QUALITY CONTROL MANUAL

Harold Johnson Optical Laboratories, Inc.
1826 W. 169th Street
Gardena, CA 90247

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Harold F. Johnson Jr., President

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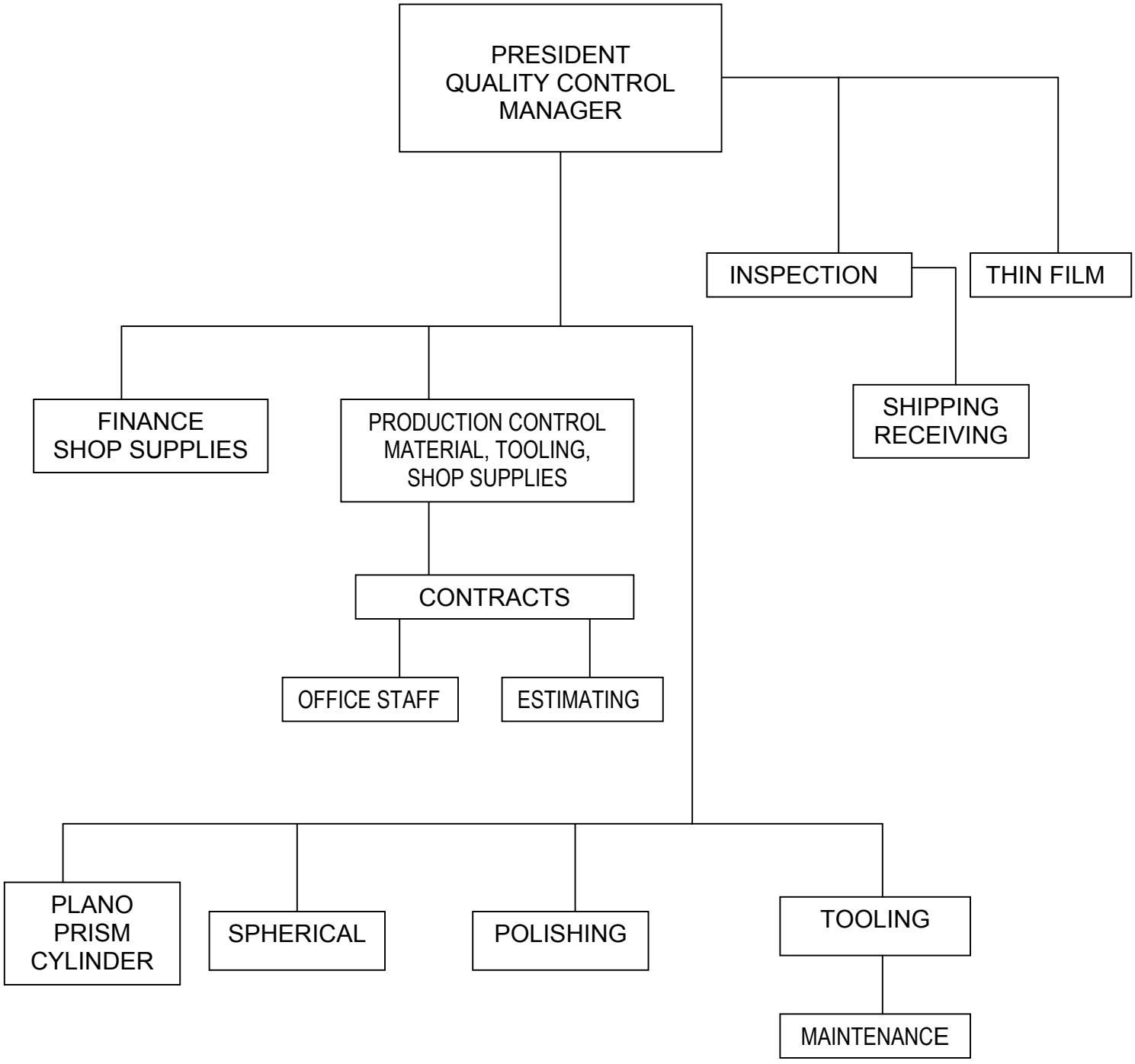
INTRODUCTION

THE BASIC INSPECTION AND QUALITY CONTROL PROGRAM IS PRESENTED HERIN TO DEFINE THE INDIVIDUAL STEPS AND ILLUSTRATE THE OVERALL COVERAGE OF THE INSPECTION PROCEDURES OF THE HAROLD JOHNSON OPTICAL LABORATORIES.

