

# A Mobile Facility for Munitions and Explosives

TNO Prins Maurits Laboratory

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## “Institute for Protection”



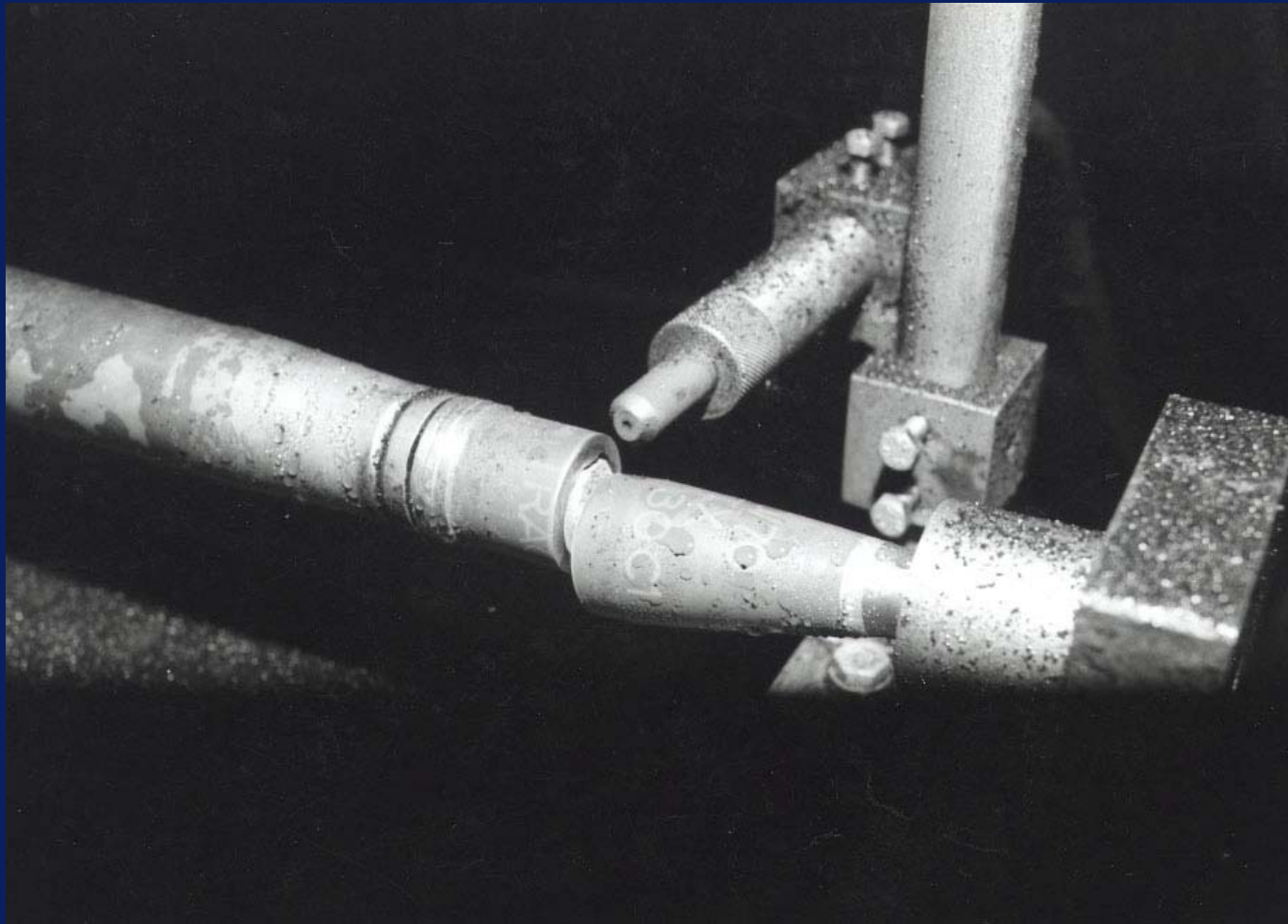
# Munitions treatment depends on calibre

