

someone was thinking of YOU





a trip through
REXDALE PLANT

the world's most modern TV picture tube producer



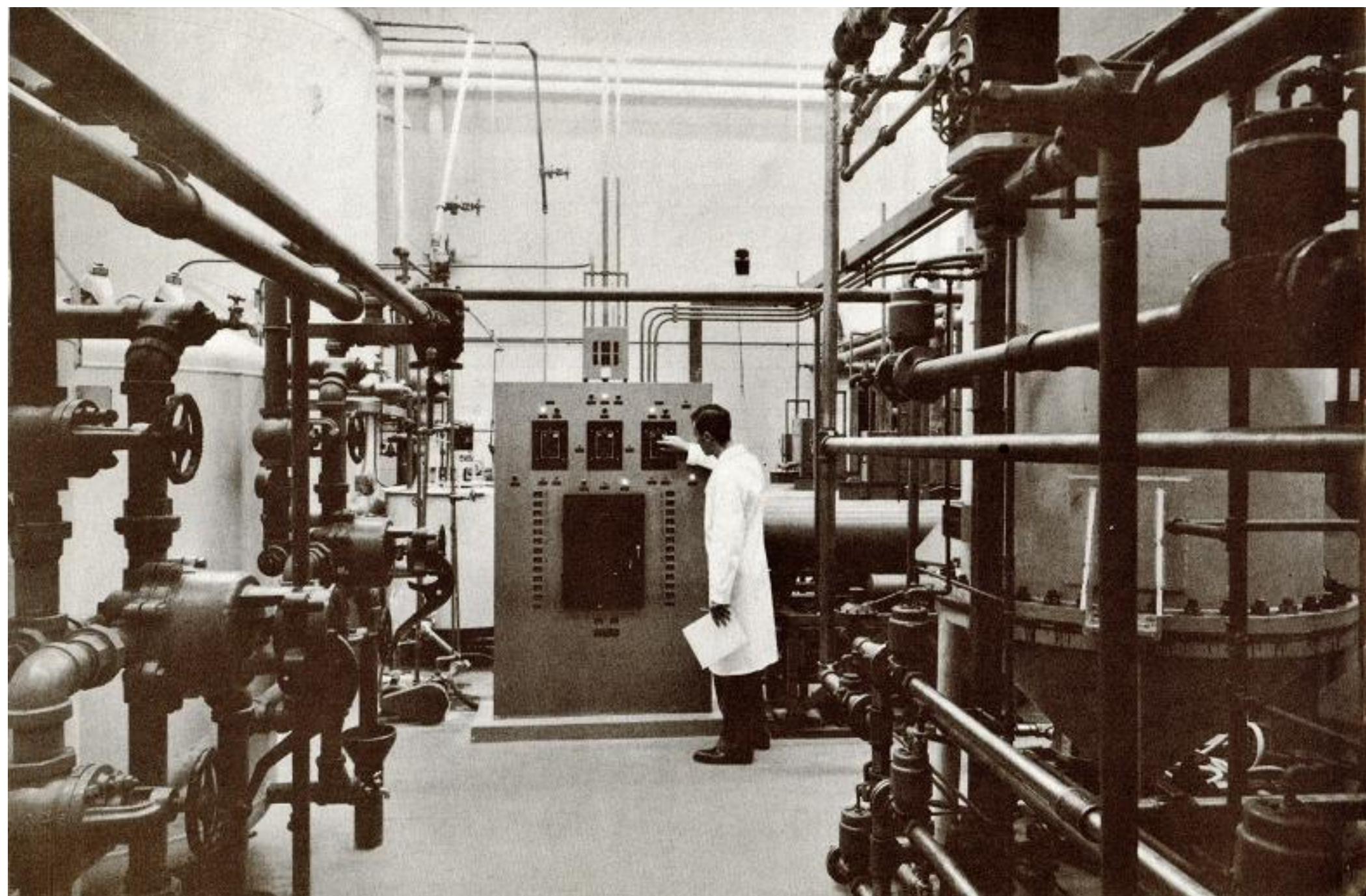
Since the introduction of television a few short years ago, the TV picture has improved from a dim, flickering presentation to a bright, clear, almost mirror-like reproduction. To a large extent, this improvement has been due to great strides which have been made in the design and manufacture of the picture tube itself, and for this reason, a great deal of the popularity and success which the television industry, as a whole, enjoys today can be attributed to the extremely high quality of present day picture tubes.

This booklet tells how particularly fine picture tubes are produced for you at Rexdale, Ontario by Canadian General Electric Co. Ltd. Completed in 1956, the Rexdale plant incorporates the latest available equipment and produces picture tubes in the most extensively automated, quality guarded manner yet to be put into practice in North America. The picture tubes produced are of such high quality and uniformity that most Canadian manufacturers purchase and install them in new TV sets. So many in fact, that today more picture tubes produced by C.G.E. are found in new TV sets than any other make.



