[redacted] FILM PROCESSOR [redacted]

SCOPE

This specification covers an automatic, self-threading photographic processor capable of processing various black-and-white negative and positive films at speeds between 2 and 15 feet per minute. The processor shall be capable of processing materials in the following sizes:

Sheet film - all sizes from 4x5 inches through 11x14 inches

Camera roll film - all normal camera sizes

Continuous length roll rilm - all widths from 16mm to 9½ inches wide in any length that can be accommodated in an A-9 magazine or [redacted] processing magazines.

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NOTE: No more than 5 inches of leader will be permitted as a requirement for threading any of the above products into or through the processor.

OPERATOR REQUIREMENT

The processor shall be designed to permit a single operator to fulfill all requirements during processing operations.

The designed operator shall not require specialized training, but shall be capable of operating the machine with a minimum amount of orientation instruction. Special knowledge of photographic processing, etc, shall not be required.

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SIZE AND WEIGHT

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The basic processor shall not exceed 37 7/8 inches in length, 25 3/8 inches in width and 52 3/16 inches in height. Adapters to provide for horizontal feed and takeup shall not exceed 30 inches in length. The processor shall be capable of accommodating the [redacted] magazine adapter for vertical feed. When these vertical feed adapters are used, the height of the processor shall not exceed 62 inches. Maximum weight without solutions shall not exceed 600 pounds.

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No more than 6½ square feet of floor space shall be required for installation of the processor, although additional space may be utilized for floor-mounted thirty-gallon replenisher storage tanks. For operation and servicing of the processor, space requirements shall not exceed two feet on the control side and both ends of the processor.

OPERATIONAL REQUIREMENTS

The processor shall be designed so as to be capable of handling sheet film with no more than 13 inches consisting of the feed tray in the darkroom. The remainder of the machine shall be in normal room light.

By the addition of accessory devices the machine shall be capable of processing roll film. The processor shall accept the following roll film accessories:

STATINTL 1. [redacted] Roll Feed Adapter and Roll Take-up Adapter for end loading and take-up. With these accessories the feed end of the Processor must be installed in a darkroom.

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STATINTL 2. [redacted] Roll Feed and Take-up Adapters providing room light operation for the entire machine by use of the [redacted]

STATINTL [redacted] or A-9 Processing Magazine.

STATINTL 3. A top loading and take-up accessory using modified [redacted]

STATINTL [redacted] magazines for daylight operation where space prevents use of end loading or take-up accessories.

In either mode of operation the processor shall be capable of producing uniform development across the entire length and width of sensitized material so as to meet or exceed good commercial standards in all respects.

The output material shall be free from processor produced mottle, streaking, development bars, water spots, etc, and show no evidence of surface abrasion, digs, scratches, reticulation, etc. All output material shall be capable of being handled without damage following the drying stage.

COMPONENT REQUIREMENTS

The processor shall consist of a self-threading film transport system for the processing and drying sections, a developer-recirculation temperature-control system, developer and fixer replenishment systems, tempered and metered wash-water system, dryer controls connected and integrated so as to form a complete, self-contained processing unit.

The processor shall contain a minimum of four stainless steel tanks to accommodate one stage for developer, two stages for fixer, and one for wash-water.

FILM TRANSPORT SYSTEM

The film transport system shall consist of automatic self-threading mechanisms which will transport the sensitized materials from the film feed section, through the processing and drying sections to the take-up section. The transport system shall be designed to provide smooth, positive transport and straight tracking of all sensitized materials at all machine speeds. The design shall permit either wider or narrower film sizes to follow each other through the processor with no tracking difficulty and with no special attention by the operator.

The processor shall successfully transport continuous roll film in multiple strands, i.e., three strands of 16 or 35mm fil, two strands of 70mm film, or two strands of 5-inch film. Furthermore, it shall be possible to transport simultaneously, films of different widths, within the space limitations of the processing cassette.

PROCESSING SYSTEM

Quantities of developer, fixer, and wash water shall be sufficient to accommodate a processing rate of 8 feet per minute with a film such as Type 5401 -- STATINTL Plus-X Aerographic Film and maintain, as a minimum, good commercial standards.

The agitation level attained at 15 feet per minute (+1 foot per minute) shall equal or exceed that provided by intimate contact with rollers at a frequency of 100 applications per minute.

The developer solution shall be thermostatically controlled within $\pm\frac{1}{2}$ F of a manually preset temperature between 70 F and 90 F in an ambient temperature not more than 10 F above operating temperatures.

To meet the above requirement, availability of water at least 5 degrees below operating temperature may be assumed.

The developer shall be continuously recirculated through a filter having a replaceable cartridge.

Arrangements shall be provided for automatic replenishment of developing and fixing solutions during processing in proportion to the length of film processed. The rate of replenishment shall be controlled in accordance with the type, size and amount of film being processed and the film transport speed. Flowmeters shall be provided to give convenient visual evidence of the rate and time of replenishment.

The fixer shall be capable of being maintained at an equilibrium temperature approximating that of the developer.

