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S.I.C. Codes:

3494- Valve & Pipe Fittings
3491- Industrial Valves
3567- Pumps & Pumping Equipment
3561- Oil Pumps
3563- Air & Gas Compressors

QUALITY MANUAL
Based on ASQC/ANSI ISO 9001-1994
Standard

Controlled Document


- Uncontrolled Copy
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2. Company Scope

The Kraissl Company is a long-time manufacturer of heavy duty simplex and duplex strainers and filters for protecting equipment in pipeline service. Materials of construction include, cast iron, bronze, aluminum, steel, stainless steel, and other special alloys. Our complete line of duplex three-way (6-port) transfer valves was developed specifically for use with two filters, two heat exchangers, two supply tanks or with other dual systems. Positive displacement Oil transfer pumps and rotary air pumps are also our specialties. Models for fuel oil and flammable fluid service bear the  Underwriters Laboratories (U.L.) label. Kraissl strainers are manufactured in accordance with international standard ASTM F-1199. Units can also be furnished to meet Military, Coast Guard, and other specifications where required. All Kraissl products are manufactured in the U.S.A. to assure high quality workmanship and materials at affordable prices. Authorized Kraissl sales representatives and distributors are located in your area to serve your needs. Please refer to our General Bulletin A1803A found in Appendix 5.B for more details.

3. Introduction to Quality Assurance

The purpose of this document is to outline the Quality Policy and Procedures of the Kraissl Co., Inc. It defines both the structure and extensive implementation of our Quality System.

It is our overall purpose to implement and improve this Quality System to better serve our company and its customers. Needs for improvement are routinely evaluated by all members of the Company, with respect to their individual responsibilities. Management develops specific plans for each improvement as required. Improvements are considered for all areas of the business including safety, quality, cost-effectiveness. If you have suggestions about how we can improve our products, services, and processes, please contact us. Thank you for your continued interest and cooperation.

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All our employees participate in this process, and therefore are personally responsible for quality assurance and improvement.

Our suppliers are an integral part of the quality assurance and improvement process.

This combined effectiveness is measured periodically by establishing defined quality objectives, and applying them to every aspect of our business which effects quality.

4.1.1.A Quality Policy

The Kraissl Company has spent over 3 generations developing and producing high quality products at competitive prices. The specific quality of our products is keyed to the selection and application of appropriate engineering standards for evaluation of each product. All our designs are proprietary. In addition to the external engineering standard specifications which are directly applicable, we have created our own internal quality standards to cover the performance aspects of these special designs. A.N.S.I., A.S.M.E., A.P.I., A.S.T.M., U.L. and other standards incorporated into each design involved. The following policy applies to all quality aspects of sales, design, manufacture, purchasing, production, and services provided by the Kraissl Company to all our valued customers:

Our goal is to provide high quality, reliable products, delivered on-time, at competitive prices.

Together we will strive to effectively meet customer needs through quality assurance and improvement activities.

All our employees participate in this process, and therefore are personally responsible for quality assurance and improvement.

Our suppliers are an integral part of the quality assurance and improvement process.

This combined effectiveness is measured periodically by establishing defined quality objectives, and applying them to every aspect of our business which effects quality.

4.1.1.B Corporate Objectives

We are committed to providing the highest level of quality and service possible while meeting all of the company's business objectives. These Quality Objectives are:

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- To meet or exceed the customers needs for products and services in our line.
- To strive for on-time delivery.
- To continuously improve the quality of the products and services provided.

These objectives are met using three critical components:

- **People** represent the strength of Kraissl Co.,Inc. Teams of skilled and trained individuals are assigned at all levels of the organization.
- **Quality** of products and services, including reliability and durability.
- **Servicing** of customer needs to develop long term partnerships with our customers.

This document explains in detail how our Company achieves the goals and objectives stated above.

4.1.2 Company Organization & Responsibilities

The Company is organized into basic functions: Sales, Production/Shop, Supply, Product Technologist, Controller/Administration, Engineering/Design and Management. The Production Shop is further divided into the Machine, Assembly, Basket, and Shipping Departments.

The Organization Chart found in Appendix 5.E (QW 4.1.2.A) shows how all functional areas are staffed, and show responsibilities are delegated. Individual employees are responsible for specific process functions and tasks related to quality as detailed in the Quality Responsibility Assignments List (QP 4.1.2.B), Appendix 5.F.

4.1.3 Management Responsibilities

Our Executive Management is responsible for defining and documenting and implementing the quality policy and objectives for the Company. This Quality Policy supports the organizational goals and objectives of Kraissl Co., Inc. Management is responsible for ensuring that the quality policy is implemented, understood, and maintained by all members of the Company. This includes providing adequate resources such as trained personnel, equipment, and finances. They also define the responsibilities and authorities for all individuals who can affect quality of products or services.

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The Management Representative is responsible for implementing the quality policy. This includes ensuring that a system is developed and implemented to comply with this Quality Manual along with reporting on the performance of the system.

Management reviews the effectiveness of the quality system at defined intervals. Corrective actions are taken if deficiencies are found in the system.

See the Management Review Procedure (QP 4.1.3) found in Appendix 5.D

4.1.4 QUALITY MANAGEMENT

Regardless of which quality aspect is under scrutiny, the key to assuring product acceptability is teamwork, achieved through "partnering" with both our customers and our employees. First, the Engineering and Sales staffs of both our organizations agree on the applicable quality assurance criteria before the product is manufactured. Using their skills and judgment, our production team then proceeds such that these predetermined compliance standards are these goals. We check, and double check each other's work, because we are all a part of the Quality Assurance Team.

4.2 **Quality System**

A four tier documentation structure is defined to implement our Quality Policy. This structure is outlined as follows:

<u>Tier</u>	<u>Documents</u>	<u>Description</u>
# 1	This <u>Quality Manual</u>	Defines the quality policy, objectives and general plan for implementation of the quality system.
#2	Company Wide <u>Procedures</u>	Detailed procedures that describe the implementation plan for specific areas of the quality system.
#3	Work <u>Instructions</u>	Job, product, or customer specific instructions. _____
#4	<u>Records & Data</u>	Records and data maintained to provide for review of the quality system.