BLACK-DAYLITE
PICTURE TUBES





the water in your TV picture tube

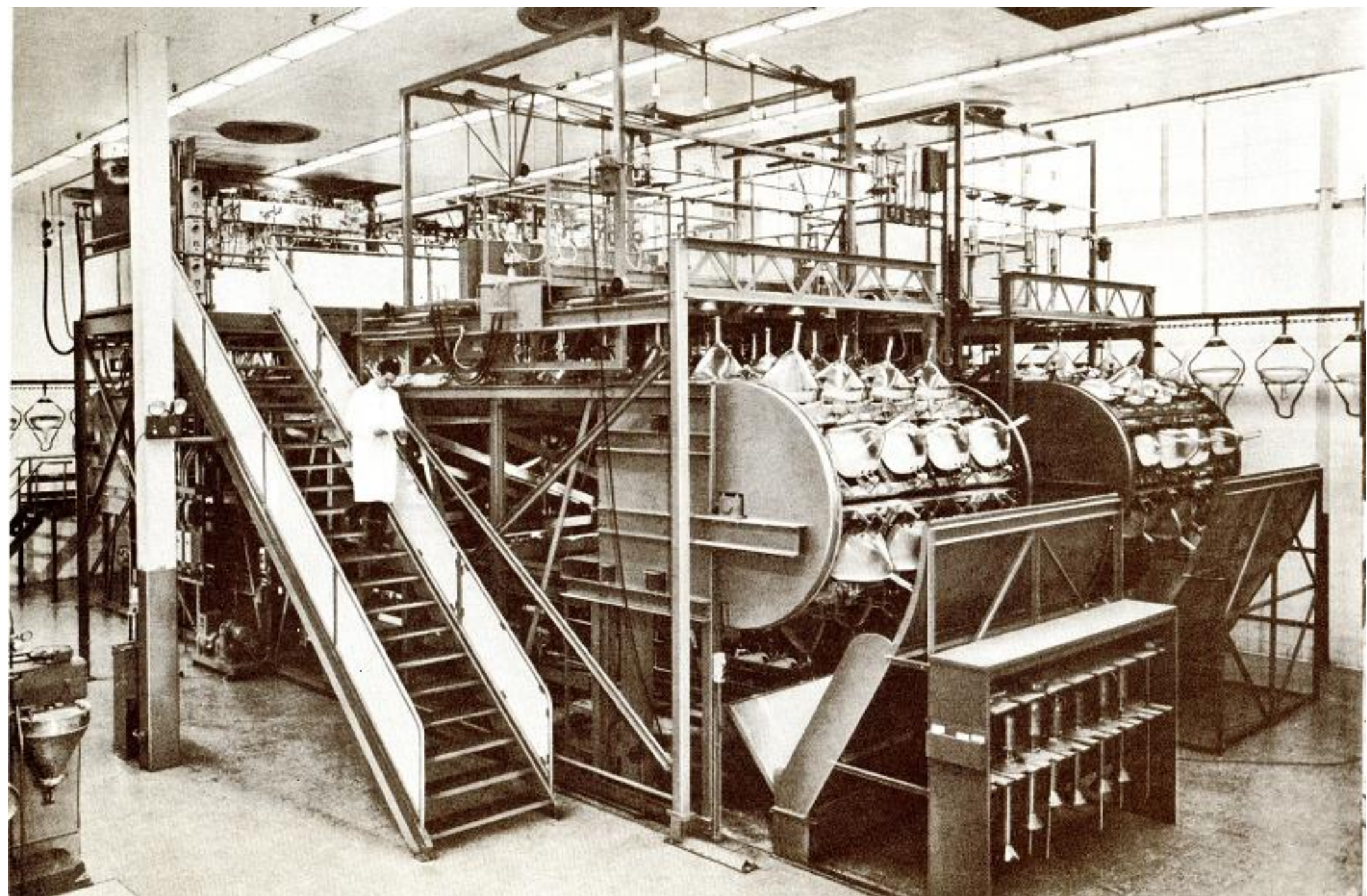
A TV picture tube faceplate has two coatings inside it. One, a fluorescent screen, traps energy-carrying electrons and converts their energy into light that creates the picture. The other, an aluminum mirror directly behind the screen, makes the picture brighter and more distinct.

Both screen and mirror are built into a picture tube by a process which involves water. If the water contained the slightest impurities, the screen would be contaminated . . . spots and other imperfections would appear. Rexdale uses extremely pure process water.

The elaborate water conditioning plant is automatic because manual control could not possibly maintain the required high standard of purity.

The heart of this \$120,000 system, the electronic control and testing panel, is shown on the left.