- **Large calibre = >40mm**
  - **Waterjet cutting and wash-out**
- **Medium calibre 20-35 mm**
  - **Shredding and heat treatment**
- **Small Calibre < 20 mm**
  - **Heat treatment**

# Principle of Mobile Disposal Facility

- **Waterjet Cutting Munitions**
- **High pressure water wash-out**
- **Desensitizing of explosives**
- **Storage and transport as Class 4.1**
- **Incineration as industrial waste**

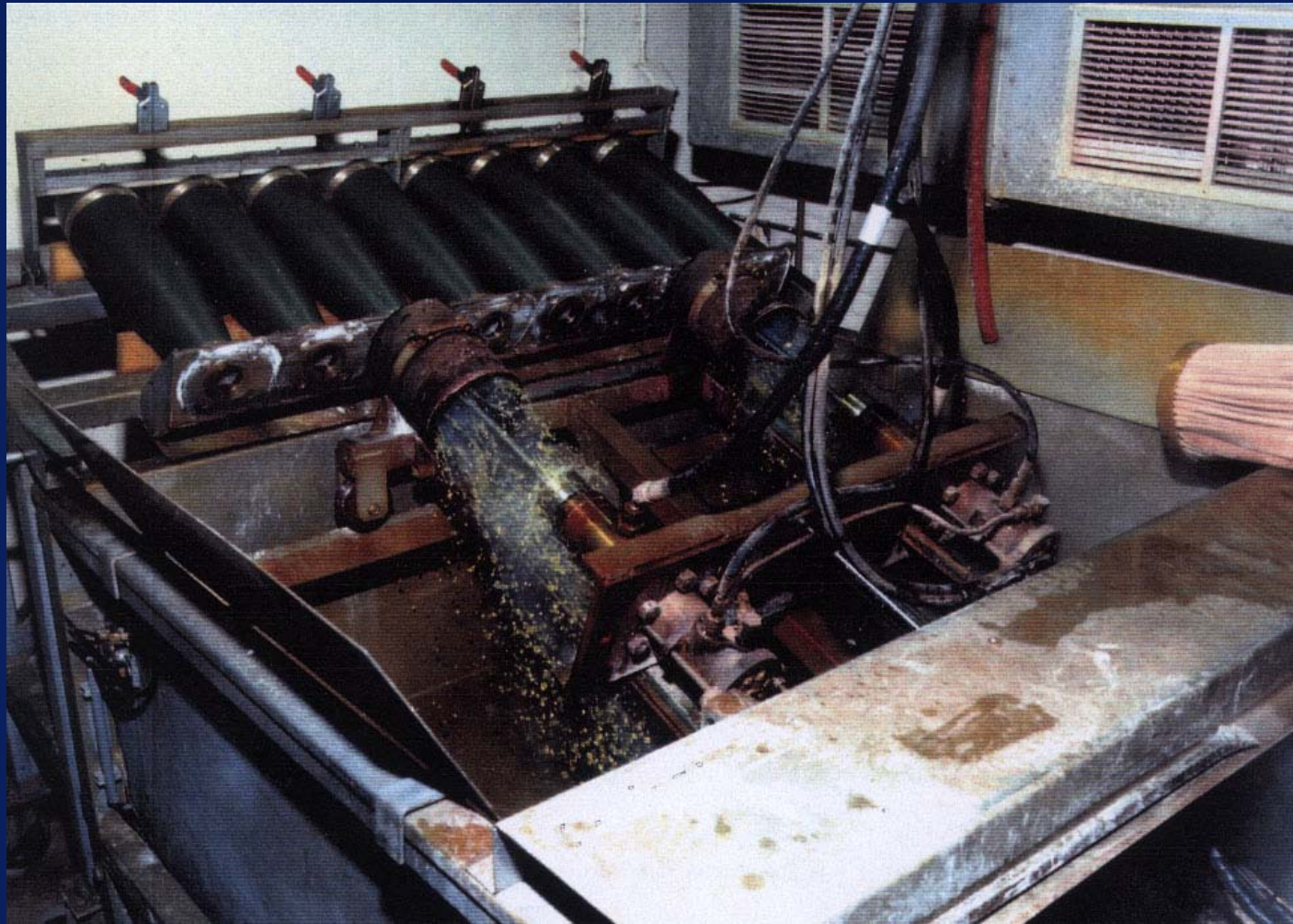
# Waterjet Cutting Munitions







# High Pressure Water wash-out





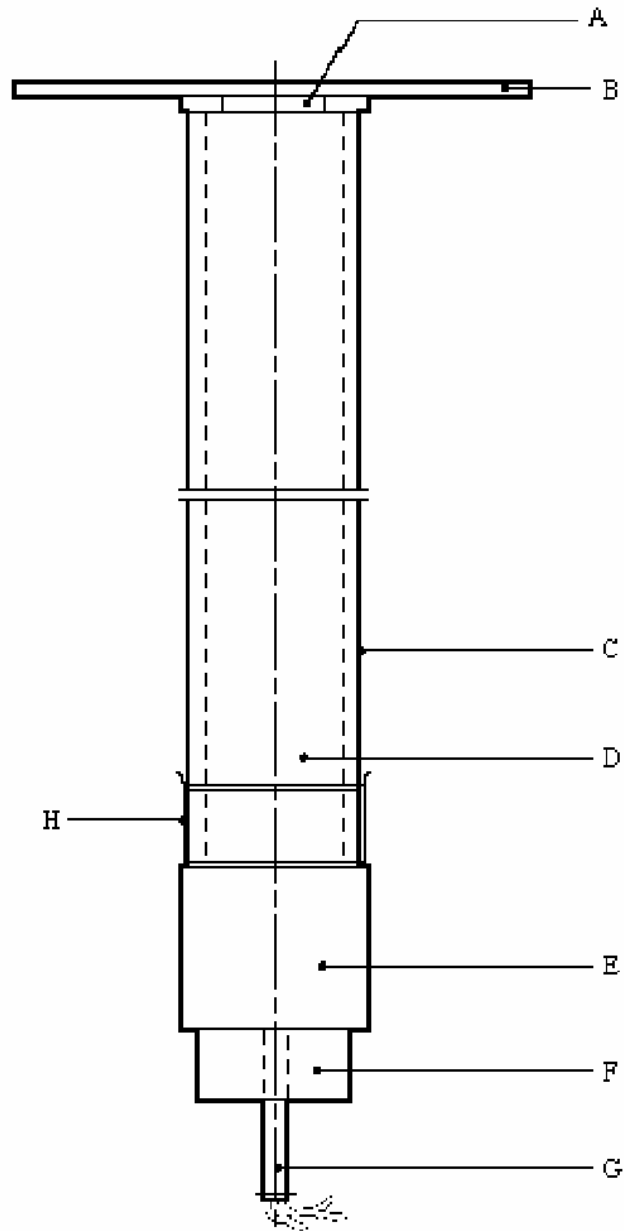
# Desensitizing of Explosives



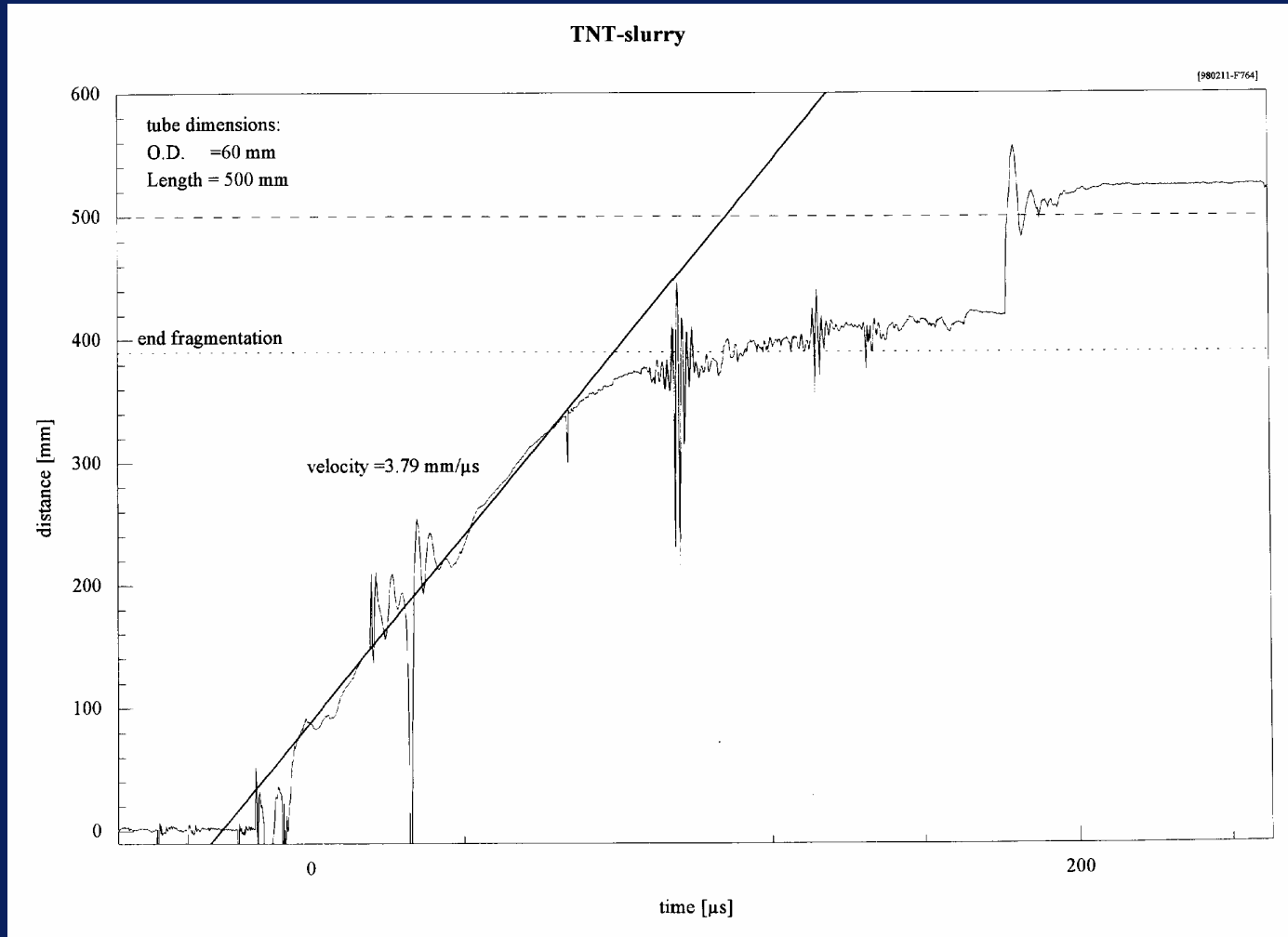
- Explosives mixed with water
- Explosives sized down to correct particle size
- Addition of stabilizer to prevent settling of explosives

# Safety Testing of Explosive Slurry

- **BAM Impact**
- **BAM Friction**
- **EU Detonation Test**
- **DDT Test**
- **Koenen Test**
- **Vacuum Stability Test**
- **Time Pressure Test**
- **Cap Sensitivity Test**
- **Electro Static Discharge Test**
- **Thermo Analytical Tests DSC, TGA, DTA**