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Appropriate plans are made in advance to assure quality. This includes planning ahead for new products and services. This includes identification of equipment training, control plans, feasibility analysis, and any other techniques determined necessary for the proper functioning of the quality system.

See the "Macro" Quality System Flow Chart (QP 4.2) and the Quality Planning Procedure (QP 4.2.3) for details.

Also see the Quality Process Summary in Appendix 5.C, the Quality System Level Procedures List in Appendix 5.D (QP series- References), and the Quality Responsibility Assignments List, Appendix 5.F for details of how these requirements are assigned and implemented.

4.2.A QUALITY STANDARDS

Model 72 Series simplex and duplex strainers and model 60 series pumps for fuel oil and flammable fluid service bear the Underwriters Laboratories (U.L) label.

® Each U.L. listed product incorporates very rugged, U.L. approved designs, and is individually tested in accordance with stringent U.L. quality control procedures. See enclosures (1) and (2). U.L. quality specialists independently inspect our manufacturing procedures on a quarterly schedule to assure adherence to all these technical inspection and test specifications. Kraissl strainers are also manufactured in accordance with the international standard ASTM F1199. Units can be furnished to meet Military, Coast Guard, and other specifications where required. Threaded N.P.T. and A.N.S.I. flanged port units are standard. A detailed reference list of specific A.N.S.I., A.S.T.M., M.S.S., and other engineering standards which apply to our products is found at the end of this discussion. Standard letters of conformance and certified dimension drawings are available upon request to further document this entire quality process. See Appendix 5.A for a listing of reference standards which commonly apply to our products.

4.3 Contract Review

Our Quality System provides for the review of all customer orders (contracts) to ensure that the company is capable of meeting or exceeding the customer's needs while complying with all of the companies business and quality objectives. This includes ensuring that the customers requirements are understood and documented in a controlled manner. In the event that differences arise, they are resolved prior to acceptance of the order. Amendments or changes to customer orders are analyzed and changed in a manner that is acceptable to both ourselves and our customers.

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See the Order Processing and (Contract Review) Procedure (QP 4.3) for details concerning how this requirement is implemented.

4.4 Design Control

Our Engineering/Design Staff conducts a preliminary feasibility analysis prior to acceptance of orders which involve new product designs or services. This includes new product designs, existing design modifications, evaluation of new equipment needs, capacity within all company capabilities quality requirements, specifications, and business objectives. Ambiguous requirements are clarified prior to new design

work. Analysis includes the creation of new product design specifications, established to ensure that the customer's requirements can be met while fitting planning, cost analysis, documentation requirements, etc. Agreement must be reached between the customer and Kraissl Co., Inc. prior to acceptance of such new business.

The Design Control process specifically includes: input definition, output expectations, engineering, design review requirements, design validation, and design verification when so specified.

See the Design Control Procedure (QP 4.4) for details concerning how this requirement is implemented.

4.5 Document and Data Control

Our Quality System provides for the control of documents that can have an affect on quality to the extent necessary to ensure proper functioning of the quality system. This includes this Quality Manual, procedures, work instructions, forms, engineering drawings (both internal and customer supplied), and standardized product price lists.

Document approval is made by authorized personnel before issue. Changes to documents are made by the same function that originally approved them.

A document control system prevents the use of invalid or obsolete documents. Revision status is made available to the work force to ensure that documents in use are current. Documents are available to all necessary locations.

See the Document and Data Control Procedure (QP 4.5) for details concerning the implementation of these requirements.

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4.6 Purchasing

Our Quality System ensures that raw materials, finished parts, supplies, and services that can affect quality purchased from outside sources conform to specified requirements. This is accomplished through the use of Pre-approved suppliers, subcontractors, laboratory examinations/certifications, incoming inspection, and other necessary controls. Formal purchase orders include technical data for quality assurance which are reviewed and approved prior to issue. Purchase, product and verification at vendor's or subcontractor's location is generally not applicable.

See Purchasing Control Procedure (QP 4.6) and the Supplier Qualification Instruction (QW 4.6.2) for details of how these requirements are implemented.

4.7 Control of Customer Supplied Product- Not Applicable

Our Company does not normally handle customer-supplied products or materials.

4.8 Product Identification and Traceability

Our Quality System ensures that product is identifiable at all stages of manufacture, storage, and delivery wherever appropriate. When traceability is a requirement of ourselves, or our customer, controls are put in place to ensure that this requirement is met.

Unique model numbers, part numbers, bills of materials, materials color codes, Shop "Machining Orders" ("M" tickets) and "Assembly Orders" ("A" tickets) and Packing Lists on incoming material are all important controls used to assure quality.

See Product Identification and Traceability/Inspection/Test Summary Procedure (QP 4.8/4.12) for details of how this requirement is implemented.

4.9 Process Control

Our Quality System has identified all processes that have a direct affect on quality. These processes are carried out under controlled conditions including:

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- The use of documented procedures and instructions
- The use of appropriate equipment and working environment
- Conformance with all governmental safety and environmental regulations
- Compliance to specified procedures
- Monitoring of process parameters
- Use of workmanship criteria
- Use of a maintenance system for major equipment
- Periodic assignments of qualified operators, when necessary

As stated in the introduction to this Quality Manual, on-time delivery to customers is an important goal. This is accomplished through the use of production scheduling, operations planning meetings, and effective processing systems.

See the Process Control Procedure (QP 4.9) and specific work instructions for details of how this requirement is implemented.

4.10 Inspection and Testing

Our Quality System calls for rigorous inspections, and test of products to ensure that all design criteria and customer requirements are met. This includes inspection of finished products, along with in-process checks to ensure that the finished product will meet requirements. Incoming raw materials and supplies also inspected to ensure that they meet all requirements. Procedures, instructions and accept/reject criteria are documented to ensure that inspection and testing is carried out properly.

Records of Inspections and Test are maintained to prove that the necessary requirements have been met.