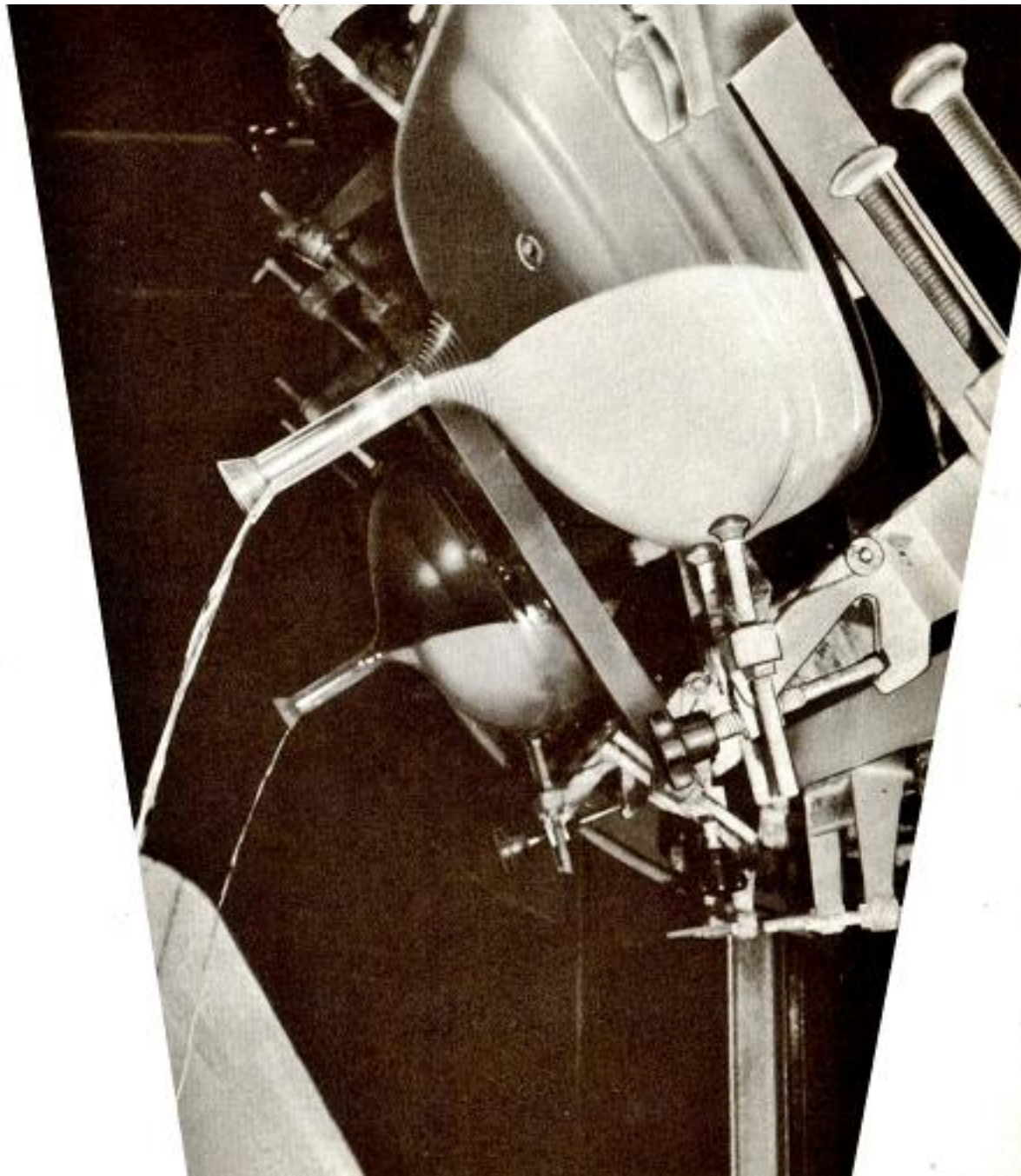
the screening room

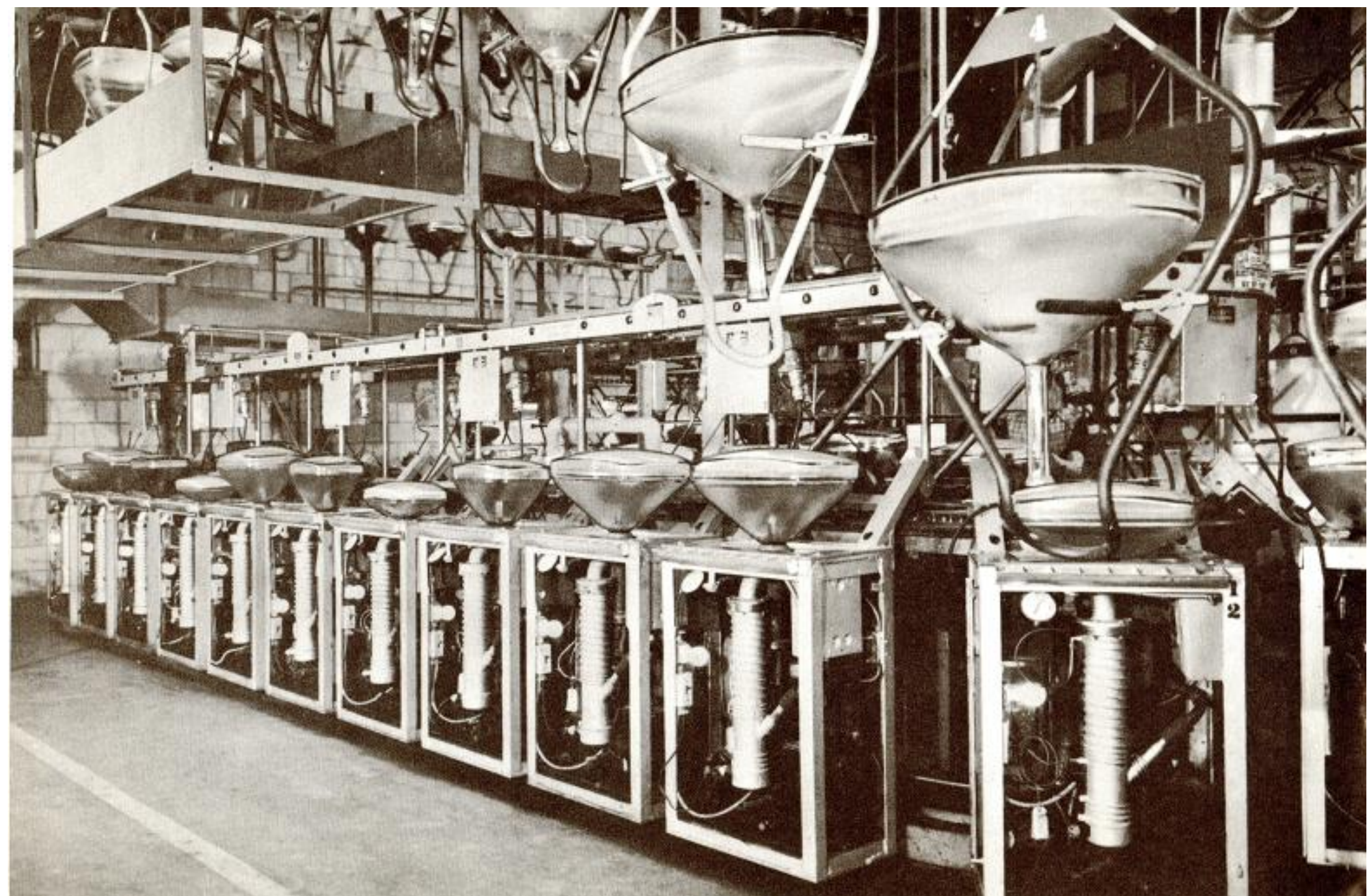
In addition to extremely pure water, complete freedom from vibration is required to place the fluorescent screen inside a picture tube. The slightest movement or shock can ruin the entire screen.

At Rexdale, the screening room is atmospherically and physically separated from the rest of the plant. Fully air conditioned, dust-and lint-free, its walls do not touch the main plant. It rests on a special, floating, sand foundation which absorbs all tremors caused by trucks and trains passing several hundred yards away.

