Department of Applied Mechanics
Indian Institute of Technology Delhi
20/05/2014

NIQ for 1. Optical Table 2. Bread Board & 3. Opto-mechanical Components for Optical Tweezer

Sealed quotations in two bids (Technical and commercial in separate sealed envelopes) are invited for Binocular inverted microscope. We would like to upgrade the microscope in future, so flexible architecture for future up-gradation is needed.

Please Include <u>Itemized Pricing</u> for every parts you quote, without which bid would not be accepted. Make sure, you give the price of ITEM 1, ITEM 2 & ITEM 3 absolutely separately, we are going to add them in a process the committee decides. Optics items (lenses, mirror etc)should come from well established propriety companies. The committee might want to judge the supplier's previous sell record in India.

ITEM 1

1. Optical Table with Active Vibration Isolation System

Requirements:

1. Table Thickness: >200 mm
2. Size: Length 1800 mm, Width 1200 mm or bigger.
3. Surface Flatness of at least ± 0.15 mm over any 1 m^2 .
4. Construction: Symmetrical Isotropic Construction in All Axes.
5. Top & Bottom Plates: At least 5 mm Thick Stainless Steel, 430 grade working surface.
6. Core Construction: High-Density Plated Steel Honeycomb, >0.26 mm Thick.
7. Damping: Proprietary Optimized Broadband Damping.
8. Broadband Damping Constrained Layer Core, damped working surface and composite edge finish.
9. Side Panels: Rigid Steel Box Section.
10. Side Trim Finish: Matte Black Linoleum, 2mm inset from Table Surface.
11. Top Surface Finish: Machined Matte Finish.
12. Mounting Holes: M6 Tapped Holes on 25 mm Grid.
13. Distance from Edge to First Holes: 12.5 mm from Table Edge on all Sides.
14. Maximum Screw Depth: Compatible with the thickness.
14. Maximum Dynamic Deflection Coefficient: $<0.4 \times 10^{-3}$
16. Maximum Relative Tabletop Motion: <0.14 nm
17. Deflection Under Load (Stiffness): <1.7 um for a 150 Kg Load.

Active Vibration Isolation: Optical Table Support:

1. Vertical Resonant Frequency: 1.25 Hz or better.
2. Horizantal Resonant Fequency: 1.0 Hz or better.
3. Vertical Transmissibility at Resonance: 10 dB or better.
4. Horizantal Transmissibility at Resonance: 12 dB or better.

5. Vertical Transmissibility at 5Hz: -20 dB (90%) or better
6. Horizantal Transmissibility at 5 Hz: -24 dB (94%) or better
7. Vertical Transmissibility at 10 Hz: -32.5 dB (97.5%) or better
8. Horizantal Transmissibility at 10 Hz: -30 dB (97%) or better.
9. Maximum Load Capacity: (Set of four): 5000 lb (2500 kg)
10.Height Adjustment Range: -13 mm, +5 mm
11. Self Leveling Repeatability: 0.5 mm
12. Heigth: 700 mm
13. Air Pressure (Maximum): 551 kPa
14. Finish: Back Paint
15. Include 4 Caster wheels.

Air Compressors:

1. Compressor with 220 V
2. Operating Sound Level (1 ft) (dB): 30
3. Release Value Sound Level (dB): 62
4. Max. Air Pressure: 87 Psi or beter.
5. Air Delivery: 17 l/min at 87 psi.
6. Air Tank Size: > 2.0 L
7. Air Intake Filter: Yes
8. Automatic Turnoff Switch: Yes

ITEM 2

Solid Optical Breadboard:

1. Breadboard Size & Thickness: Atleast, 600 mm X 600 mm X 10 mm
2. Flatness: ± 0.1 mm over any 0.2 m^2 or similar.
3. Construction: Solid.
4. Material: Aluminium
5. Treatment: Anodized.
6. Mounting Holes: M6 Through Tapped Holes at 25 mm Grid.

ITEM3

Optomechanical Components for "Optical Trap Setup"

1. Zero-Order Quartz Wave Plate, 12.7 mm, 1064 nm, $\lambda/2$ Ret. No: 1

Type Zero-Order Quartz Waveplates
Wavelength Range 1064 nm
Diameter 0.50 in. (12.7 mm)
Thickness 0.25 in. (6.35 mm)
Material Quartz, Schlieren Grade
Clear Aperture 8.0 mm
Surface Quality 10-5 scratch-dig

Construction Two plates, air spaced
Diameter Tolerance +0/-0.076 mm
Retardation _/2
Retardation Accuracy ±_/300
Damage Threshold 2 J/cm2 with 10 nsec pulses, typical
Wavefront Distortion __/10 at 632.8 nm over the full aperture
Reflectivity per Surface Laser Line V-coating, R <0.25%
Cleaning Non-abrasive method, acetone or isopropyl alcohol
on lens tissue recommended, caution: fragile, thin optic

1a. Thick Polarizer Rotation Mount, 25.4 mm, 2^0 Grads, 1^0 Sens. No: 1

Type Polarizer Mount
Optic Diameter 1.0 in. (25.4 mm)
Sensitivity 1 °
Graduations 2 °
Travel, Coarse 360 °
Optic Thickness 12.7 mm
Clear Aperture 0.75 in.