“Urgent Release” of incoming or in-process materials is not authorized.

See the Inspection and Testing Procedure (QP 4.10) for details of how this requirement is implemented.

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4.11 Control of Inspection, Measuring and Test Equipment (I.M.T.E.)

I.M.T.E. used for the verification of product quality is controlled, calibrated and maintained properly to ensure that it is capable of measuring to the required specifications.

Calibration of measuring and test equipment is traceable to the National Institute of Standard and Technology whenever possible. Procedures, acceptance criteria, and frequencies are documented to ensure that equipment is capable of measuring properly. If any equipment is found out of calibration, all previous inspections performed since the last calibration are evaluated for possible action. We determine the acceptable measurement tolerances for each I.M.T.E. measurement tool. This is accomplished through the use of the original equipment and manufacturer's recommended calibration instructions.

See the Control of Inspection, Measuring and Test Equipment Procedure (QP 4.11) for details of how this requirement is implemented.

4.12 Inspection and Test Status

Our Quality System identifies the inspection/test status of all raw materials, materials in process and finished products in our facilities. This is done through the controlled use of packing lists, shop tickets, authorized approvals, and inspection markings. This system is used to ensure that material is not processed until it has gone through the proper stages of inspection or testing.

See the Inspection and Testing Procedure (QP4.8/ 4.12) for details of how this requirement is implemented.

4.13 Control of Nonconforming Materials (NCM)

Our Quality System controls all material that does not conform to specifications to ensure that it is not used until a proper disposition can be made by authorized parties. Any Material that is received with damage or insufficient information for processing is also subject to this procedure.

Nonconforming Material (NCM) is quarantined through the use of nonconforming material tags and segregated holding areas (where practical). Disposition is determined by the corresponding Quality Procedure "Owner" depending on the nonconformity. Any product that is reworked is fully re-inspected after rework to ensure conformance.

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Documentation of nonconforming product is maintained and analyzed.

Instances of nonconforming material are also subject to Corrective and Preventive Action.

See the Control of Nonconforming Material Procedure (QP 4.13) for details of how this requirement is implemented.

4.14 Corrective and Preventive Action

Instances of nonconforming material, customer complaints, breakdowns of the quality system and other problems are investigated and corrected through use of the Corrective and Preventive Action (C/PA) system. Any employee can initiate this procedure by reporting problems on a C/PA Report (C/P.A.R.)

Corrective actions taken for existing nonconformities may include quality import analysis, team problem solving (when appropriate), root cause analysis, short and long term containment measures, and follow-up this approach to ensure that the actions put in place are effective, and that the non-conformity does not occur.

Preventive actions for avoiding problems before they occur may include changes to processes, documentation, training and any other actions that are appropriate to the magnitude of the potential future problem.

See the Corrective and Preventive Action Instruction (QP 4.14.) for details of how this system is implemented.

4.15 Product Handling, Storage, Packaging, Preservation & Delivery

Our Quality System includes proper handling, storage, packaging and preservation of our products in a manner that will prevent damage. The Controls are in place for all processes and individual products to ensure that material quality is maintained.

See the Product Handling, Storage, Packaging, Preservation and Delivery Instruction (QW 4.15) for details of how this system is implemented.

4.16 Control of Quality Records

Records related to quality activities are maintained and protected for predetermined intervals. These records are maintained to show conformance to specified requirements as well as the effective operation of the quality system.

Records are easily retrievable and stored in a way to prevent damage or loss. Filing Record Access, Storage, Maintenance and disposal is the responsibility of the corresponding process owner.

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Quality records may be made available to customers upon their request. See the Quality Records Control Procedure (QP 4.16) along with other individual procedures for details of how this system is implemented, including responsibilities and file retention times.

4.17 Internal Audits

Our Quality System includes the conduct of internal audits of the quality system are conducted to ensure its effectiveness. Periodic audits are conducted a minimum of one time per year at appropriate intervals. The results of these audits are reported to management along with those responsible for the areas being audited. Deficiencies found during audits are corrected through the Corrective and Preventive Action system. See the Internal Audit Procedure (QP 4.17) for details of how this system is implemented.

4.18 Training

Quality System Training is provided to all employees as needed. Additional "position-specific" training needs are identified for positions within the company that have a direct impact on product quality. Personnel are qualified based on training, education, and experience. Records of these qualifications are maintained and used for production decisions. The effectiveness of the training program is periodically evaluated and modified as the need for additional training arises.

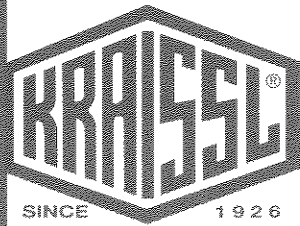
See the Training Procedure (QP 4.18) for details of how this system is implemented.

4.19 Servicing

Repair and Warranty Services are available for all products of our manufacture. See the Returned Products Handling Procedure (4.19.A), Repair Service Procedure (QP 4.19.B) and Warranty Service Procedure (QP 4.19.C) for implementation details.

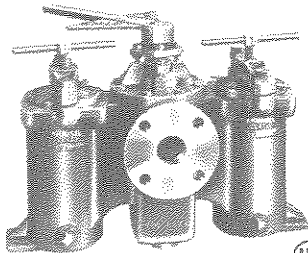
4.20 Statistical Techniques- (Not Applicable)

Statistical Techniques are not normally needed because of the generally small lot sizes of our manufactured parts.



RUGGED CONSTRUCTION

Cast Iron, Steel, Stainless,
Bronze and Other Alloys.
Flanged, Threaded or Weld-End.

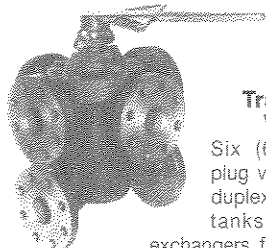
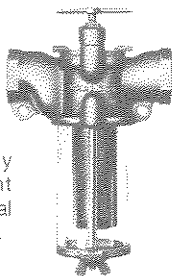


Model 72 Simplex & Duplex Strainers

For fuel oil, lube oil, cooling water or any fluid service. Protects pumps, nozzles, meters, heat exchangers and process lines. High pressure/temperature special designs.

