University of Portsmouth

Health Risks to Employees Working in a Crematorium

David Wright[1] and Nicholas Wright[2]
[1]University of Portsmouth
[2]Isle of Wight Council

University of Portsmouth Health and Safety

The Cremation Process

Preparation of the body

Defrosting the body if necessary

Preparation of documents

Removal of medical implants

Body placed in cremation casket

The Cremation

Casket placed in the cremation chamber (retort)

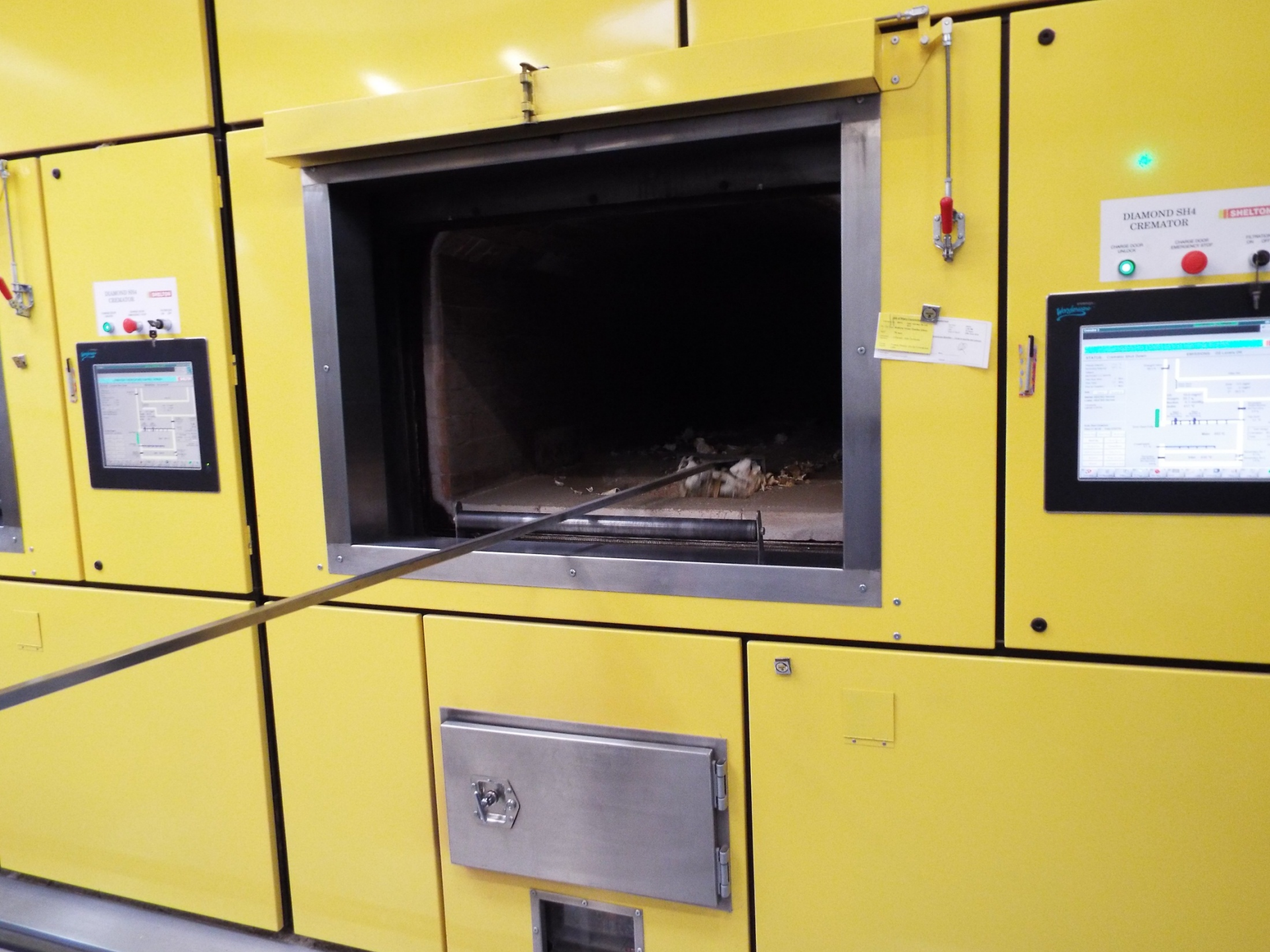
Cremation starts temperature range 870–980 °C