In addition, the giant screening machines are of the very latest design. They are completely automatic for absolute uniformity. Chemical and water dispensing equipment is of corrosion-proof stainless steel or plastic. Conveyors move at a slow, steady vibration-free 9" per minute.

Everything possible has been done to ensure that all conditions are present for perfect screen formation.





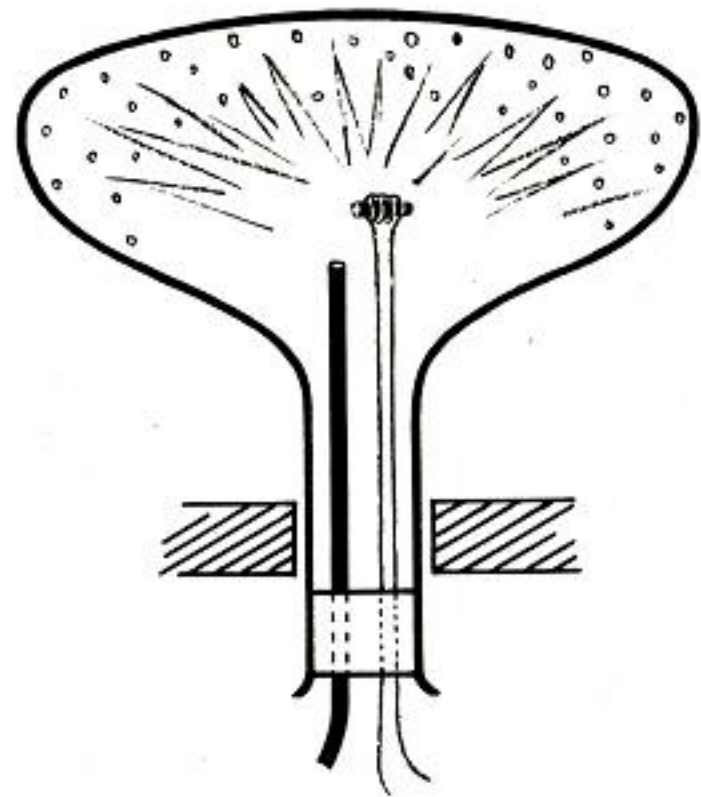
a mirror 50-millionths of an inch thick

Inserting a thin aluminum mirror down the neck of the tube poses a problem that makes placing ship models inside bottles seem fairly simple.