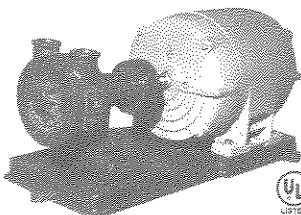
Model 73 Sea-View Strainers Simplex- Duplex

Cast bronze body with transparent sump permits visual inspection of flow.



Model 72AA Transfer Valves

Six (6) port plug valve for duplexing two tanks, heat exchangers, filters, or other systems with minimum piping and space. High pressure/temperature special designs.



Model 60 Pumps

General line of cast iron fuel and lube oil pumps — direct connected for light oils, reduction drives for heavy oils. High temperature special designs.

STRAINERS, FILTERS, TRANSFER VALVES, TRANSFER PUMPS, AIR PUMPS

KRAISSL COMPANY Incorporated

GENERAL BULLETIN A1803A

COMPANY CAPABILITIES

The Kraissl Company is a long-time manufacturer of heavy duty simplex and duplex strainers and filters for protecting equipment in pipeline service. Materials of construction include cast iron, bronze, aluminum, steel, stainless steel, and other special alloys. Our complete line of duplex three-way (6-port) transfer valves was developed specifically for use with two filters, two heat exchangers, two supply tanks or with other dual systems. Positive displacement Oil transfer pumps and rotary air pumps are also our specialties. All Kraissl products are manufactured in the U.S.A. to assure high quality workmanship and materials at affordable prices. Authorized Kraissl sales representatives and distributors are located in your area to serve your needs.

STANDARD PRODUCTS

MODEL 72 SIMPLEX AND DUPLEX STRAINERS AND FILTERS are designed for minimum pressure loss and easy basket accessibility. Cast alloy construction provides both durability and economy. Duplex models include a tapered plug valve with metal-to-metal seat for long life in rough service. Simple one-stroke valve operation allows for continuous flow transfer from one side to the other without interruptions. Duplex types range from 3/4 to 8 inches in pipe size, and simplex up to 12 inches. Cast iron, cast steel, stainless steel and bronze models are stocked in many sizes. Special units can also be manufactured in other alloys. Threaded N.P.T. and A.N.S.I. flanged port units are standard. Butt-weld and socket weld ports are also available. Models for fuel oil and flammable fluid service bear the Underwriters Laboratories (U.L.) label. Kraissl strainers are manufactured in accordance with international standard ASTM F1199. Units can also be furnished to meet Military, Coast Guard, and other specifications where required. Special ports for strainer back-wash and control sensor installations can be provided. Automatic duplex valve actuators and controls are also available.

MODEL 73 SEA-VIEW SIMPLEX AND DUPLEX STRAINERS with transparent plastic sumps and bronze or aluminum bodies are available in pipe sizes up to 4 inches inclusive for low pressure or suction line water service.

Strainer baskets for both the Model 72 and Model 73 series are made of perforated sheet metal, with or without wire mesh liners. Hole openings typically range from .0015 to .375 inches or larger. Patented double-element baskets are available for Model 72 series strainers, providing 30 to 40% more straining area in the same size housing.

TRANSFER VALVES

MODEL 72AA SERIES Transfer (or Diverter) Valves are used to cost effectively duplex two external pieces of flow equipment with the least amount of associated piping and space. Simple one-stroke valve operation allows for continuous transfer of flow without interruption. Sizes 3/4" through 8 inch are commonly available in cast iron, cast steel, and stainless steel. Internal valve plugs are normally provided in cast iron, stainless steel, or bronze. A broad range of screwed (NPT) port and flanged models including A.N.S.I. Class 125 and 150 through Class 1500 are typically stocked. Cast construction and tapered metal-to-metal valve plug and seat provide durability for long-life. Kraissl Transfer Valves have been accepted for many years in accordance with A.P.I. 614 and other standards for lubrication oil systems.

ROTARY POSITIVE DISPLACEMENT LIQUID PUMPS

MODEL 60 SERIES PUMPS are Underwriters Laboratories listed for fuel oil service. They incorporate an internal gear design which provides a wide range of applications. The speed of operation is chosen based on the viscosity and flow rate of the liquid at pumping temperature. These cast iron pumps are found on many fuel oil burner installations. For No.1 through No.6 fuel oils, our reduction belt-drive pump sets can be rearranged to increase or decrease supply requirements simply by changing belts and pulleys only, without changing pumps. For heavy oils with viscosities from 150 SSU to 8000 SSU and above, our reduction drive pumps are suggested with pump speed of approximately 400 RPM. Direct drive pump sets are also available for light oils and fluids where 1200 RPM, 1800 RPM, or other special fixed speeds are appropriate. Standard models are rated for pressures up to 100 psig. Capacities range from 1/2 to 200 gpm with high suction characteristics. Port sizes include 3/8 to 2 inch NPT.

MODEL 54 AND 55 CHECK AND FOOT VALVES are also available for use in associated piping.

ROTARY AIR PUMPS

MODEL 21 cast iron roller pumps and MODEL 25 cast iron vane-type air pumps are available for both vacuum and low pressure air service. Free displacement capacities range from 3/4 to 70 CFM, for vacuums to 28 inches of mercury and pressures to 50 PSIG. Built in, positive lubrication system with oil supply sump is included.



KRAISSEL COMPANY, INC.
QUALITY ASSURANCE PROCESS SUMMARY

1. COMPANY CAPABILITIES

The Kraissl Company is a long-time manufacturer of heavy duty Simplex and Duplex Strainers and Filters for protecting equipment in pipeline service. Our complete line of duplex-three-way (6-port) Transfer Valves was developed specifically for use with two filters, two heat exchangers, two supply tanks or with other dual systems. Materials of construction include cast iron, bronze, aluminum, steel, stainless steel, and other special alloys. Positive displacement Oil transfer pumps and rotary air pumps are also our specialties. All Kraissl products are carefully manufactured in the U.S.A. to assure high quality workmanship and materials at affordable prices. Authorized Kraissl Sales Representatives and distributors are located in your area to serve your needs.