Each processing tank shall have a separate drain of not less than one-half inch IPS operated by a readily accessible manually operated dump valve. An overflow tray shall be provided to collect excess solution from each tank and convey it to an appropriate drain.

All solution tanks shall be constructed of Type 316 stainless steel, while the processor frame and housing shall be of Type 302 stainless or equivalent. Wherever possible, all other components shall be fabricated of corrosion resistant materials, such as Type 302 stainless steel or suitable plastics. In addition, all stainless steel splash areas are protected with an Epoxy based, baked enamel coating.

All exposed moving parts such as chains, belts, and gears shall be properly guarded for protection of the operator.

Access panels shall be provided which shall be readily removable to provide easy access to the machine components.

MAIN DRIVE SYSTEM

The main drive motor shall be of a capacity sufficient to operate the processor continuously at all speeds from 2 to 15 feet per minute. The drive unit shall be a variable speed type complete with tachometer, transport speed meter, and speed controls located so as to be operated by personnel even under darkroom conditions.

The tachometer shall consist of an electric generator coupled to the drive motor or a suitable driven shaft.

The speed indicator shall be of the direct reading type calibrated with the tachometer to measure the film transport speed in feet per minute. The dial of the speed indicator shall be illuminated to permit reading in darkroom conditions.

FILM SUPPLY SECTION

The processor shall be designed to accept either sheet film or roll film at the film supply section.

For sheet film and for camera roll film in short lengths, the processor shall be designed to accept attachments or devices suitable for guiding the film into the film transport mechanism so that the material being processed will be in line with the axis of the transport system.

plastic of not less than 1½ inch IPS, which will permit connection to a floor drain, or by hose to some other appropriate drain.

CONTROL SYSTEM

The electrical control panel shall be mounted on the operating or feed end of the processor and shall include at least the following:

1. Main drive switch
2. Replenisher pump switch
3. Developer recirculation switch
4. Dryer fan and heater switch
5. Film transport speed indicator
6. Control for film transport speed

Thermometers, replenisher flow indicators, and wash water temperature regulators may be mounted on the feed or dryer end of the processor in positions which are convenient both to the source of their functions and for easy readability by the operators.

Solution thermometers used in the processor design shall be accurate to ±1 F.

RADIO NOISE SUPPRESSION (Electro Magnetic Interference Test)

STATINTL The Processor STATINTL shall conform with military spec No. MIL-I-16910A in the same manner as the STATINTL Film Processor

ELECTRICAL REQUIREMENTS

All electric wiring of the processor shall conform to standards of the Underwriters Laboratories. Wiring shall be in suitable conduits or otherwise protected from splashed or dripping chemical solutions to prevent damage to the equipment or danger to operating personnel. Electrical wiring of the processor shall be coded to permit electrical tracing.

STATINTL The electrical power supply required by the processor shall be 230 volts, 3 phase 3 wire, 60 cycle. It shall include a transformer to facilitate the operation of the 115 volt components.

STATINTL The electrical power for the Processor shall be 115/208 volts, 60 cycle, 3 phase 4 wire.

The fixer section shall be equipped with an overflow line to permit connection to an existing silver recovery section.

The wash system shall be sufficient to attain a hypo content in the processed film which will meet good commercial standards with negative and positive black-and-white films.

The wash water temperature shall be controlled by a thermostatic mixing valve, which shall be capable of maintaining the manually preset temperature to within ±2 F. Wash water flow rate shall be controlled automatically to provide a uniform flow of approximately 2 gallons per minute with pressure variations between 45 and 75 pounds per square inch.

The dryer section shall be an integral part of the processor through which the film shall be automatically transported. Drying rates shall be adjustable by variation in temperature to compensate for different processor speeds.

Air shall be discharged by means of an exhaust vent which may be connected to an exhaust duct to carry the moisture-laden air out of the room.

In the processing section means shall be provided to minimize the amount of solution carried by the film from one tank to the next and to eliminate excess surface water prior to drying.

All methods used to prevent carry-over of solutions or removal of excess moisture shall be designed to prevent streaks, scratches, digs or other abrasions in the sensitized materials.

TAKE-UP SECTION

For operation with sheet film, a suitable bin or collection device shall be provided to accumulate all sizes of sheet film specified herein from 4x5 inches through 11x14 inches as it emerges from the dryer section of the machine.

For operation with roll film, a suitable windup mechanism shall be provided which can be readily attached or removed without special tools or equipment. This windup mechanism shall take up a continuous single roll or multiple rolls of film in smaller sizes. The mechanism shall provide sufficient tension to wind the film snugly without causing damage to the film.

DRAINS AND SUMPS

The drain from each processing tank shall flow into a common sump into which the used wash water will also drain. The drain line from this sump shall be of corrosion resistant steel or

The total electrical load required to operate the processor shall not exceed 12 kilowatts.

SIGNAL DEVICES

Audible signals shall be provided to indicate:

1. Two thicknesses of film accidentally fed into the processor.

2. Film feed timing.

INSTRUCTION MANUAL

Each processor shall be accompanied by an instruction manual which will provide instructions for installation and operation; it will also contain wiring diagrams.

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