1b. Polarizer Adaptor,12.7 mm Optics to 1.063-20 Threaded Mounts No: 1

Base Material Aluminum
Optic Diameter 0.5 in.

1c. Optical Mounting Post, 25.4 mm, 12.7 mm Dia, Stainless Steel, M4 & M6 No: 1

Type Optical Post
Diameter 0.5 in. (12.7 mm)
Height 1.0 in. (25.4 mm)
Thread Type M4 and M6
Material Stainless Steel.

1d. Multifunction Slotted-Base Optical Post Holder, 2.0 in. Height No: 1

4. Broadband Polarizing Cube Beamsplitter, 25.4 mm, 900-1300 nm No: 2

Shape Cube
Type Broadband Polarizing Cube Beamsplitters
Material SF 2, NSSK grade, precision annealed optical glass
Thickness 1.0 in. (25.4 mm)
Dimensions 25.4 x 25.4 x 25.4 mm
Wavelength Range 900-1300 nm
Antireflection Coating 900-1300 nm (PB.7)
Angle of Incidence 0°±5 °
Thickness Tolerance ±0.254 mm
Surface Accuracy __/4 at 632.8 nm over the clear aperture
Surface Quality 20-10 scratch-dig
Efficiency Tp >80%, >90% average, Rs >99.5% average
Extinction Ratio Tp/Ts >500:1, 1000:1 average
Wavefront Distortion __/4 at 632.8 nm over the clear aperture
Transmitted Beam Deviation _5 arc min
Reflected Beam Deviation 90° ±5 arc min
Orientation To avoid damage, beam should enter prism marked with a dot
Clear Aperture Central diameter, >80% of dimension
Temperature Range -50 to 90 °C
Damage Threshold 2000 W/cm2 CW, 1 J/cm2 with a 10 nsec pulse, typical

Durability MIL-C-675C, moderate abrasion million cycles
Cleaning Non-abrasive method, acetone or isopropyl alcohol
on lens tissue recommended see Care and Cleaning of Optics

4a. Cube Beamsplitter Holder, 1 inch **No: 2**

Type Cube/Prism Mounts

4b. Optical Mounting Post, 25.4 mm, 12.7 mm Dia. Stainless Steel, M4 & M6 **No:2**

Type Optical Post
Diameter 0.5 in. (12.7 mm)
Height 1.0 in. (25.4 mm)
Thread Type M4 and M6
Material Stainless Steel

4c. Multifunction Slotted-Base Optical Post Holder, 2.0 in. Height. **No:2**

Type Optical Post Holder
Diameter 0.5 in. (12.7 mm)
Height 2.0 in. (50.8 mm)
Thread Type 1/4-20, M6 Slot

5. Plano-Convex Lens, N-BK7,25.4 mm Diameter, 100 mm **No: 6**

Lens Type Spherical
Lens Shape Plano-Convex
Effective Focal Length 100 mm
Diameter 1.00 in. (25.4 mm)
Antireflection Coating 1000-1550 nm (AR.18)
Lens Material N-BK7
Surface Quality 40-20 scratch-dig
f/# 3.9
Wavelength Range 1000-1550 nm
Center Thickness 4.585 mm
Center Thickness (Tc) Tolerance ±0.1 mm
Te 3.0 mm
Edge Thickness (Te) Tolerance 3.0 mm, nominal
Diameter Tolerance +0/-0.1 mm
BFL 96.97 mm
FFL 100.00 mm
Focal length tolerance ±1 %
Radius of Curvature 51.680 mm
P2 -3.02 mm
Clear Aperture _central 90% of diameter
Centration, Spherical Lenses _3 arc min
Surface Accuracy, Power (lambda) 1.5 _
Chamfers 0–0.8 mm face width
Chamfers Angle/Tolerance 45° ±15°, typical
Cleaning Non-abrasive method, acetone or isopropyl alcohol
on lens tissue recommended

5a. Universal Fixed Lens Mount, 5.0 to 46.2 mm Diameter **No: 6**

Type Adjustable Lens Mount

Optic Size Held 0.20-1.82 in. (5.0-46.2 mm)
Thread Type 8-32 and M4
Optical Axis Height 1.25 in. (31.8 mm)

5b. Optical Mounting Post, 25.4 mm, 12.7 mm Dia. Stainless Steel, M4 & M6 No: 6

Type Optical Post
Diameter 0.5 in. (12.7 mm)
Height 1.0 in. (25.4 mm)
Thread Type M4 and M6
Material Stainless Steel

5c. Multifunction Slotted-Base Optical Post Holder, 2.0 in. Height No: 6

Type Optical Post Holder
Diameter 0.5 in. (12.7 mm)
Height 2.0 in. (50.8 mm)
Thread Type 1/4-20, M6 Slot

