



TOOL & TECHNOLOGY INSTITUTE (TTI), BITAC

Ministry of Industries

Government of the People's Republic of Bangladesh

Address: 116 Kha, Tejgaon Industrial Area, Dhaka-1208



“Advanced Manufacturing, Testing, Tooling, Surface Engineering, and Incubation Hub”

TOOL & TECHNOLOGY INSTITUTE (TTI), BITAC

Integrated Engineering Solutions for Industrial Growth



ONE FACILITY MULTIPLE TECHNOLOGIES

TTI acts as an integrated 'under-one-roof' technology partner. By connecting material composition analysis, rapid CNC cutting, vacuum hardening, surface coating, and high-tolerance 3D Coordinate measuring inspection, we eliminate production bottlenecks and lead times.

CORE STRATEGIC ACTIVITIES

- **Common Facility (Machine Renting)**

Enables light engineering entrepreneurs and tech startups to lease high-tech manufacturing equipment on an hourly basis to lower overhead and scale up operations.

- **Testing Facility (Metallurgical Support)**

Provides comprehensive metallurgical analysis, rapid material composition testing (OES), and physical hardness testing to industries and academic researchers.

- **Direct Manufacturing Orders**

Accepts custom commercial manufacturing orders for precision spare parts, complex tooling, dies, and injection molds built by in-house design and machining teams.

- **Engineering Consultancy & Incubation**

Delivers professional process-optimization consulting and leases co-working desk/office spaces to help early-stage engineering companies establish corporate operations.

TOOL & TECHNOLOGY INSTITUTE (TTI), BITAC

Precision 3-Axis & 5-Axis CNC Milling Services

CNC Machine	Model / Brand	Capacity (W x D x H)	Rate (BDT/hr)
5-Axis Universal Center	Haas UMC-750	762 x 508 x 508 mm	800/-
3-Axis VMC Milling (Large)	Haas VF-6	1626 x 813 x 762 mm	660/-
3-Axis VMC Milling (Medium)	Haas VF-4	1270 x 508 x 635 mm	400/-
3-Axis VMC Milling (Standard)	Haas VF-2	762 x 406 x 508 mm	370/-

CNC MILLING CAPABILITIES

5-Axis Milling (Haas UMC-750):

Optimized for highly intricate 3D contoured profiles, multi-sided machining setups, turbine impeller vanes, and aeronautic components in a single operation.

3-Axis Machining (Haas VF Series):

Heavy-duty high-speed vertical milling tailored for precision tool & die production, structural automotive jigs, complex mold cavity plates, and high-volume part boring/tapping.



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High-Precision CNC Lathe/Turning Center

Turning Center	Model / Brand	Max Working Capacity	Rate (BDT/hr)
4-Axis Lathe (Live Tooling)	Haas ST-30Y	OD 239 x ± 51 x L-826 mm	520/-
4-Axis Lathe (Live Tooling)	Haas ST-20Y	OD 213 x ± 51 x L-572 mm	460/-
2-Axis Lathe (X/Z Axis)	Haas ST-20	OD 213 x L-572 mm	345/-
2-Axis Lathe (X/Z Axis)	Haas ST-10	OD 200 x L-406 mm	265/-

CNC TURNING & LIVE TOOLING

4-Axis Turning & Live Tooling (ST-Y Series):

Combines high-speed turning with secondary milling/drilling operations on a single machine. Drastically improves concentricity and layout accuracy on step-shaft cross holes.

2-Axis Precision Turning (ST Series):

Optimized for extreme-tolerance machining of shafts, industrial bushings, centering pins, locating sleeves, and high-pitch screw threads.



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Electrical-Discharge Machining for Hardened Steel

EDM Machine	Brand / Model	Travel Capacity (X x Y x Z)	Rate (BDT/hr)
EDM Wire Cut (3+2 Axis)	CHMER G64F	600 x 400 x 300 mm	1,115/-
EDM Die Sinking	CHMER CM 655C	600 x 500 x 500 mm	1,035/-

ELECTRICAL-DISCHARGE TOOLING OPERATIONS

Wire-Cut EDM (CHMER G64F):

Achieves ultra-precise micro-kerf profiles and tight 2D/3D geometry cuts in hardened tool steels. Essential for fabricating punch-and-die blocks, keyways, slots, and rogressive tool blanks.

Die-Sinking EDM (CHMER CM 655C):

Uses custom-shaped copper/graphite electrodes to spark-erode complex deep-cavity shapes, blind slots, internal threads, and textured profiles into hardened alloy steel mold plates.