THIS MANUAL AND SUBSEQUENT PROCESSING PROCEDURES WERE COMPILED AND INITIATED SO THAT ALL REQUIREMENTS OF MIL-STD-45662 AND MIL-I-45208A ARE FULLY ADHERED TO BY HJOL PERSONNEL.

REVISIONS AND ADDITIONS TO THIS MANUAL SHALL BE INCORPORATED AS REQUIRED BY CONTRACTUAL OBLIGATIONS.

ORGANIZATION CHART



1. QUALITY CONTROL PROGRAM

1.1. APPLICABILITY. All services and supplies furnished by Harold Johnson Optical Laboratories, Inc. shall be governed by the specifications in the contract or order.

1.2. CONTRACTUAL INTENT. This manual is intended to assure the customer of a sound quality control program and all HJOL employees are indoctrinated as to the importance of the processing and documentation set down by this manual and governing specifications.

1.3. SUMMARY. The quality control program at HJOL is designed to be effective and economical. Proper controls are enforced from date of order, through processing and final inspection and shipping. Materials and services performed by outside manufacturers shall be controlled by the quality control officer of HJOL by survey, certifications or inspection. During processing, inspection points are noted in the job flow sheets so that discrepancies can be detected without excess loss of time. All inspection points are documented on the job travel sheet.

1.4. APPLICABLE DOCUMENTS. This manual was compiled using the following specifications as a reference:

MIL-I-45208A

MIL-STD-45662

Insert Flow Sheet

Insert Shop Traveler

2. QUALITY CONTROL MANAGEMENT

2.1. ORGANIZATION. The President of HJOL shall be the Quality Control Manager. The Chief Inspector shall report directly to the Quality Control Manager.

2.2. INITIAL QUALITY PLANNING. All interim inspection stations shall be defined and the necessary tooling obtained and certified. Complete inspection instructions shall be given to proper personnel if not incorporated in customer furnished drawings.

2.3. RECORDS. Unless stated differently on the customer purchase order, all inspection records will be on file at HJOL (for a minimum of 7 years) and will be available for review by the proper representative of the customer. Duplicates of inspection reports can, on request, become a part of the order at no charge and be shipped with the finished article.

2.4. CORRECTIVE ACTION. By the input of frequent inspection stations, defective material or workmanship will by detected immediately. Changes in processes or tooling will be made if necessary and time will be allotted for continuous surveillance until problems are solved. Corrective action requests from customers will be investigated and answered within the time specified in the request documentation. The quality manager is responsible for responding to customer cause and corrective action requests.

2.5. COSTS RELATED TO QUALITY. When jobs in process are scrapped or require rework, a new job order shall be issued so that cost data can be available for review by the customer representative.

2.6. SCOPE OF THE CHIEF INSPECTOR. As noted in 2.2, the duties of the Quality Control Officer will be divided between the Chief Inspector and the company president. The chief Inspector's duties are as follows:

1. Interim Inspections
2. Receiving Inspections
3. Final Inspections
4. Packaging and shipping
5. Source Inspections
6. Control of measuring and test equipment
7. Member of Material Review Board
8. Disposition of non-conforming material
9. Quality Control records

2.7. SCOPE OF COMPANY PRESIDENT AS A MEMBER OF QUALITY CONTROL TEAM

1. Contract administration
2. Procurement and purchasing,
   through Production Control
3. Laison between HJOL and outside manufacturing
4. Member of Material Review Board
5. Special processes control
6. Evaluation of inspection procedures

3. FACILITIES AND STANDARDS

3.1. DRAWINGS, DOCUMENTATION, AND CHANGE.

As HJOL is primarily a service company, there will not be drawings or specifications generated within the company to be used in conjunction with customer contracts. All work done will be to drawings and specifications furnished by the customer. Drawings and documentation will be on file at HJOL for a minimum of 7 years.

3.2. DRAWING AND CHANGE CONTROL.

After a change or new drawings are received, production control shall stamp with appropriate date, and incorporate said changes in all job process sheets.

3.2.1.

Production Control will immediately collect all obsolete drawings and specifications and replace with new. The old drawings shall be returned to the customer or be destroyed (per customer instructions). All production records will be changed to proper letter or number.

3.2.2.

The estimator shall be given copies of the changes by Production Control and will instruct management as to any delays in delivery or price change.

3.2.3.

The Chief Inspector will meet with the company president to make possible changes in inspection or quality control procedures and will make the necessary number or letter changes on inspection records and reports.