2. BACKGROUND

The Kraissl Company has spent over 3 generations developing and producing high quality products at competitive prices. Quality is literally "designed" into each of our products. The specific quality of individual products is keyed to the selection of appropriate engineering standards for evaluation of each product. All our designs are proprietary. In addition to the external engineering standard specifications which are directly applicable, we have created our own internal quality standards to cover the performance aspects of these special designs. A.N.S.I., A.S.M.E., A.P.I., A.S.T.M., U.L. and other standards are incorporated into each design involved

4.2.A QUALITY STANDARDS

Model 72 Series simplex and duplex strainers and model 60 series pumps for fuel oil and flammable fluid service bear the Underwriters Laboratories (U.L) label. Each U.L. listed product incorporates very rugged, U.L. approved designs, and is individually tested in accordance with stringent U.L. quality control procedures. See enclosures (1) and (2). U.L. quality specialists independently inspect our manufacturing procedures on a quarterly schedule to assure adherence to all these technical inspection and test specifications. Kraissl strainers are also manufactured in accordance with the international standard ASTM F1199. Units can be furnished to meet Military, Coast Guard, and other specifications where required. Special ports for strainer back-wash and control sensor installations can be provided. Threaded N.P.T. and A.N.S.I. flanged port units are standard. Butt-weld and socket weld ports are also available. A detailed reference list of specific A.N.S.I., A.S.T.M., M.S.S., and other engineering standards which apply to our products is found at the end of this discussion. Standard letters of conformance and certified dimension drawings are available upon request to further document this entire quality process.

4.2.A QUALITY MANAGEMENT

Regardless of which quality aspect is under scrutiny, the key to assuring product acceptability is teamwork, achieved through "partnering" with both our customers and our employees. First, the Engineering and Sales staffs of both our organizations agree on the applicable quality assurance criteria before the product is manufactured. Using their skills and judgment, our production team then proceeds such that these predetermined compliance standards are implemented and enforced. Overall, it is the technical expertise and personal responsibility of each person in the quality assurance chain that ultimately result in the successful manufacturing of a high quality unit. Documented Quality specifications and records are key guidelines to their users, combined with positive attitude and common sense on the part of all people concerned. Factory inspections of these products by our customers during any stage of the quality manufacturing process are available at no additional charge, and we encourage them. Thus, we have "built in" an aggressive, intentional program to achieve these goals. We check, and double check each others' work, because we are all a part of the Quality Assurance Team.

5. RAW MATERIAL ACCEPTANCE

Our products are manufactured from sand castings made of steel, stainless steel, iron, bronze, aluminum, and other alloys. These castings are complex shapes, including numerous internal "cored" surfaces. The first step in our quality control procedure is to carefully evaluate the visual acceptability of each one. This is accomplished at time of receipt using the following formal checklist:

CASTING QUALITY CONTROL

- | | |
|--------------------|----------------------|
| --Visual Defects | --Wall Thickness |
| --Basic Dimensions | --Cleanliness |
| --Flanges Parallel | --Markings/Numbers |
| --Core Positions | --Overall Acceptance |

This evaluation is included with the packing list from each shipment, as conducted by the Shop Foreman. Visual quality of casting surfaces are judged using commercial industrial standards. For example, M.S.S.-SP55 is used for inspecting steel castings. Of course, special orders calling for Magnaflux casting tests to MSS-SP53 or x-radiography to MSS-SP54 can be quoted, up front, at the beginning of the job prior to obtaining castings. Specified chemical and physical analysis traceable to the foundry heat for the castings involved can also be provided if arranged for prior to order inception. Foundry suppliers also send us frequent chemical & physical analyses of typical heats to assure their ongoing quality control routine for metallurgy. Non-conforming castings are formally rejected, tagged with a serialized reject tag and returned to the foundry for rework or replacement.

6. MACHINED PART QUALITY CONTROL

All our machined component parts undergo individual scrutiny in the following manner. Each lot of parts is controlled on a serialized job work-order or machining "shop ticket" ("M" ticket), which calls for production of a specific quantity of parts in accordance with a specific machine drawing. After rough machining, the casting is rechecked for overall dimensionality to assure that finish dimensions will be met, and for any subsurface metal anomalies. If any problems arise, the machinist identifies them, informs his supervisor, and the piece is immediately rejected, using a serialized reject tag. The non-conforming piece is removed from the shop floor to a separate location where rejects are separately processed back to the supplier. If necessary, minor "cosmetic" casting flaws are occasionally reworked on-site via weldment and grinding. Any such work as authorized by the foundry supplier is separately accounted for on a special rework ticket ("F" ticket). Castings with major flaws are returned to the foundry for rework or replacement.

When the entire lot of parts is complete, the Machine Group Leader checks out the finished parts against the correct machine drawing for dimensional accuracy, proper surface finish and adequate deburring. He then "clears" that shop ticket by signing his initials and the date to the Quality Control checkoff on the working copy of that ticket. The Foreman then spot checks the parts as well, and adds his initials and date, thus completing that job.

7. ASSEMBLY QUALITY CONTROL

Unit assemblies and subassemblies are also handled on a production lot basis using an Assembly Shop Ticket ("A" ticket) for standard units, and our "Green Sheet"/Customer Order for special assemblies. These documents call out the correct parts which are to be assembled into the finished unit. Prior to assembly, all parts are thoroughly washed to remove dirt or foreign material, and pre-inspected for cleanliness prior to assembly. When assemblies are completed and ready for unit pre-test review, the Assembly Group Leader is called on to conduct this preliminary inspection. The next step includes formal unit inspection and test procedures which follow.

