

HIGH ELECTRON ENERGY

The high energy delivers the best penetration and the fewest cracked stones.

Adjustable energy allows fine tuning of the treatment parameters for the best color and best throughput.

HIGH RELIABILITY

24 hours per day, 7 days per week, 365 days per year.

Low operating costs.

Standard commercial components.

OUTSTANDING CONTROL

PLC control for low-level machine functions.

Windows-based user interface.

Microsoft SQL database.

Detailed batch tracking and scheduling.

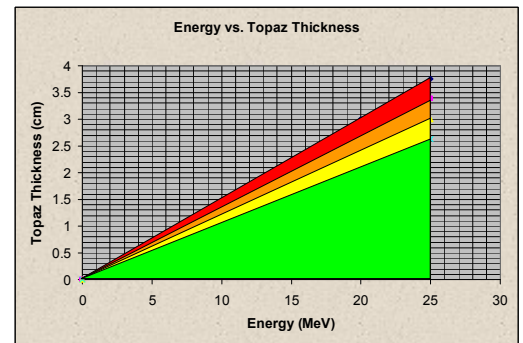
Recipe storage and management.



- Electron energy up to 25 MeV.
- Up to 16kW of beam power.
- PLC machine control.
- PC user interface and data management.
- Designed specifically for treatment of gemstones.
- Radiation dose is delivered in fractions to control the temperature rise of the gemstones.

The Mevex MB20-16 is the first linear accelerator system designed and constructed purely for gemstone applications. The components are off-the-shelf, and commercially available. The system is designed to run 24 hours per day for months at a time. Our systems have operated for 6 months without any interruptions.

The MB20-16 provides electrons with configurable energies up to 25MeV. Higher energies mean fewer cracked stones... even for brittle neutron-treated materials. This means significantly less product damage which is especially important when you are irradiating stones for a paying customer.



The graph shows the safe thicknesses for irradiation of topaz varies with energy. The green zone indicates no danger of breakage. The red zone indicates a high probability of breakage. Note that the Mevex system can deliver the electron dose in many "fractions" to practically eliminate breakage.

Optimum machine settings:

Electron energy	22 MeV
Dose fractions	50 kGy ($\Delta T = 56\text{ C}$)
Topaz thickness	24 mm
Stone coolant temperature	20 to 40 C
Electron beam power	15kW

Topaz properties:

Composition	Al_2SiO_4 (x)
Hardness	8
Density	3.4 – 3.6
Structure	Orthorhombic
Specific Heat Capacity	880 J/kg C

Specification Summary

EASY INTEGRATION

Mevex's philosophy is to simplify the installation of your electron beam system. Easy cooling water, easy electrical, easy mechanical.

The Mevex cooling system is a closed loop system. The heat exchanger has large passages to prevent clogging. This means that there are no unreasonable specifications on the quality of the water used to cool the machine.

The system is capable of accepting facility cooling water over a wide temperature range which means that cooling towers and fan boxes are viable options.

The Mevex family of accelerators is designed to withstand unpredictable electrical supplies without exotic protection equipment.

E-beam made easy.

Beam orientation	Vertical
Beam energy (Ep)	20 to 25 MeV
Energy spread	+/- 5%
Beam pulse current is adjustable	100 to 230 mA
Beam pulse duration (selected during fabrication)	10 to 16 usec
Pulse repetition rate is adjustable	0 to 300 pps
Average Beam Current is adjustable	Up to 800 uA
Scan chamber material	304 Stainless Steel
Scan length at electron window	100 to 550mm
Scan length at electron window (unobstructed)	635 mm
Window width (unobstructed)	55 mm
Electron window material	0.002 " TiVAI
Scan frequency	0.2 to 5 Hz
Window cooling	Longitudinal air flow



Headquarters:

108 Willowlea Road
 West Carleton Industrial Park
 PO Box 1778
 Stittsville, Ontario, CANADA
 K2S 1B4
 +1 613.831.2664

European Sales Office:

161, Tervuren Avenue
 1150 Brussels, Belgium
 +32 2 77 98 199 office
 +32 478 27 28 48 mobile

European Technical Office:

Hälsingströmsvägen 15
 S-441 91
 Alingsås
 Sweden
 +46 70 65 72 033