4. MEASURING AND TESTING EQUIPMENT

4.1. SCOPE. In accordance with MIL-STD-45662 a system of calibration has been set forth by the management of HJOL to calibrate or test all inspection and quality control tools and instruments. It shall be the duty of the Chief Inspector to make the proper tests or assign the test to a competent employee. Those tools or instruments that cannot be tested in-plant will be transported to an approved laboratory for tests and certification. When required, all measuring and testing equipment and production tooling and fixtures are to be available for use by customer representatives. HJOL employees shall be made available to operate any tools or fixtures.

4.2. PROCESS CONTROLS. Any process control established in the factory shall become a part of the inspection system.

4.3. INTERVAL OF CALIBRATION. A master list of the tools and instrumentation to be calibrated at pre-determined intervals shall be posted by the Chief Inspector. The time period between calibrations shall be based on usage and stability of the unit to be tested. This interval may be cut short or extended should the test equipment show that its stability has changed with use. Should the need arise to temporarily extend the calibration due date of a particular piece of equipment (i.e. should that piece be in use), the equipment shall be tagged "calibrate immediately after use" and the equipment shall then be calibrated when the testing is complete. All calibration standards shall be traceable to the N.I.S.T.

4.4. TOOLS AND INSTRUMENTS TO BE CALIBRATED.

TOOL OR INSTRUMENT	TEST LAB	INTERVAL OF CALIBRATION
Interferometer	In House	1 year
Surface Plate	In House	1 year
Autocollimator	In House	1 year
Spectrophotometer	Tom Black	1 year
Optical Flats	In House	2 years
Master Gage Blocks	Precision Instr.	1 year
Micrometers	In House	90 days
Stage Microscope	In House	1 year
Zygo	Zygo	1 year

*additional tools will be listed as soon as acquired

4.5. IDENTIFICATION OF TOOLS AND INSTRUMENTS

4.5.1. Each tool or instrument to be calibrated will be assigned a number and will be marked such. A computer program will be maintained for each calibrated unit, listing the part number, inspection interval, next inspection period, a statement as to its trueness, what adjustments were made, and signature of the inspector. This file will be checked monthly by the Chief Inspector to see that these checks are made in the proper time. All records shall be held for a period and not less that 5 years.

4.5.2. Certified blocks are available to each area using hand tools. The calibration of these tools will be verified using the gage blocks prior to each use. Where possible, all test equipment shall be labeled to indicate when the item was last calibrated (day, month, year) and when the item is due to be calibrated in the future. Should there not be enough space to apply a label, the label shall be applied to the box or container that holds the item.

4.5.3. All test equipment shall be calibrated per procedures set forth in the owner's manual supplied by the manufacturer. The equipment shall be held to an accuracy that is set forth by the manufacturer. Any piece of test measurement equipment that is found to be significantly out-of-tolerance shall be "tagged" as such and sent to the manufacturer for repair and/or recalibration.

4.6. ENVIRONMENTAL CONDITIONS. For the purpose of maintaining a stable test environment, the temperature of the facility shall be held from 68 degrees and 78 degrees Fahrenheit. This may deviate under special conditions such as bonding of lenses using cements that must be used in a cold (55 degree F) environment.

4.7. OUTSIDE SOURCES. All calibration sources shall be surveyed every 24 months.

5. CONTROL OF PURCHASES

5.1. SELECTION OF QUALIFIED SUPPLIERS. It is the responsibility of the company president to supply to Production Control (who will issue purchase orders) a list of qualified vendors. A constant check on receiving inspection records shall be made.

5.2. TRANSMITTANCE OF CUSTOMER REQUIREMENTS. All purchase orders issued to vendors shall stipulate complete compliance to drawing and specifications. Each order will carry the reference job number, a drawing (if practical), and will ask for certification of materials and workmanship. In some cases, chemical testing and certification may also be required.

5.3. EVALUATIONS OF PROCURED ITEMS. The Chief Inspector, upon receiving purchased parts or material shall call to Production Control's attention, any discrepancy that may be present. A complete inspection report shall be kept on file for future reference. Gross discrepancies or continued problems will be brought to the company president's attention and may result in the removal of vendor from approved list.

NOTE: HJOL uses only those suppliers and processors that have been approved by Government agencies or primary contractors that sell mainly to the government.

Certification of material processes is our only requirement as we do not have instrumentation for testing of these materials or processes.