The answer to the problem is a "vaporization."

The tube is placed on a conveyor-mounted stand consisting of a vacuum pump and high-temperature heating element. The heating coil with a small aluminum pellet (inside it) is inserted into the tube along with the vacuum intake-pipe. When a vacuum of 10 billionths of an atmosphere is attained, the heating coil is automatically energized. The pellet vaporizes, the aluminum vapour then condenses onto the cold fluorescent screen.

The result is a perfect mirror that conforms exactly to the contours of the screen and very nearly doubles the brilliance of the TV picture.





how to "bake" a TV picture tube

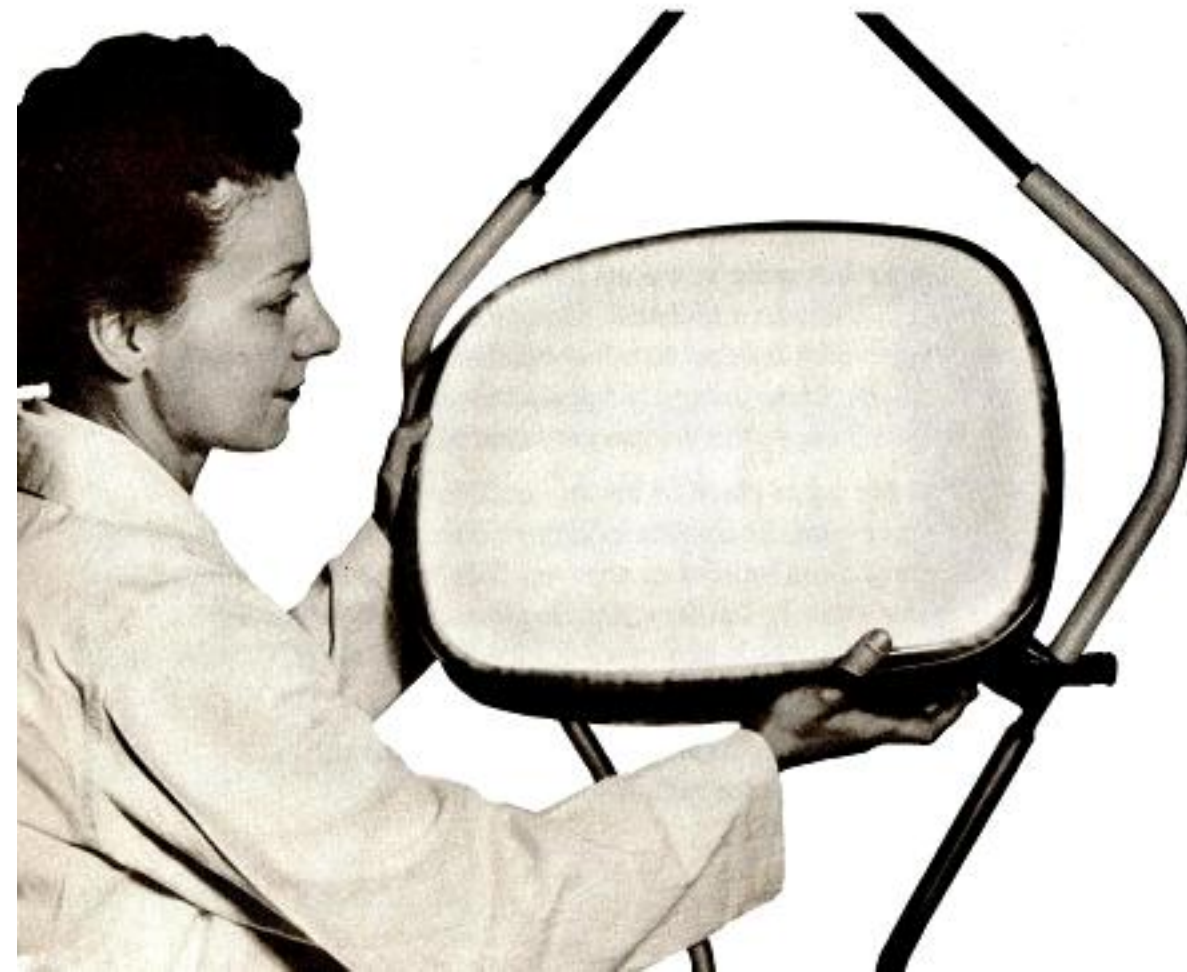
In the raw state, screen and mirror are fragile and unstable. They have to be heat-cured.

The baking process used at Rexdale takes 2½ hours. Each tube is gradually raised to the curing temperature of 800° Fahrenheit, then just as gradually cooled.

The length of the process is vital. If temperature were changed too quickly, the glass would become internally stressed. A dangerous, easily broken tube would result.

The Rexdale plant has two "baking" ovens, shown on the left . . . each 115 feet long.