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Sub-Micron Finishing & Accurate Stock Preparation

Equipment / Process	Brand / Model	Technical Capacity	Rate (BDT/hr)
CNC Surface Grinding	Chevalier SMART-B1224III	600 x 300 mm	575/-
CNC Outside Cylindrical Grinding	Sigma Top SRU-3207	Max External Dia 300 mm	800/-
CNC Inside Cylindrical Grinding	Sigma Top SRI-250	Inner Dia 6 - 150 mm	920/-
7-Axis Tool Making	850 G2	Complex Molds & Dies	Custom Quote
Hydraulic Band Saw (Stock Prep)	GZ4260	Accurate stock sizing	Custom Quote



SURFACE INTEGRITY & MATERIAL PREPARATION

Precision Grinding (Chevalier & Sigma Top):

Essential for high-tolerance dimensional correction post heat treatment. Achieves extreme flat, outer, and inner cylindrical bore tolerances of sub-micron thickness and superior surface finishes.

Material Cutting (GZ4260 Hydraulic Band Saw):

Provides accurate and efficient metal stock cutting. Cuts heavy round or rectangular billets to exact raw sizes to optimize machining setups.



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Chemical & Geometric Metrology Verification

Testing / Metrology Service	Equipment / Model	Technical Scope	Rate (BDT)
OES Material Composition (Steel)	Foundry Master Pro-2	Identify steel & Fe-alloys	7,000/test
OES Material Composition (Cu/Al)	Foundry Master Pro-2	Identify Cu & Al-alloys	10,000/test
Coordinate Measuring (CMM)	Mitutoyo CRYSTA-Apex V	X-Y-Z 3D CAD CAD inspection	1,115/hour
Hardness Verification	VERZUS 710 Rockwell	Metallic hardness (HRC/HB)	1,000/test
Surface Roughness / Thickness	Mitutoyo SV-2100 / SV	Thin-film & texture finish	1,000/test
Height Gauge / Pyrometer	Mitutoyo LH-600E / IMPAC	Micro dimension & pyrometer	1,000/test

LAB QUALITY CONTROL SYSTEMS

Mitutoyo 3D CNC CMM (CRYSTA-Apex V 9108):

Provides automatic 3-axis X-Y-Z geometric testing and high-accuracy verification of completed 3D components using interactive CAD file overlays on a flat granite reference table.

Foundry Master Pro-2 Spectrometer:

Rapid spark-OES chemical analysis of Fe, Cu, Al, Ni, Cr, Ti, Zn and Co base alloys to verify raw materials or analyze casting/welding defect compositions.



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Heat Treatment (Hardening, Tempering) & Surface Engineering

Furnace / System	Model / Brand	Chamber Size (mm)	Rate (BDT)
Vacuum Furnace 10 KW	XINKYO® Technology	300 x 250 x 400	As per sample / batch
Vacuum Furnace 30 KW	Brother BR-14HVF-54	300 x 300 x 600	As per sample / batch
Vacuum Furnace 60 KW	Brother BR-14HVF-216	550 x 580 x 550	As per sample / batch
PVD Coating Machine	Thin film (TiC, NiC, Cr, N)	OD 50 x L-100	As per sample / batch
3D Printer & Metal 3D	PLA / ABS / Metal Filament	Rapid Prototyping	As per sample

VACUUM THERMAL & SURFACE COATING ADVANTAGES

Vacuum Heat Treatment (10kW, 30kW, 60kW):

Enables oxidation-free and scale-free hardening, tempering, and stress relieving of high-alloy tool steels. Enhances wear resistance and internal dimensional stability of complex dies/molds.

PVD Thin-Film Coating (TiC, NiC, Cr, N):

Applies super-hard wear-resistant molecular coatings (Titanium Carbide, Chrome/Nickel Nitrides) to industrial cutting blades, drill bits, and injection cores to extend tool life.



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Industrial Case Studies: High-Precision Dies & Molds

COMPLEX MOLD & DIE ENGINEERING

Complete Tooling Development:

TTI specializes in designing and manufacturing intricate injection molds, progressive stamping dies, and custom jigs. These tools are machined from hardened steel, stress-relieved via vacuum furnaces, and precision ground to achieve dimensional tolerances below 10 microns.

Multi-Cavity Mass Production Molds:

Molds fabricated by TTI engineers and incubated startups feature polished cylindrical inserts, standardized guide bush rails, and balanced runner systems. They demonstrate exceptional repeatability, enabling thousands of trouble-free cycles for the local packaging, packaging caps, and plastics industries.