5.4. APPROVED SUPPLIER AND PROCESS SOURCE

MATERIAL

Schott Glass Technologies
400 York Avenue
Duryea, PA 18642

Corning Glass Works
Corning, NY

Dynasil Corporation
Cooper Road
Berlin, NJ 08009

Almaz Optics
12 Chadsford Ct.
Marlton, NJ 08053

United Lens Company
259 Worcester Street
Southbridge, MA 01550

Hoya Optics, Inc.
3400 Edison Way
Strement, CA 94538

Melles Griot
1770 Kettering Street
Irvine, CA 92614

Glass Fab, Inc.
257 Ormond Street
Rochester, NY 14605

Lattice Materials Corp.
516 East Tamarack Street
Bozeman, MT 59715

Sogem - Afrimet Inc.
1212 Avenue of the Americas
New York, NY 10036

APPROVED SUPPLIER AND PROCESS SOURCE

MATERIAL (con't)

Heraeus Amersil
3473 Satellite Blvd.
Duluth, GA 30136

Industrial Glass Products
4229 E. Union Pacific
Los Angeles, CA 90023

Ohara Corporation
23141 Arroyo Vista
Suite 200
Rancho Santa Margarita, Ca 92688

Naked Optics Corporation
8 Heritage Court
North Branch, NJ 08876

COATING

ZC&R Coatings for Optics
1401 Abalone Avenue
Torrance, CA 90501

Denton Vacuum, Inc.
1259 North Church Street
Moorestown, NJ 08057

United Lens Company
259 Worcester Street
Southbridge, MA 01550

Guernsey Coating Laboratories
1788 Goodyear Avenue
Ventura, CA 93003

Thin Film Lab
112 Sawkill Road
Milford, PA 18337

APPROVED SUPPLIER AND PROCESS SOURCE

COATING (con't)

Lambda Research Optics
1695 W. MacArthur Blvd.
Costa Mesa, CA 92626

Lattice Electro Optics
375 S. Acacia Avenue
Fullerton, CA 92831

Spectrum Corporation
100 E. Knickerbocker Avenue
Bohemia, NY 11716

Evaporated Coatings, Inc.
2365 Maryland Road
Willow Grove, PA 19090

PLATING

Anchor Plating Company
1734 N. Tyler Avenue
South El Monte, CA 91733

TESTING

U.S. Testing Lab
5555 Telegraph Road
Los Angeles, CA 90040

Big Sky Laser Technologies, Inc.
PO Box 8100
601 Haggerty Lane
Bozeman, MT 59715-2001

RETICLES

Klarmann Rulings, Inc.
480 Charles Bancroft Hwy.
Litchfield, NH 03052

APPROVED SUPPLIER AND PROCESS SOURCE

MOUNTS AND METAL PARTS

Mechanical Concepts
429 Fernando Court
Glendale, CA 91204

CEMENT AND ADHESIVES

Summers Laboratories
Fort Washington, PA 19034

Norland Products, Inc.
North Brunswich, NJ 08902

Monarch Pacific
Lake Forest, CA 92630

Construction Products
Carson, CA 90745

CHEMICALS

Southdown Environmental Systems
Rho-Chem Facility
PO Box 6021
425 Isis Avenue
Inglewood, CA 90301

Del Amo Chemical
535 W. 152nd Street
Gardena, CA 90248-1610

CALIBRATION OF TOOLS

Simco Electronics
19804 Nordhoff Place
Chatsworth, CA 91311

Precision Instrument Correction Inc.
933 Mariner Street
Brea, CA 92821

6. MANUFACTURING CONTROLS

6.1. BIDDING. Upon receipt of Request for Quotation, the estimator will review the compatible specifications and initiate HJOL Request for Quotation to proper vendor for material of parts, transferring all pertinent specifications, data and including all testings and certification requests that may be necessary.

6.1.1. Upon receipt of material or parts pricing, a complete job estimate, including inspection points will be completed.

6.1.2. Customer's RFQ will be completed and mailed and/or faxed. HJOL copies for the RFQ will be filed in "Quotation" drawer.

6.1.3. Any planned deviation from the customer specification will be noted on quotation that is sent to the customer.

6.2. CONTRACTS. On receipt of contract, the quotation and accompanying documents are removed from file and processed.

6.2.1. A purchase order number is designated for the necessary parts or material, again, all specifications and drawing data pertinent to the contract will become part of HJOL purchase order.