After curing, each tube is excited with an ultra-violet light for visual inspection to make sure that the screen is perfect. The slightest suspicion of an imperfection is cause for rejection.





the electron gun

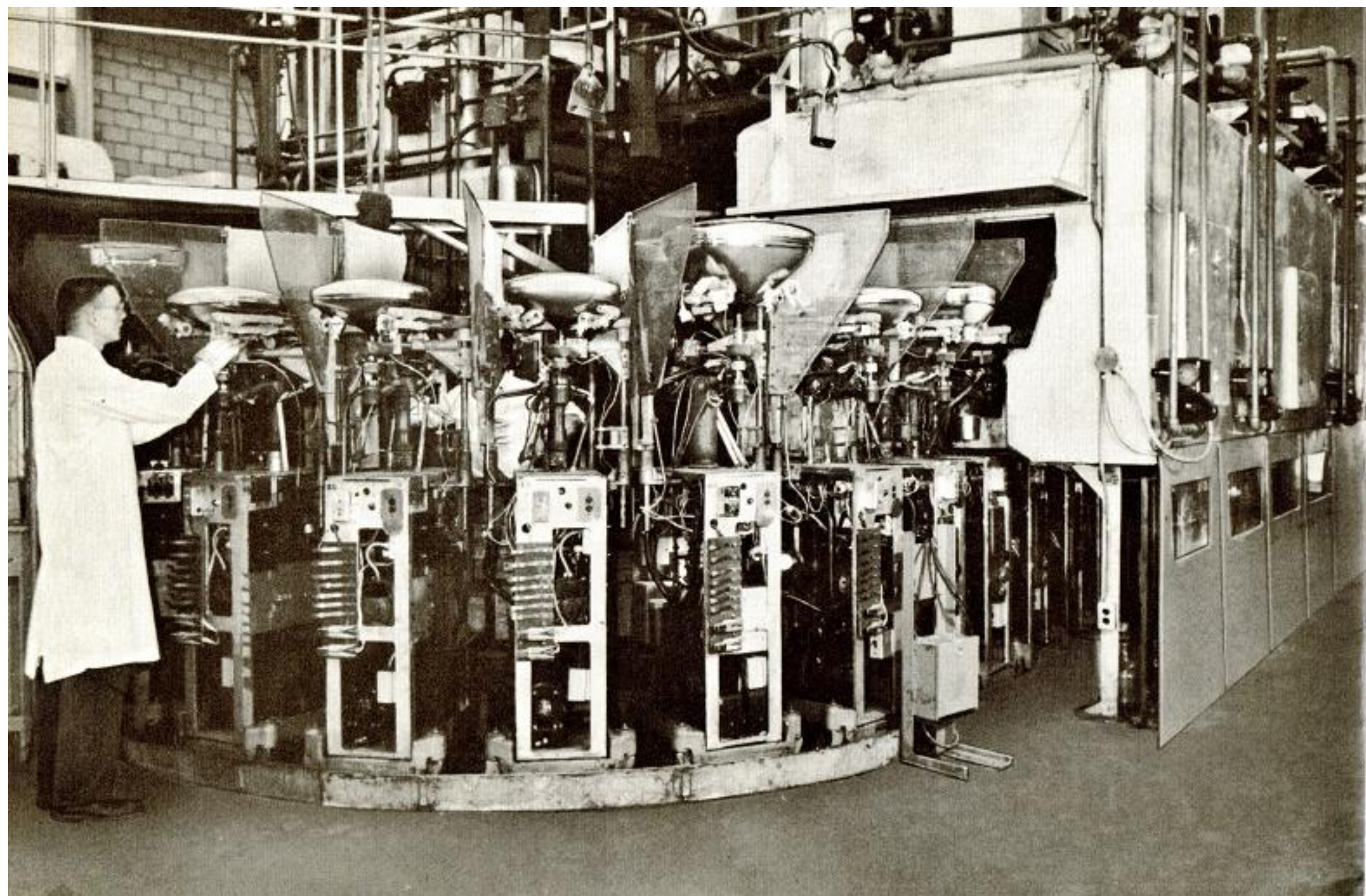
The electron gun is mounted in the neck of the tube and sprays a stream of electrons onto the screen. Its operation is synchronized with a television camera and it reproduces what the camera "sees."

There are a number of completely assembled guns available but none come up to the Rexdale standard. Instead, Canadian General Electric assembles its own guns from the very best materials available. After a scrupulous inspection, those parts not rejected are assembled to produce what are believed to be the very best electron guns.

Assembly takes place in an air conditioned, dust and lint-free room. Each gun receives a thorough check and final cleaning. From then on they are handled only by persons wearing lint-free, nylon gloves. This prevents finger prints which can cause faulty gun operation.

After assembly, the gun is fused into the tube neck by a fully automatic flame process which produces a uniform, accurate match—every time.





tip-off is the sealing of a tube from atmosphere.
Before this can be done, the tube must be completely evacuated.