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Custom Engineering Portfolio: Parts, Busbars & R&D

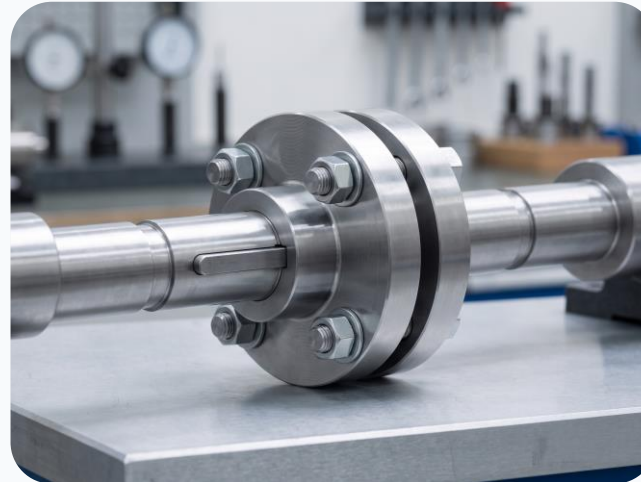
CUSTOM COMPONENT FABRICATION

Advanced R&D and Prototyping:

TTI partners with academic institutions, railways, and industrial associations to develop custom functional metal prototypes. By combining CNC multi-axis milling, grinding, and material chemical verification, we deliver reverse-engineered components equivalent to imported OEM standards.

Heavy Stamping & Stamping Dies:

TTI produces specialized shearing, forming, and deep-drawn sheet-metal press tooling assemblies. We also manufacture custom electrical copper busbar arrays with high conductivity and complex geometries.



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Talent Development: Startup Incubation & 4IR Training

STARTUP INCUBATION CENTER

TTI BITAC provides dedicated desk spaces, private offices, and technical mentoring for talented entrepreneurs, engineers, and tech startups. This ecosystem drastically reduces upfront hardware overhead:

- **Direct Machine Access:**

Startups can utilize advanced VMC milling, multi-axis turning, EDM profiling, and metallurgical labs right outside their office doors on an hourly rental basis.

- **Low-Risk Product Launching:**

Eliminates the multi-million dollar capital cost of buying industrial machinery. Encourages local reverse engineering and product innovation.

HIGH-TECH 4IR PRACTICAL TRAINING

TTI offers hands-on, hardware-grounded technical training programs for diploma and graduate students to bridge the engineering skill gap:

- **CNC Machining & CAD-CAM Integration:**

Students master Mastercam/NX, generate G-code programs, and physically operate Haas CNC Machining and Turning Centers.

- **Industrial Automation (PLC, HMI, Electronics):**

Covers Siemens/Omron PLC programming, HMI touch-interface design, electronic circuit debugs, and sensor calibration.

- **Hydraulics & Pneumatics Engineering:**

Hands-on assembly of hydraulic manifolds, valve controls, cylinder actuators, and safety circuits.

- **Mold & Die Design and Fabrication:**

Comprehensive coursework detailing plastic injection mold calculations, die clearance formulas, and CHMER EDM tooling.

TOOL & TECHNOLOGY INSTITUTE (TTI), BITAC

Why Partner with TTI? Operational & Booking Policies

THE TTI VALUE PROPOSITION

- **Advanced Technological Infrastructure:**

Full access to international-grade Haas CNC milling, 4-axis turning, CHMER EDM wire-cutting, high-vacuum heat hardening, and PVD coating.

- **Seamless 'Under-One-Roof' Workflows:**

Saves logistical time. Projects move rapidly from raw material band saw cutting to CNC profile milling, heat treatment, PVD surface coating, and Mitutoyo CMM metrology inspection.

- **Industries Served:**

Supports automotive components, tool & die, packaging, injection molding, electrical/electronics, agricultural machinery, and reverse engineering.

OFFICIAL BOOKING & RATE POLICIES

- **Minimum Charges & VAT/TAX:**

All rates shown in the official catalog are minimum rental charges. These rates are inclusive of government-regulated VAT and Tax (IT).

- **Dynamic Cost Adjustments:**

TTI BITAC reserves the right to scale hourly machine rates or testing fees based on work complexity, material hardness, sample geometry, required tolerances, and rush delivery lead times.

- **Strict Operational Guardrails:**

To prevent equipment damage, highly specialized testing machines and delicate metrology instruments (OES Spectrometers, Mitutoyo CMM, etc.) are operated strictly by TTI's in-house engineering team and technicians.