6.2.2. A Job Order number is assigned.

6.2.3. All paperwork shall be maintained by production control, until material is received for processing.

6.2.4. Upon receipt of material, receiving inspection is to inspect material to HJOL purchase order. If there are any discrepancies, the HJOL company president is notified and will decide disposition. If material is approved, the Chief Inspector will stamp the packing slip as such. Material certifications shall be filed by Chief Inspector in approved area.

6.2.5. All paperwork and material is given to production control for placement in factory.

6.3. INTERIM INSPECTION. In the initial compiling of job work sheet, inspection points are noted after each operation, or as often as practical.

6.3.1. Employees on the production line may be designated "Inspector" by the Chief Inspector who will initiate the proper controls with calibrated tooling or instruments. The shop traveler will show the inspector's findings and the signature of the "inspector".

6.3.2. The Chief Inspector will be notified immediately when line inspectors report discrepancies.

6.3.3. All other in-process inspections shall be completed in the inspection area. All job paperwork will accompany the units or parts to be inspected.

6.4. FINAL INSPECTION. It is the duty of the Chief Inspector to oversee all final inspections and to make certain that all necessary steps of inspection are finalized.

6.4.1. Interim inspection forms shall be obsoleted. All interim inspections shall be noted on reverse side of shop traveler sheet.

6.4.2. A final inspection report is completed and recorded by a 100% testing of measurement of each unit on order.

6.4.3. Upon completion of physical test, each unit is to be wrapped in a protective material and the inspected parts and all compatible records and paperwork is given to the Chief Inspector.

6.5 FINALIZING OF INSPECTION. The Chief Inspector will make certain that all inspection operations have been completed.

6.5.1 Proper identification stamps and tags are in place.

6.5.2 Check parts for damage during transfer.

6.5.3 If source inspection is required, Production Control is asked to arrange for source inspection.

6.5.4 After the source inspection has been completed and approved, the Chief Inspector shall notify Production Control to arrange for the proper Government Departmental inspector for approval of inspected parts and acceptance of same, if needed.

6.5.5 The Chief Inspector shall have all necessary forms completed and proper stamps or markings on packing slip and other supporting documents necessary for shipping.

6.5.6 Parts and paperwork are given to shipping department.

7. HANDLING, STORAGE AND DELIVERY

7.1 RECEIVING INSPECTION. All incoming material or parts will be the responsibility of the Chief Inspector.

7.1.1 All purchased material or parts will be immediately tagged by Inspection, noting job order number, drawing number, material type, and melt number.

7.1.2 Upon completion of receiving inspection, parts and all paperwork will be given to production control for processing.

7.1.3 All certifications to be held on file in inspection area.

7.2 MATERIAL STORAGE. If incoming parts are not scheduled for processing, they shall be taken to the material area for storage.

7.3 DELIVERY. The Chief Inspector shall be responsible and will monitor all shipping.

7.3.1 All paperwork, including certifications, tags, packing slips and inspection reports will be included in all shipments.

7.3.2 The Chief Inspector will insure that all parts will be protected with proper material and boxed in compliance with contractual requirements.

7.4 SPECIAL PACKAGING.

7.4.1 Production Control will be responsible for Special Material protection and shipment.

7.4.2 Production Control will stamp on job order, flow sheet, and production control card when incoming purchase orders require special material and handling.

7.4.3 Production Control will be responsible for purchasing and/or utilizing the proper material or techniques specified on purchase order.

7.4.4 The Chief Inspector, when shipping, will stamp over Production Control stamp that all requirements according to the vendor's purchase order have been met.

Insert Final Inspection Sheet

8. NONCONFORMING MATERALS

8.1 MATERIAL REVIEW BOARD. As discussed in sections 2.6 and 2.7, the Chief Inspector and the Company President shall be members of the Material Review Board, as will the representative of the customer.

8.1.1 All nonconforming parts, whether outside purchased or in-house manufactured, will be held in a locked storage cabinet, tagged as rejected, while waiting decision of the board.

8.1.2 The decision of the board shall be rendered in writing, signed by members of the board, and filed with job inspection reports.

8.2 DISPOSITION OF MATERIAL. After decision is made, material will be accepted, and tagged as such; rejected and returned to vendor, if outside purchased, accompanied with proper inspection reports; or returned to Production Control if rework is so ordered.

8.2.1 If HJOL parts are rejected and cannot be reworked, parts will be tagged as such and given to the Chief Inspector for disposal.

8.2.2 If HJOL parts are rejected and can be reworked, they are tagged as rejected and given to Production Control so that a new job number can be assigned and a new delivery date assigned.

