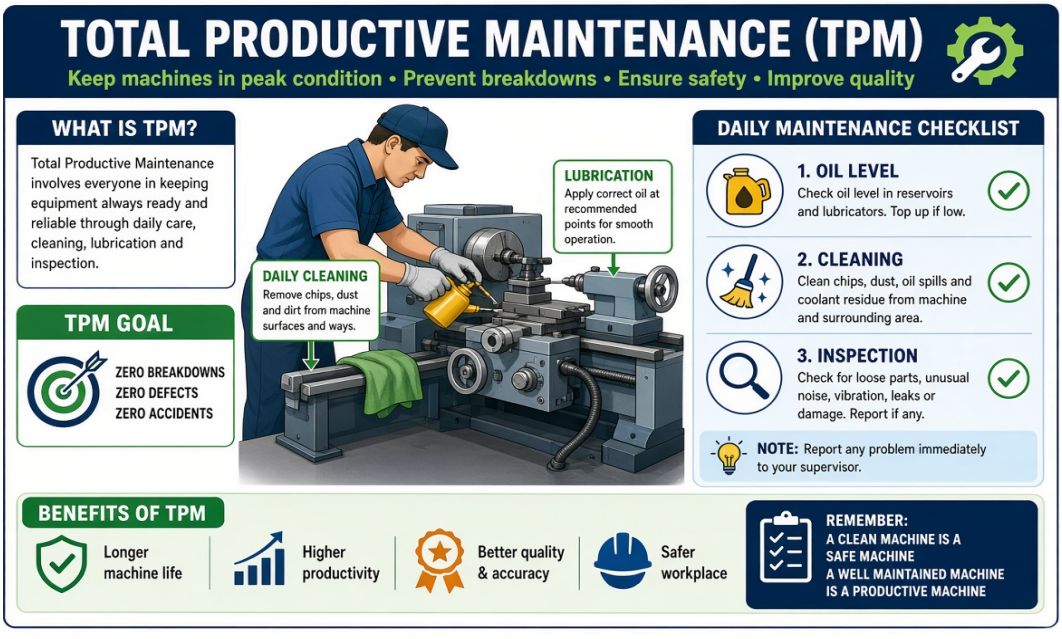
Precision instruments: Vernier micrometer, screw thread micrometer, Dial Test Indicator. Fits: Sliding, Angular, Step, T-fit, Square (±0.04 mm).

MODULE 7: TURNING

Lathe parts: Bed, Headstock, Tailstock, Carriage. Safety. Holding between centres with dog and catch plate. Single point tool angles: Rake, clearance.

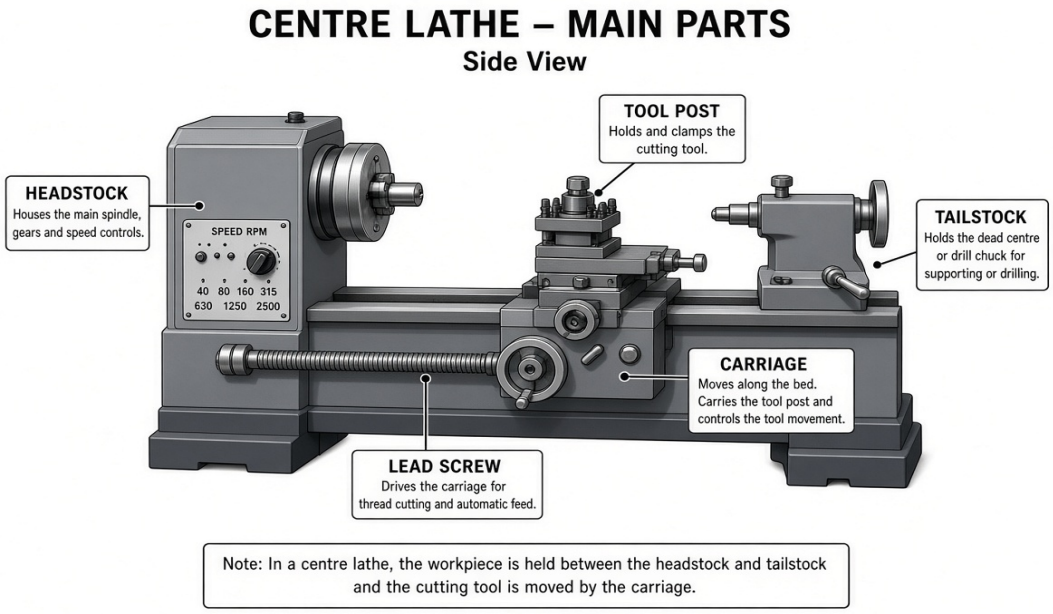


Operations: Facing, turning, step, knurling, taper turning, external threading. Chucks: 4-jaw independent. Cutting speed and feed. Coolants.



MODULE 8: BASIC MAINTENANCE

TPM: Total Productive Maintenance - operator involvement, zero breakdown. Routine maintenance: Daily cleaning, lubrication, inspection.



Preventive maintenance: Scheduled tasks. Inspection types and gadgets. Installation, overhauling, assembly techniques, dowel pins.

End of Notes - Original content for study purpose based on NSQF syllabus topics.