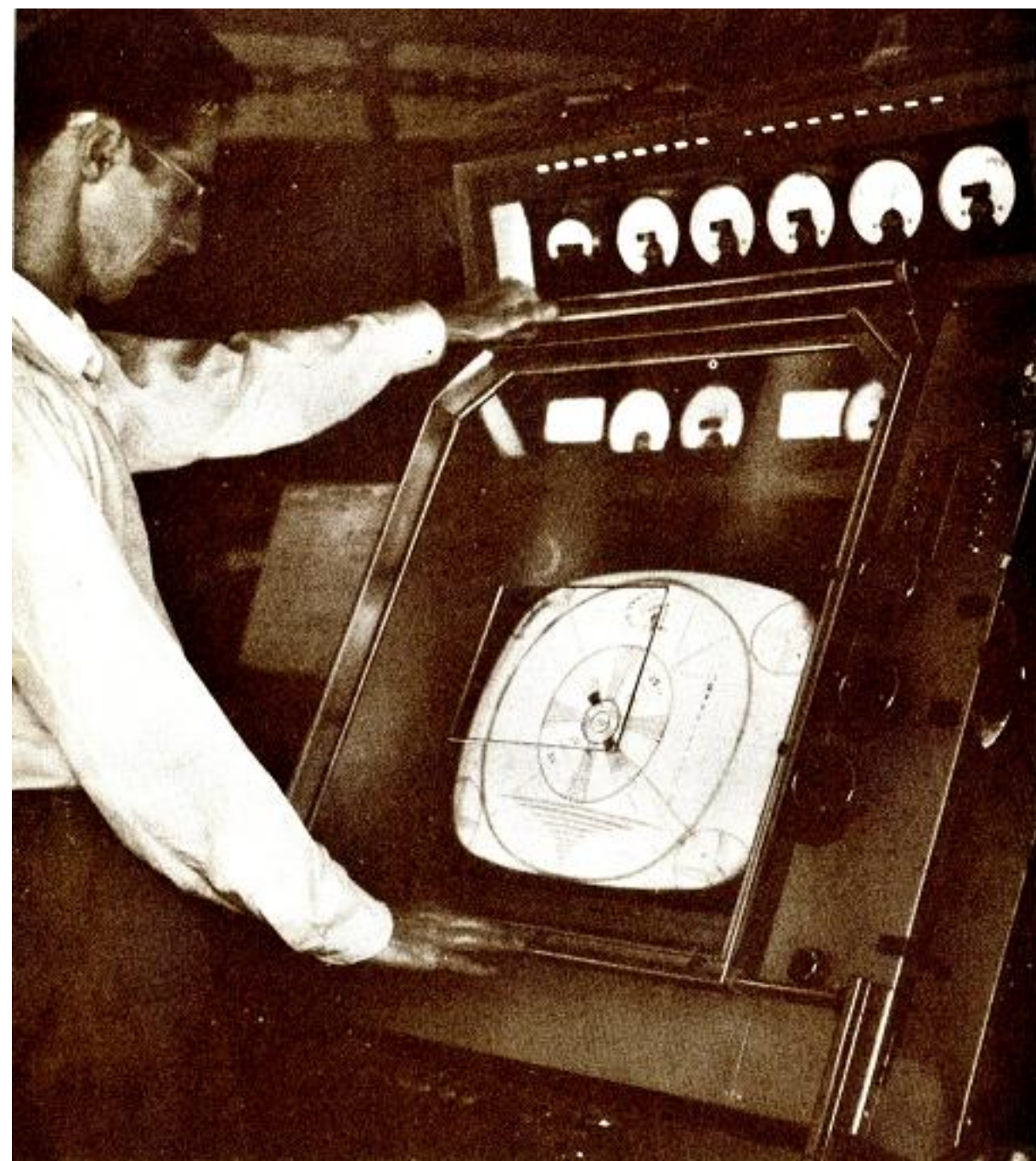
Another conveyor-mounted vacuum pump carries the tube into an oven. The combination of high temperature and the suction of the pump creates a vacuum of one-billionth of an atmosphere. The tube is then heat-sealed. Again heating and cooling take place gradually over a 2½ hour period to prevent stress.

sparking is a 60-110,000 volt charge placed on the gun cathode. This literally knocks the rough edges off and burns away any faint traces of corrosion and impurities.

gettering is the vaporizing of a tiny speck of active chemical put into the tube, along with the gun. The vapour absorbs minute particles of gaseous impurities before it condenses out on the tube walls. Gettering increases the tube vacuum to one ten-billionth of an atmosphere—very nearly perfect.

aging is a 2½ hour period during which each tube is operated at a much higher voltage than it ever receives in normal use.