9. STATISTICAL QUALITY CONTROL ANALYSIS.

9.1 SAMPLING. As HJOL is primarily a low volume manufacturing company, it is not probable that production can be so great that we cannot 100% inspect each part. However, if such an order should arise, the sampling plans will conform to documents MIL-STD-105, MIL-STD-414 or Handbooks H106, 107, and 108.

10. INDICATION OF INSPECTION STATUS.

10.1 RESPONSIBILITY. It is the responsibility of the Chief Inspector to issue and govern the usage of quality control tags, stamps, and other identifying markings used in the inspection system.

10.1.1 All stamps will be kept in a locked cabinet until issued by the Chief Inspector.

10.1.2 A record of all assigned stamps shall be maintained; the number and to whom issued.

10.1.3 Upon the discontinued use of a stamp, the stamp shall be kept free of use for six months and then re-assigned.

10.1.4 To indicate any rejection marking with a stamp, red ink shall be applied with the stamp by the inspector. Black ink will indicate approval.

10.2 All tags or identifying markings shall be properly identified with the job by use of the customer's name or job number, part number and purchase order number.

11. COORDINATED GOVERNMENT/CONTRACTOR ACTIONS.

11.1 GOVERNMENT INSPECTION AT SUBCONTRACTOR VENDOR FACILITIES. As the government reserves the right to inspect at source, supplies and services not manufactured or performed at HJOL, a statement shall be added to HJOL purchase order when the government does require inspection, the this effect:

> "Government inspection is required prior to shipment from your plant. Upon receipt of this order, promptly notify the Government Representative who normally services your plant so that appropriate planning for Government inspection can be accomplished."

Government inspection does not constitute acceptance nor shall it replace contractors inspection or otherwise relieve the contractor of his responsibility to furnish an acceptable end item.

11.2 When under authorization of the Government Representative, copies of the purchasing documents are to be furnished directly by the subcontractor or vendor to the Government Representative at his facility rather than through Government channels, HJOL shall add to the purchasing document, this statement:

> "On receipt of this order, promptly furnish a copy to the Government Representative who normally services your plant, or, if none to the nearest Army, Navy, Air Force or Defense Supply Agency inspection office. In the event the representative or office cannot be located, our purchasing agent should be notified immediately."

All documents and referenced data for purchases applying to a Government contract shall be available for review by the Government. Copies of purchasing documents required for Government purposes shall be furnished in accordance with the instructions of the Government representative. All nonconforming parts found upon Government source shall require HJOL to coordinate with Government Representatives on corrective action.

12. GOVERNMENT PROPERTY

12.1 GOVERNMENT-FURNISHED MATERIAL. When material is furnished by the Government, the contractor's procedures shall include the following:

12.1.1 Examination upon receipt, consistent with practicability to detect damage in transit.

12.1.2 Inspection for completeness and proper type.

12.1.3 Periodic inspection and precautions to assure adequate storage conditions and to guard against damage from handling and deterioration during storage.

12.1.4 Functional testing, either prior to or after installation, or both, as required by contract to determine satisfactory operation.

12.1.5 Identification and protection from improper use or disposition.

12.1.6 Verification of quantity.

12.2 DAMAGED GOVERNMENT-FURNISHED MATERIAL. HJOL shall report to the Government Representative of Government-furnished material found damaged, malfunctioned, or otherwise unsuitable for use. In the event of damage or malfunction during or after installation, HJOL shall determine and record probable cause and necessity for withholding material from use.

12.3 HJOL shall, as required by the terms of the Bailment Agreement, establish procedures for the adequate storage, maintenance, and inspection of bailed Government property. Records of all inspections and maintenance performed on bailed property shall be maintained and available for review by the Government Representative.

13. THIN FILMS

13.1 TESTING OF COATING BY COATING MANAGER. The coating manager will be responsible that all thin films are applied per MIL-C-00675A or MIL-M-13508C. This shall include visual inspection, spectrophotometer readings, and environmental testing.

13.2 INSPECTION OF TESTING OF COATINGS. The head of inspection shall be responsible that all further testing and inspection be performed in the inspection area.

13.2.1 Aluminized or silvered parts to be subjected to scotch tape test per MIL-M-13508C.

13.2.2 Anti-reflection coating to be subject to procedures of MIL-C-675A.

13.2.3 Single, multilayer, or interference coating to be subjected to procedures of MIL-C-48497.

Harold Johnson Optical Laboratories, Inc.