8. FINISHED PRODUCT QUALITY CONTROL

The quality program that stands behind each unit is extensive. Our customers should be specifically aware of the standard Kraissl Company "test tag", or test certificate, which is attached to each of our duplex valves and duplex strainers at time of shipment. See enclosure (3). Each duplex strainer or valve

unit is individually serial numbered, and this number is carried on the test tag as well. This quality checklist is nothing new, and has been the key to our quality assurance program for many years. We believe it to be the only quality control procedure of its kind for these types of products currently available from any source. It allows us to trace the quality control trail, right back to the original date of manufacture, including the production lot, and even the foundry which produced the major body castings. After assembly, each unit is thoroughly washed, performance tested under appropriate hydrostatic pressure, normally 1 1/2 times the maximum rated working pressure, and checked for valve plug seepage rates. See enclosure (4) for our standard test specifications. All sales dimensions are also checked to ensure that they are within production tolerances. If the unit does not comply with any of these criteria, it is rejected, marked as such, and reworked accordingly. Further, the basic test-stand inspection is only the first step.. The unit is subsequently drained of the test fluid, taking with it any foreign particulate matter not originally removed. After successful testing, the complete unit is then washed internally and externally for a third time in a special phosphate chemical wash at approximately 120 degrees F which ensures adhesion of the external paint coating, and helps to inhibit rust. The unit is finally drained, air-dried, coated internally with rust preventative oil, and the ports sealed with plastic port protectors and/or tape. All these quality criteria are double checked by the Assembly Group Leader. Finished units are visually re-checked during shipment preparation by the Shipping Group Leader, and often checked again on a spot basis by the management at any of these Quality Control phases.

9. SUMMARY

We trust that this discussion satisfies your interest in our Quality Assurance Procedures. If questions arise, please contact us for further information. Thank you for the opportunity to work together with you to assure the best quality products, customer satisfaction, and mutual success.

Enclosures: (1) U.L. file #MP1736 certification for Model 72 Simplex and Duplex Strainers & Filters
(2) U.L. File #MP2341 certification for Model 60 Oil Pumps
(3) Kraissl Company Strainer & Valve Test Tag
(4) Kraissl Company Valve Test Standards

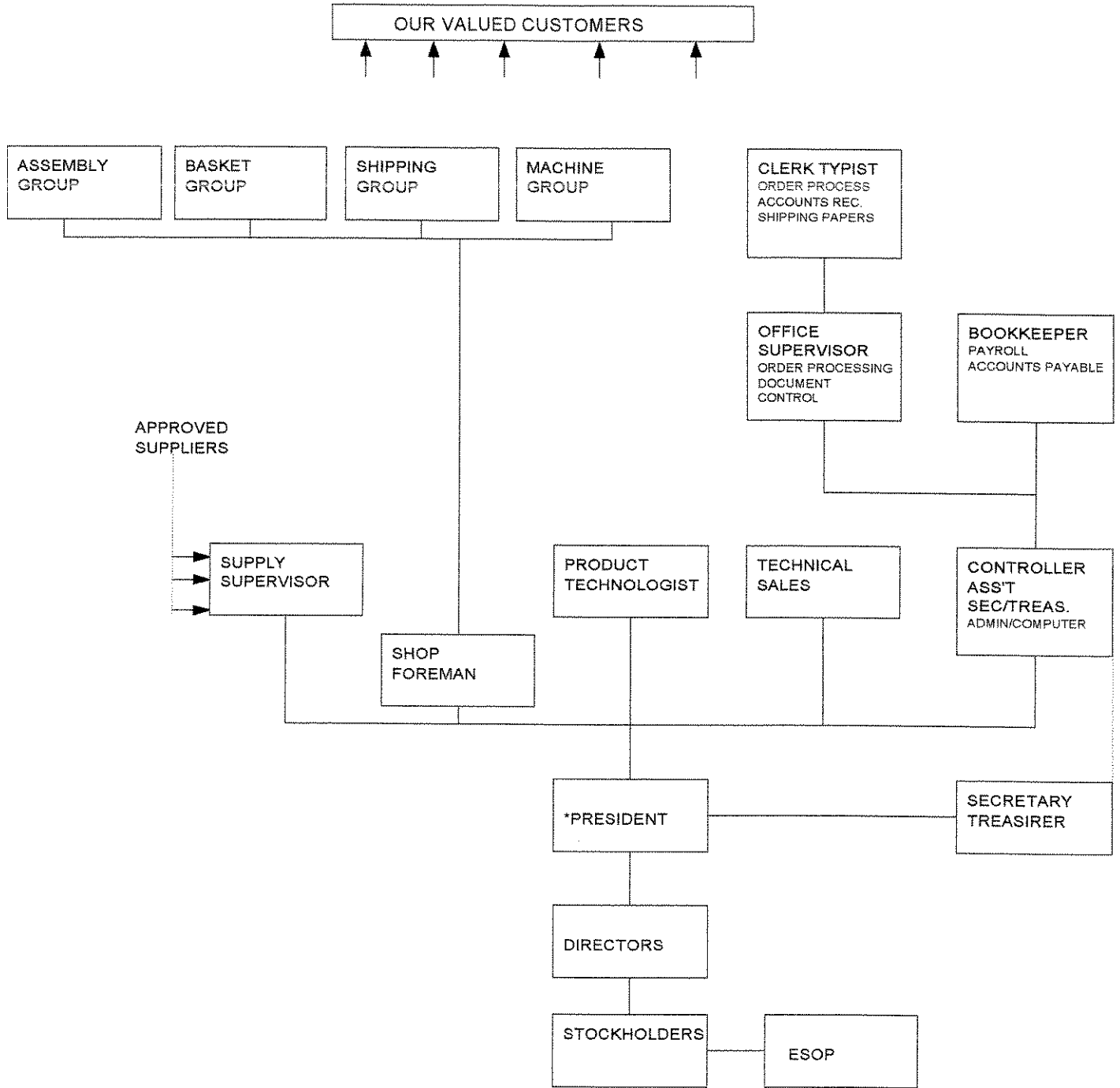
References: ANSI B16.1 (Cast Iron Flanged Fittings)
ANSI B16.24 (Bronze Flanged Fittings)
ANSI B16.5 (Steel Flanged Fittings)
ANSI B16.34 (Valves-Flanged and Butt-weld End)
A.P.I. 614 (Transfer Valves)
ASTM F1199 - "Standard Specification for Cast and Welded Pipeline Strainers"
ASTM Cast metal standard specifications:
ASTM A126 Class B- Cast Iron
ASTM A536- Ductile Iron
ASTM A216 WCB- Carbon Steel
ASTM A351-CF8-304 Stainless Steel
ASTM A351-CF8M- 316 Stainless Steel
ASTM B62- Commercial Bronze
MSS-SP55 (Visual Inspection-Steel)
MSS-SP54 (Radiography)
MSS-SP53 (Magnaflux)
U.L. file #MP2341 Model 60 Oil Pumps
U.L. file #MP1736 Model 72 Simplex & Duplex Strainers & Filters