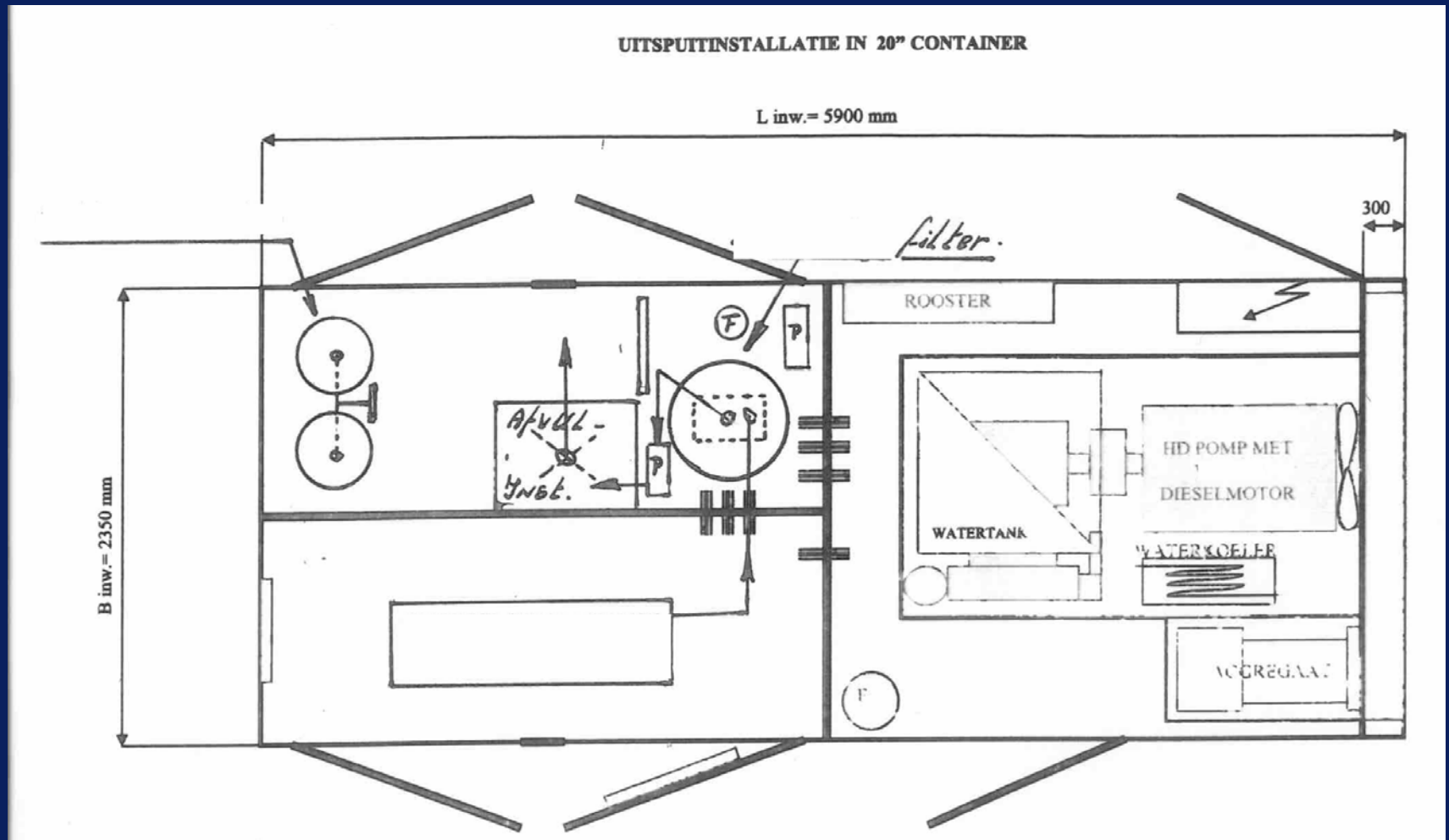
# Gap test with TNT slurry



# Conclusions Safety Testing

- **Slurry is not Explosive**
- **Transportation as Hazardous Waste**
- **Storage as Hazardous Waste**
- **Mobile Water Washout Facility**
- **Demilitarisation at Storage Site / No Transport of Munitions necessary**
- **Incineration of Explosive Waste in Commercial Waste Incinerator**

# Containerized High pressure wash-out



# Mobile Waterjet Cutting System

- Can be used independent from wash-out installation
- Munitions are rendered safe by removing the fuze by cutting it from the main load
- Main load can safely be transported to central point were wash-out is located
- Fuze can be safely transported in special bom proof container

# Conclusion

- **New approach for Explosive Ordnance Disposal**
- **Better for the environment**
- **Better for the health of EOD technicians**
- **Economic solution: estimated cost for total mobile unit is 800 K Euro**