Factory Equipment

Page 1

1 - Auto-Collimator, Model MRA-50

1 - Auto-Collimator, Davidson 092072-2

1 - Blanchard #11 (20 in. chuck)

1 - Blanchard #11 (18 in. chuck)

1 - Bevel Machine, Novamatic Diamond Edger

4 - Cylinder Lapping Machine, 2 spindle

4 - Cylinder Lapping Machine, 1 spindle

1 - Degreaser, Baron Blakeslee 95-115

1 - Horizontal Centering & Edging Machine

1 – LOH Centromatic Micro CM-2SL

1 - Edger, Bothner 3"

1 - Edger, Kwik-Way Serial #H60744

1 - Generator, LOH Spheromatic 120SL

3 - Grinding/Polishing Machine, Cylinder (1892-1, 1892-2, 1892-3)

1 – Grinding/Polishing Machine, Cylinder

1 - Hand Grinder, Mikroway 12", Serial No. 671

1 - Hand Grinder, Mikroway 12", Serial No. 672

1 - Hand Grinder, Mikroway 18", Serial No. 673

1 - Hand Grinder, Mikroway 18", Serial No. 674

1 - Hand Grinder No. G-3

1 - Hand Grinder No. G-6

1 - Hand Grinder No. G-7

1 - Grinder, Surface Rotary YGS-16RF

1 - Grinder, 2 Spindle Cylinder

1 - Grinder, Automatic (Fine)

1 - Grinder, Automatic (Rough)

1 - Magnetic Chuck #12612

1 - Micro Flat with Cabinet

1 - Micro Flat, 18" x 18" x 3"

1 - Microseparator, Model TSK50M, Serial No. 509268

1 - Mill, Diamond N-632

1 - Mill, Induma Model 70

1 - Mill, Induma Serial No. 2505

1 - Mill, Induma Serial No. 3954

1 - Mill, Supermax YC-1-1/2 VA S/N 101-4565, modified with 6400XYZ
3 axis Servo II basic system (automated)

1 - Mill, Vertical Model V-2

1 - Mill, Vert/Horiz CNC Lagunmatic Model FV-205 S/N 6428-5CN-387
w/ DynaPath Delta 20 Control Station

1 - Mill, Vertical CNC Lagunmatic Model 310 S/N 30713 w/ DynaPath Control

1 - Mill, Vertical CNC Lagunmatic Model 310 S/N 35177 w/ DynaPath Control

1 - Mill, Vertical CNC Lagunmatic Model 310 S/N 37806
w/ DynaPath Delta 1000-32 Control

1 - Mill, Vertical CNC Lagunmatic Model 310 S/N 37654
w/ DynaPath 1000-32G Control S/N 21938

1 - Polishing Machine, Autoflow Serial No. 187

1 - Polishing Machine, Coburn Single Model 601 Serial No. 1481

2 - Polishing Machine, Coburn 2 Spindle Bowl Model 602

1 - Polishing Machine, Coburn 603 DLX #1324

1 - Polishing Machine, Elgin 2-20 Serial No. 12428

1 - Polishing Machine, Schneider Spheroline SLP 120 CNC S2/2

1 - Polishing Machine, Strasbaugh 67-4 #403-8-72

1 - Polishing Machine, Strasbaugh 6UR-6, #375-7-77

1 - Polishing Machine, Strasbaugh 6Y-4 #636-7-77

1 - Polishing Machine, Strasbaugh 6Y4 #408-3-72

1 - Polishing Machine, Strasbaugh 6BK-109-12-72 Lap Master
1 - Polishing Machine, Strasbaugh 6DE-DC-6, 6 Spindle
1 - Polishing Machine, Strasbaugh Variable 6BU
1 - Polishing Machine, Cylinder ROD
1 – Polishing Machine, Cyl/Plano
1 - Polishing Machine, Single Spindle
1 - Polishing Machine, 6 Spindle
1 - Polishing Machine, 8 Spindle
1 - Polishing Machine, 48" Continuous
1 - Optical Polisher, Model 828 D.C.
1 - Rotary Table, Bridgeport #13726
1 - Rotary Table, Ellis 9"
1 - Rotary Table, Ellis 9" #388
1 - Rotary Table, Horizontal 8", Phase II
1 - Saw, Diamond
1 - Saw, Glass with Digital Readout
1 - Sine Plate 5", S.P. 664
1 - Slimline Table TS3000-36-8
1 - Syphon-Hone Cabinet Dry

Harold Johnson Optical Laboratories, Inc.