After 2 to 3 hours the body is reduce to ash and bone fragments

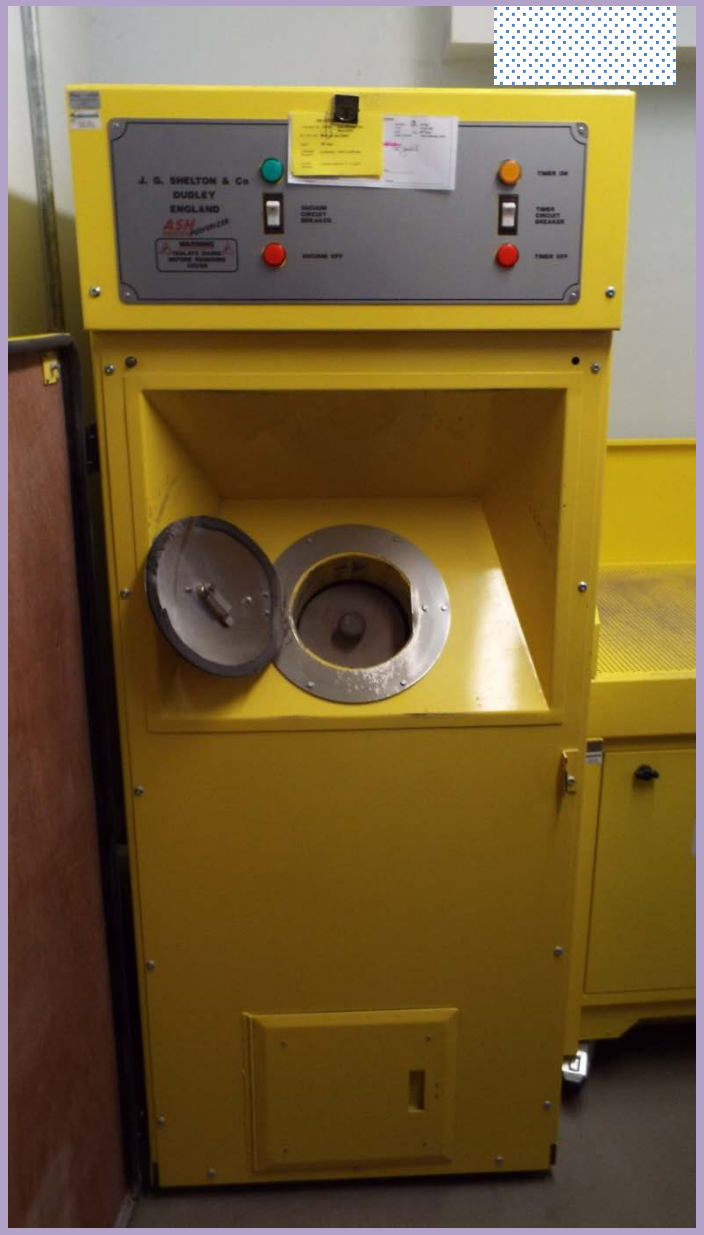
Processing the ash

The remains are removed from the retort and transferred to a cremulator where the remains are ground to a fine powder.

The remains are placed in an urn and returned to the relatives


DIAMOND SH4
CREMATOR

A Cremulator



Cremulators operate at reduced pressure to assist with the containment of the remains.
However as there is no local exhaust ventilation RPE is worn when removing the remains

Hazards associated with cremations

- **Explosion of medical implants**
  - Pacemakers and expandable orthopaedic nails are the two implants most liable to explode during the cremation process.
- **Control measures**
  - The medical practitioner completing the medical certificate in order for a cremation to take place is required to certify whether any hazardous implant is present in the body.
  - Some crematorium services use hand-held metal detectors to check that pacemakers and other devices have been removed.

Hazards associated with cremations

- **Radioactive implants**
  - Radioactive materials which survive the cremation process could present a hazard to crematorium workers who handle the ashes.
  - Examples

Isotope	Half life	Use
Iodine-125	60 days	Brachytherapy
Palladium-103	17 days	Treatment of prostate cancer
Strontium-89	50 days	Treatment prostate cancer
Yttrium-90	64.5 hours	Treating unresectable hepatocellular cancer

Hazards associated with cremation

- **Leaks of body fluids and incomplete cremations**

Hazards associated with cremations

- **Heat, dust and musculoskeletal injuries**

Dust caused by the cleaning of retort linings could contain crystalline silica

Hazards to Crematorium Workers

- **Exposure to toxic air borne chemicals**
- Gases and fumes from retorts contain toxic metals and organic compounds e.g. mercury and dioxins.
- System such as a mercury abatement cool and filter the exhaust, the solid residues extracted are collected and disposed of as hazardous waste.

Hazards to Crematorium Workers

- An example of the concentration of heavy metals in extracted material from a mercury abatement system.

Metal	Concentration mg/Kg
Arsenic	827
Cadmium	70
Chromium	370
Copper	580
Lead	7,900
Mercury	48.4
Nickel	50
Selenium	62.5