APPENDIX 5.D KRAISSL CO. INC. QUALITY SYSTEM-LEVEL PROCEDURE LIST

<u>NUMBER</u>	<u>TITLE</u>
QP 4.1.1.A	KRAISSL CO. QUALITY MANAGEMENT POLICY
QP 4.1.2	KRAISSL CO. ORGANIZATION CHART
QP 4.1.3	KRAISSL CO. MANAGEMENT REVIEW PROCEDURE
QP 4.2	KRAISSL CO. "MACRO" QUALITY SYSTEM FLOW CHART
QP 4.2.3	KRAISSL CO. QUALITY PLANNING PROCEDURE
QP 4.3.A	KRAISSL CO. QUOTATION PROCEDURE
QP 4.3.B	KRAISSL CO. ORDER PROCESS PROCEDURE
QP 4.4	KRAISSL CO. DESIGN PROCEDURE
QW 4.4.1-8	KRAISSL CO. DESIGN/PLANNING CONTROL RECORD
QW 4.4.9	KRAISSL CO. DESIGN CHANGE RECORD
QP 4.5	KRAISSL CO. DOCUMENT/DRAWING/REVISION CONTROL PROCEDURE
QP 4.5.3	KRAISSL CO. GUIDE FOR WRITING/MODIFYING A PROCEDURE
QW 4.5.2	KRAISSL CO. CONTROLLED COPY DOCUMENT LOG
QP 4.6	KRAISSL CO. PURCHASE MATERIALS/SERVICES PROCEDURE
QW 4.6.A	KRAISSL CO. APPROVE INVOICE WORK INSTRUCTION
QW 4.6.2	KRAISSL CO. SUPPLIER PRE-QUALIFIED APPROVAL RECORD
QP 4.8/4.12	KRAISSL CO. PRODUCT IDENTIFICATION-TRACEABILITY-INSPECTION-TEST STATUS SUMMARY PROCEDURE
QW 4.8	KRAISSL CO. FINISHED UNIT IDENTIFICATION WORK INSTRUCTION
QW 4.9	KRAISSL CO. MANUFACTURE PRODUCT/PROCESS CONTROL PROCEDURE
QW 4.9.A	KRAISSL CO. MACHINE ANY PART-WORK INSTRUCTION
QW 4.9.B	KRAISSL CO. ASSEMBLE ANY UNIT WORK INSTRUCTION
QP 4.10	KRAISSL CO. INCOMING PURCHASED MATERIALS RECEIVING PROCEDURE
QW 4.10	KRAISSL CO. ASSEMBLED UNIT INSPECTION/ TESTING PROCEDURE
QW 4.10.A	KRAISSL CO. VALVE PLUG SEEPAGE STANDARD
QP 4.11.A	KRAISSL CO. CONTROL OF INSPECTION, MEASURING & TEST EQUIPMENT(I.M.T.E.) PROCEDURE
QP 4.11.B	KRAISSL CO. "BAD" I.M.T.E. (GUAGE) "OUT OF CALIBRATION" PROCEDURE
QW 4.11.A.2	KRAISSL CO. INSPECTION-MEASURING & TEST EQUIPMENT(I.M.T.E.) CONTROL MATRIX
QW 4.11.B	KRAISSL CO. INSTRUMENT CALIBRATION RECORD
QP 4.13	KRAISSL CO. NON-CONFORMING MATERIALS (NCM) PROCEDURE
QP 4.14	KRAISSL CO. CORRECTIVE/PREVENTIVE ACTION PROCEDURE
QW 4.14	KRAISSL CO. CORRECTIVE/PREVENTATIVE ACTION RECORD
QW 4.15	KRAISSL CO. PRODUCT HANDLING, PACKAGING, SHIPPING, PRESERVATION & STORAGE INSTRUCTION
QP 4.16	KRAISSL CO. QUALITY RECORDS CONTROL PROCEDURE
QW 4.16	KRAISSL CO. QUALITY RECORDS CONTROL MAXTRIX
QP 4.17	KRAISSL CO. INTERNAL AUDIT PROCEDURE
QW 4.17.A	KRAISSL CO. INTERNAL AUDIT RECORD
QW 4.17.B	KRAISSL CO. INTERNAL QUALITY AUDIT SCHEDULE FOR THE YEAR
QP 4.18	KRAISSL CO. TRAINING PROCEDURE FLOW CHART
QW 4.18.A	KRAISSL CO. INDIVIDUAL TRAINING RECORD
QW 4.18.B	KRAISSL CO. PERSONNEL GROUP TRAINING RECORD
QP 4.19.A	KRAISSL CO. RETURNED PRODUCT/HANDLING PROCEDURE
QP 4.19.B	KRAISSL CO. REPAIR SERVICE PROCEDURE
QP 4.19.C	KRAISSL CO. WARRANTY SERVICE PROCEDURE



KRAISSL CO. INC.
 ORGANIZATION CHART



*MANAGEMENT REPRESENTATIVE FOR QUALITY

KEY
 LINE AUTHORITY= _____
 FUNCTIONAL INTERFACE= _____

KRAISSL CO. INC.