Inspection Equipment

Page 1

1 - Angle Standard, for rotary table calibration

1 - Auto-Collimator, 15 seconds

1 - Auto-Collimator, 092072-2

1 - Auto-Collimator, Watts .1 second

2 - Auto-Collimator, Model MRA-50

1 - Auto-Collimator, coordinate

1 - Centering Machine, LOH M1, with removable spindle & centering fixture

2 - Dial Indicators

1 - Encoder ROD 800

1 - Envirotech, Environmental Chamber

1 - Interferometer, Twyman

1 - Interferometer, Cylindrical 4", Serial No. 105, Plus Gratings

1 - Interferometer, Plano 5", D309

1 - Interferometer, Plano, D311-102

1 - Lens Bench, LASICO, 1 ¼ Meter, Granite Base

1 - Lens Bench 12', with Collimator plus Anilam mini wizard

1 - Lens Bench, TM36

1 - Microflat, 2' x 3'

1 - Micrometer, Outside Mitutoyo 204-138

40 - Micrometer, Brown & Sharp, Assorted sizes 0 - 12"

2 - Micrometer, Depth

1 - Micrometer, Stage, 1" coordinates

1 - Mu Checker, Mitutoyo 519-104

1 - Optical Tester, Model B

1 - Oven, Fisher

1 - Polarimeter, Model #35

1 - Rotary Table, 12"

1 - Scale, Grams Chaus

1 - Scratch & Dig Sample, 80/60

1 - Scratch & Dig Sample, Set

1 - Summers Laboratories Coating Hardness Tester Kit

1 - Weber 45 degree Angle Gage Block

1 - Weber Gage Blocks, Sets

1 - Video Metrology System w/8X8 Travel

1 - Zygo PTI System Model PTI-KS
3 Transmission Spheres for above F/11, F/7.2, and F/3.3

1 - Zygo GPI-X4 4" Horizontal System

Harold Johnson Optical Laboratories, Inc.

Machine Shop

1 - Band Saw 14" Boice Crane

1 - Compressor, 3 Phase

1 - Drill Press

1 - Lathe, Harihar

1 - Saw, cut off Kalamazoo

1 - Tool Cutter, Penn Sphere

1 - Tool Grinder, Dayton

Harold Johnson Optical Laboratories, Inc.

Coating Equipment

1 - Airco Temescal Power Supply, Model CV 10

1 - Dyn-Optics Optical Monitor, Model 580 D

1 - Dessicator, with 18" stand

1 - The Eddy Company Monitoring Equipment

1 - Laminar Flow Work Station, Airtech Model 1424

1 - Spectrophotometer, Beckman Model UV 5240, Serial No. 4522480

1 - CHA Vacuum System, High Vacuum Model RA1000

Changes

1/28/03 - Added "Video Metrology System w/8X8 Travel" to Inspection Equipment.

1/28/03 - Added "Grinder, Automatic (Fine)" and "Grinder, Automatic (Rough)" to Factory Equipment.

1/28/03 - Deleted "Grinder, 2 Spindle Flat" from Factory Equipment.

9/17/04 – Deleted “Lightpath Technologies” from Material Supplier list

9/17/04 – Added “Naked Optics Corp.” to Material Supplier list

9/24/04 – Deleted “CHA Vacuum System Model SP600” from coating equip.

11/12/04 – Deleted “Spectrophotometer, Beckman Model DK2A” from coating equipment.

11/12/04 – Added “Spectrophotometer, Beckman Model 5270” to coat equip.

8/26/05 – Added “Grinding/Polishing Machine, Cylinder” to factory equip.

8/26/05 – Added “Polishing Machine, Cyl/Plano” to factory equipment

4/26/06 – Changed statement on 2.3 (Records) to “Unless stated differently on the customer purchase order, all inspection records will be on file at HJOL for a minimum of 7 years and will be available for review by the proper representative of the customer.” Was…”All inspection records will be on file at HJOL and will be available for review by the proper representative of the customer.”

4/26/06 – Updated address for Precision Instrument Correction Inc. on Approved Supplier and Process Source for Calibration of Tools.

4/26/06 – Added “LOH Centromatic Micro CM-2SL” to factory equip.

4/26/06 – Deleted “Spectrophotometer, Beckman Model 5270” from coating equipment.

4/26/06 – Added “Spectrophotometer, Beckman Model UV 5240” to coating equipment.

5/17/06 – Added to 3.1: “Drawings and documentation will be on file at HJOL for a minimum of 7 years.”

Annual Reviews

Date	By Whom	Signature