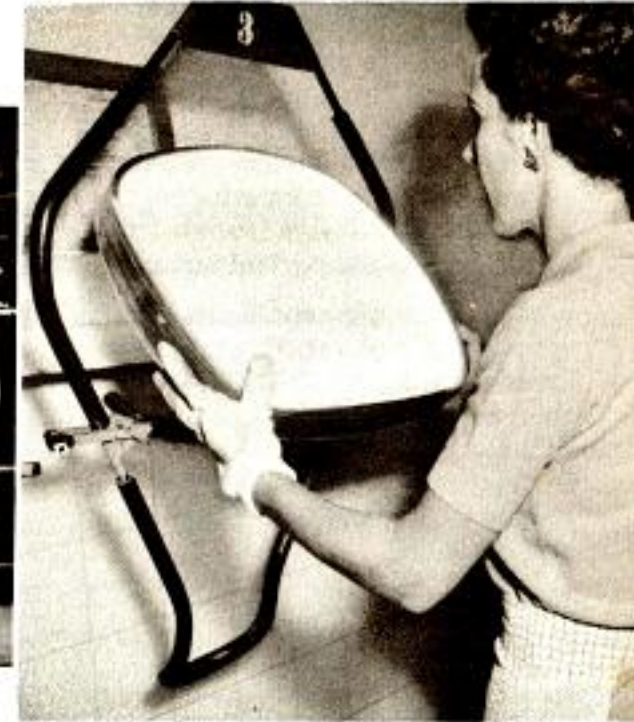
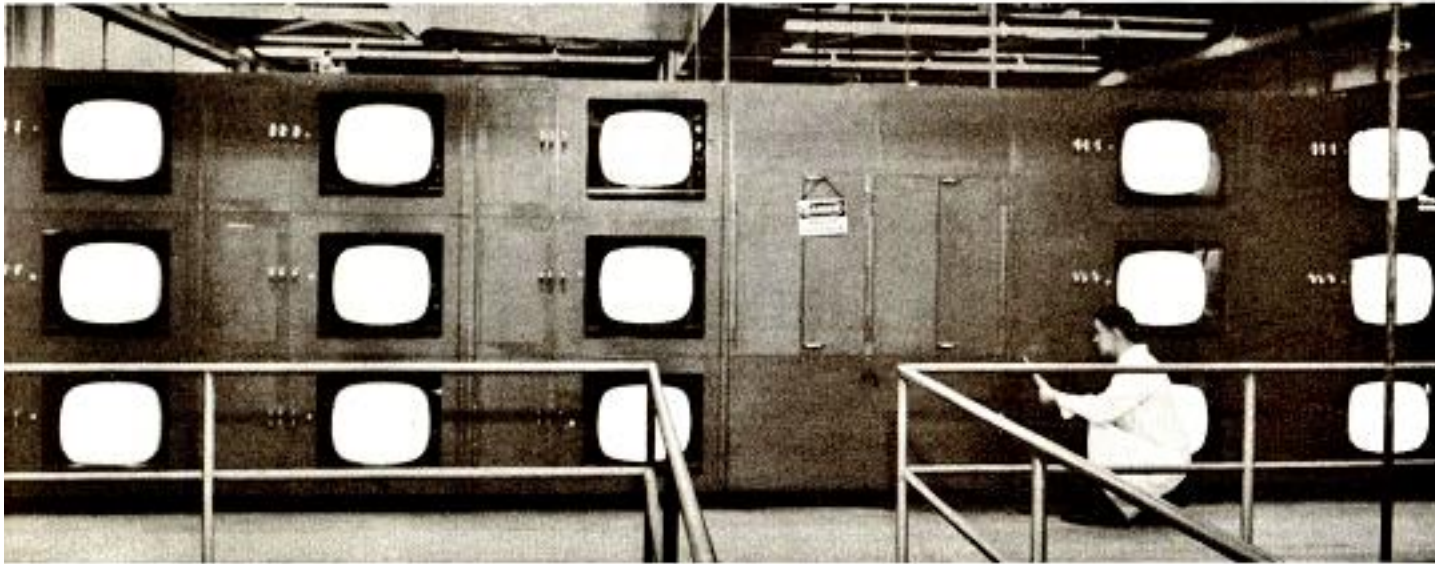


Before shipment, each tube must have at least four different production tests:

- Screen inspection in the screening room.
- Screen, glass and mirror inspection after curing.
- An electronic bench inspection consisting of 12-15 different tests.
- A final pre-shipment test made only after every tube has been stored for at least 24 hours. This ensures that screen, mirror and glass are stable and will not fail under the six tons of external atmospheric force or the shocks and vibration of normal use.



test, after test, after test . . .



In addition to all of the above tests, the Rexdale Quality Control Department regularly test samples 25% to 100% of the tubes. Its separate bench inspection involves some 50 mechanical, electrical and electronic checks of tube structure and per-

formance. Also, a representative number of all tubes are life tested; i.e., operated intermittently, above normal load for a total of 2,000 hours. Life tests take three months and go on 24 hours a day in the cabinets shown above.

people

Although pure water, fine chemicals and top-grade equipment play a vital part in TV picture tube production, as always, people are by far the most important factor.

Without the right people possessing imagination and expert, up-to-date knowledge, the \$4,000,000 Rexdale plant could never have been built. Without carefully selected employees, the production standards set could not possibly be maintained.

This is not all. Every day, design and production employees are cooperating to introduce new and better methods to give you a finer TV picture tube than ever before.

When you are buying a picture tube, insist on one manufactured at the Rexdale Plant. You will be glad you did.

**CANADIAN
GENERAL
ELECTRIC
COMPANY LIMITED**
Toronto, Ontario