QUALITY RESPONSIBILITY ASSIGNMENTS

QUALITY PROCEDURE NUMBER	TITLE	OWNERSHIP ASSIGNED TO (POSITION):
QP 4.1.1.A	KRAISSL CO. QUALITY MANAGEMENT POLICY	MANAGEMENT
QP 4.1.2.A	KRAISSL CO. ORGANIZATION CHART	MANAGEMENT
QP 4.1.2.B	KRAISSL CO. QUALITY RESPONSIBILITY ASSIGNMENTS	
QP 4.1.3	KRAISSL CO. MANAGEMENT REVIEW PROCEDURE	MANAGEMENT
QP 4.2	KRAISSL CO. "MACRO" QUALITY SYSTEM FLOW CHART	MANAGEMENT
QP 4.2.3	KRAISSL CO. QUALITY PLANNING PROCEDURE	MANAGEMENT
QP 4.3.A	KRAISSL CO. QUOTATION PROCEDURE	TECH. SALES
QP 4.3.B	KRAISSL CO. ORDER PROCESSING PROCEDURE	TECH. SALES
QP 4.4	KRAISSL CO. DESIGN PROCEDURE	ENGINEER
QW 4.4.1-8	KRAISSL CO. DESIGN/PLANNING CONTROL RECORD	ENGINEER
QW 4.4.9	KRAISSL CO. DESIGN CHANGE RECORD	ENGINEER
QP 4.5	KRAISSL CO. DOCUMENT/DRAWING/REVISION CONTROL PROCEDURE	TECH. SALES
QP 4.5.3	KRAISSL CO. GUIDE FOR WRITING/MODIFYING A PROCEDURE	MANAGEMENT
QP 4.6	KRAISSL CO. PURCHASE MATERIALS/SERVICES PROCEDURE	SUPPLY SUPERVISOR
QW 4.6.2	KRAISSL CO. SUPPLIER PRE-QUALIFIED APPROVAL RECORD	SUPPLY SUPERVISOR
QP 4.8/4.12	KRAISSL CO. PRODUCT IDENTIFICATION-TRACEABILITY-INSPECTION-TEST STATUS SUMMARY PROCEDURE	
		SHOP FOREMAN
QW 4.8	KRAISSL CO. FINISHED UNIT IDENTIFICATION WORK INSTRUCTION	SHOP FOREMAN
		SHOP FOREMAN
QW 4.9	KRAISSL CO. MANUFACTURE PRODUCT/PROCESS CONTROL PROCEDURE	SHOP FOREMAN
QW 4.9.A	KRAISSL CO. MACHINE ANY PART-WORK INSTRUCTION	SHOP FOREMAN
QW 4.9.B	KRAISSL CO. ASSEMBLE ANY UNIT WORK INSTRUCTION	SHOP FOREMAN
QP 4.10.2	KRAISSL CO. INCOMING PURCHASED MATERIALS RECEIVING PROCEDURE	SHOP FOREMAN
QW 4.10.4	KRAISSL CO. ASSEMBLED UNIT TESTING PROCEDURE	SHOP FOREMAN
QP 4.11.A	KRAISSL CO. CONTROL OF INSPECTION, MEASURING & TEST EQUIPMENT(I.M.T.E.) PROCEDURE	SHOP FOREMAN
		SHOP FOREMAN
QP 4.11.B	KRAISSL CO. I.M.T.E. (GUAGE) OUT OF CALIBRATION PROCEDURE	SHOP FOREMAN
		SHOP FOREMAN
QW 4.11.A.2	KRAISSL CO. INSPECTION & TEST EQUIPMENT(I.M.T.E.) CONTROL MATRIX	SHOP FOREMAN
		SHOP FOREMAN
QP 4.13	KRAISSL CO. NON-CONFORMING MATERIALS (NCM) PROCEDURE	SHOP FOREMAN
		SHOP FOREMAN
QP 4.14	KRAISSL CO. CORRECTIVE/PREVENTIVE ACTION PROCEDURE	PROD. TECH.
		PROD. TECH.
QW 4.14	KRAISSL CO. CORRECTIVE/PREVENTATIVE ACTION RECORD	PROD. TECH.
		PROD. TECH.
QW 4.15	KRAISSL CO. PRODUCT PACKAGING, SHIPPING & STORAGE INSTRUCTION	SHOP FOREMAN
		SHOP FOREMAN

QP 4.16	KRAISSL CO. QUALITY RECORDS CONTROL PROCEDURE	OFFICE SUPERVISOR
QW 4.16	KRAISSL CO. QUALITY RECORDS CONTROL MAXTRIX	OFFICE SUPERVISOR
QP 4.17	KRAISSL CO. INTERNAL AUDIT PROCEDURE	CONTROLLER
QW 4.17.A	KRAISSL CO. INTERNAL AUDIT RECORD	CONTROLLER
QW 4.17.B	KRAISSL CO. INTERNAL QUALITY AUDIT SCHEDULE FOR THE YEAR	CONTROLLER
QP 4.18	KRAISSL CO. TRAINING PROCEDURE FLOW CHART	OFFICE SUPERVISOR
QW 4.18.A	KRAISSL CO. INDIVIDUAL TRAINING RECORD	OFFICE SUPERVISOR
QW 4.18.B	KRAISSL CO. PERSONNEL GROUP TRAINING RECORD	OFFICE SUPERVISOR
QP 4.19.A	KRAISSL CO. RETURNED PRODUCT/HANDLING PROCEDURE	PROD. TECH.
QP 4.19.B	KRAISSL CO. REPAIR SERVICE PROCEDURE	PROD. TECH.
QP 4.19.C	KRAISSL CO. WARRANTY SERVICE PROCEDURE	PROD. TECH.

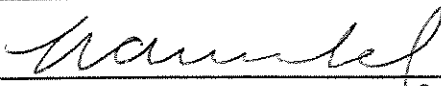
APPENDIX 5.F
QP 4.1.2.B

QUALITY MANUAL

APPENDIX: 5. G. Record of Approval & Revisions

Revision#	Date	Description of changes

Approval

Approved By:	RICHARD C. MICHEL RE. - PRES.
Approval Signature & Date	 2/5/98
Prepared By:	BARBARA PUNTA SECCA
Effective Date:	2/5/98