6 Ultra-broadband Dielectric Mirror, 25.4 mm, 99% 0-50°,650-1130nm No: 5

Mirror Shape Round
Wavelength Range NIR
Diameter 1.00 in. (25.4 mm)
Material UV Grade Fused Silica
Surface Quality 20-10 scratch-dig
Wavelength Range 650-1130 nm
Reflectivity Rs, Rp>99% @ 610-1130 nm
Coating Code BB.2
Clear Aperture _central 80% of diameter
Coating Type Ultra-broadband Dielectric
Surface Flatness __/10 at 632.8 nm over the clear aperture
with power removed
Chamfers 0.51 ± 0.25 mm face width bevel mm face width
Thickness 0.25 in. (6.35 mm)
Diameter Tolerance ±0.25 mm
Thickness Tolerance ±0.25 mm
Wedge <3 arc min
Damage Threshold 2 J/cm2 at 20 ns, 20 Hz at 1064nm
Cleaning Non-abrasive method, acetone or isopropyl alcohol
on lens tissue recommended

6a Mirror Mount, Lab Standard, 1.0 in. Diameter, 2 Knob Actuators No: 5

Optic Diameter 1.0 in. (25.4 mm)
Mechanism Kinematic
Drive Type Knob
Adjustments _x, _y
Special Features Center Mount
Angular Range ±4 °
Sensitivity 3.8 arc sec
Adjustment Screw Thread 100 TPI
Material Aluminum

6b. Optical Mounting Post, 25.4 mm, 12.7 mm Dia. Stainless Steel, M4 & M6 No: 5

Type Optical Post

Diameter 0.5 in. (12.7 mm)
Height 1.0 in. (25.4 mm)
Thread Type M4 and M6
Material Stainless Steel

6c. Multifunction Slotted-Base Optical Post Holder, 2.0 in. Height **No: 5**

Type Optical Post Holder
Diameter 0.5 in. (12.7 mm)
Height 2.0 in. (50.8 mm)
Thread Type 1/4-20, M6 Slot

7 Amplified Biased Photodetector, AC coupled, 1000-1600 nm, 1.5 GHz **No: 1**

Wavelength Range 1000-1600 nm
Detector Material InGaAs
Rise Time <400 ps
Fall Time <400 ps
Cut Off Frequency >1.5 GHz
NEP <30 pW/_Hz
Acceptance Angle 20°
Saturation Current 1.3 mA
Output Connector BNC
Measurement Type Beam shape, frequency
Mounting (tapped hole) 8-32 and M4
Amplified Yes
Conversion Gain (into 50_) 900 V/W
Bias Voltage 24 V

Optional Accessories:

7a Grounding Wriststrap **No: 1**

7b. Optical Mounting Post, 25.4 mm, 12.7 mm Dia. Stainless Steel, M4 & M6
Type Optical Post
Diameter 0.5 in. (12.7 mm)
Height 1.0 in. (25.4 mm)
Thread Type M4 and M6
Material Stainless Steel

7c. Multifunction Slotted-Base Optical Post Holder, 2.0 in. Height
Type Optical Post Holder
Diameter 0.5 in. (12.7 mm)
Height 2.0 in. (50.8 mm)
Thread Type 1/4-20, M6 Slot

8. Laser Source **No: 1**

Yeterbium-doped fiber laser, YLM series with the following specifications:
M^2<1.1
Output optical power of up to 5 W
Laser wavelength in the near infrared (1070 nm)
Power fluctuations <2 %
Built-in laser collimator: collimated beam diameter (1.6 mm)

General guidelines:

1. Please quote the above item on FOB (freight on Board) mode as per the IIT Delhi policy.
2. If the above system is a proprietary item then a Propriety certificate should be enclosed.
3. Letter from the manufacturer specifically to quote for this tender is to be attached for authenticity of dealership/agency and the dealer should be authorized service provider.
4. Vendor should get a fresh certificate directly from their product principal clearly mentioning about three years warranty of the equipment to be delived from the date of installation.
5. The validity of the quotation should be at-least three months, the vendors will do the installation, training and demonstration in the IIT Delhi premises without additional charges.
6. Taxes, terms and conditions should be clearly mentioned.
7. Specifications form should be similar to the given specification sheet.
8. Compliance statement for the required specification should be attached.
9. Payment terms and conditions should be clearly mentioned. No advance payment is encouraged by IIT Delhi.
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11. Firm MUST provide a compliance statement vis-a-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature with clear reference of page number, paragraph or lines.
12. The bidder must be a reputed Original Equipment Manufacturer (OEM) or an authorized local agent.
13. Further, if the Indian agent quotes for the above mentioned item on behalf of the foreign supplier, then the Indian agent should be enlisted with the department of Expenditure, Ministry of Finance (Govt. of India). Copy of the supporting documents has to be enclosed with the quotation. Further, in the letter it should be clearly stated from the bidder is an authorized agent.

The institute/purchase committee has the right to accept or reject any bid or all quotations without assigning any reasons whatsoever. Quotations should be addressed to

Dr. Sitikantha Roy
Department of Applied Mechanics
Indian Institute of Technology Delhi
Hauz Khas, New Delhi 110016