
ITOPP

ALCEN

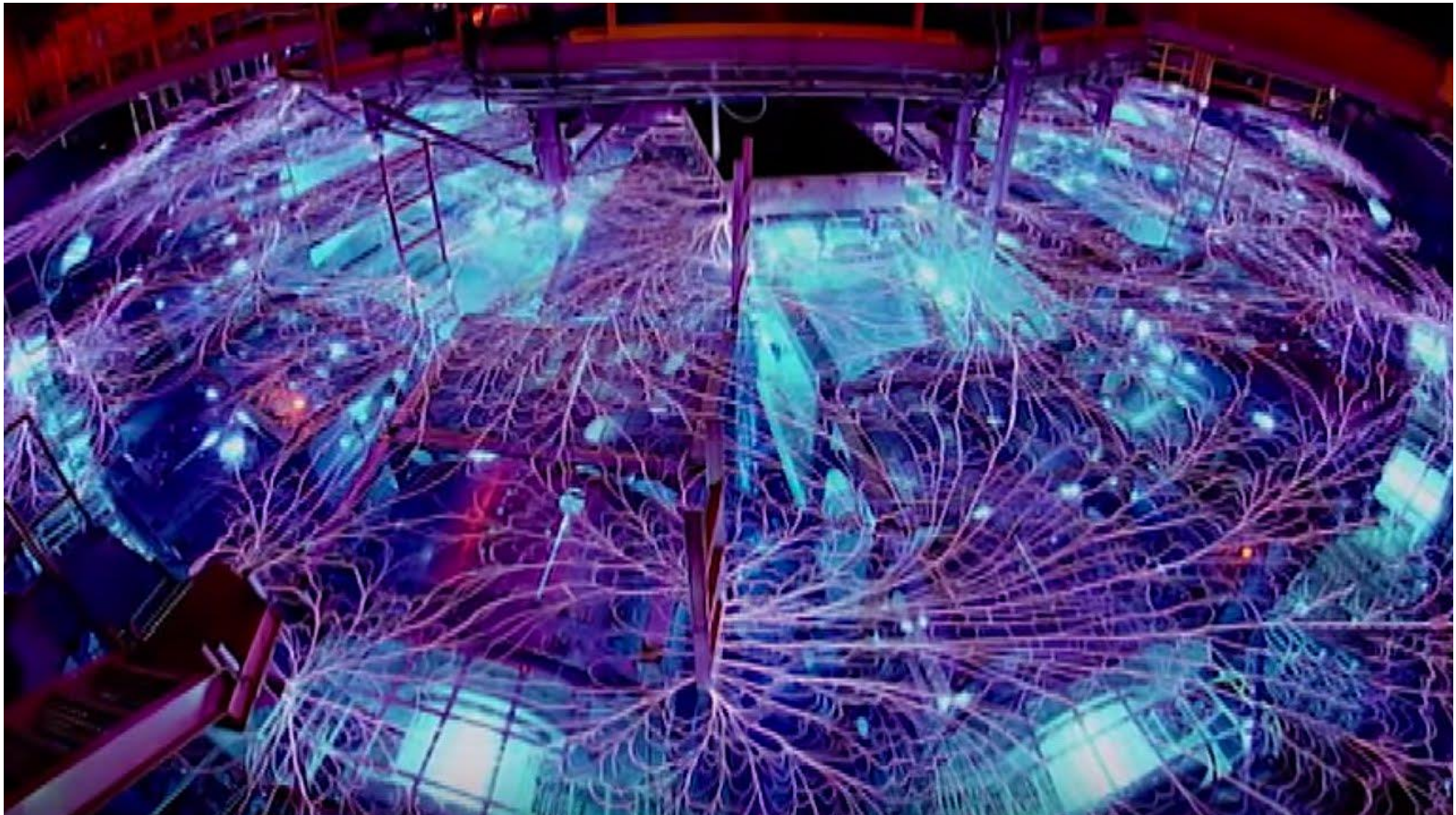
from **spark** to **lightning**



1. ITOPP in a few words
2. Research Applications
3. Defense Applications
4. Industrial Applications
 - Electron beam sterilisation
 - Rock Fragmentation

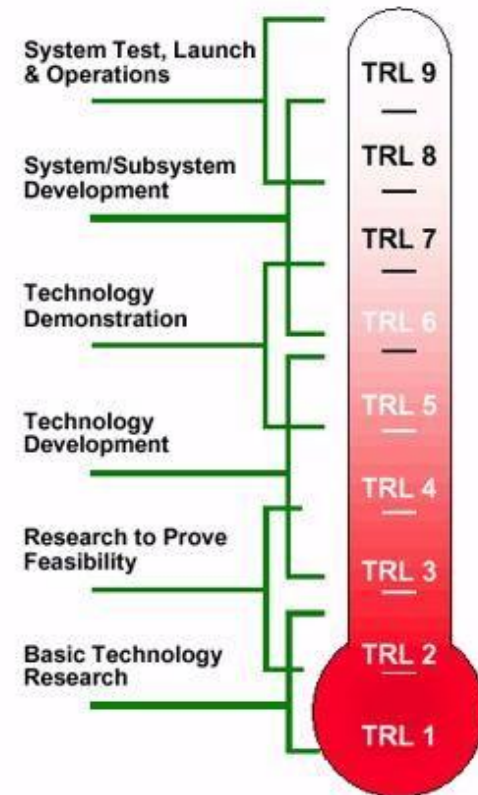
Our playground

Pulsed Power



From research to maintenance

- Fundamental and applied R & D
- Design, manufacture and test prototypes
- Small series manufacturing
- Maintenance and operation of Pulsed Power systems



A fast growth



Our "garage"



2nd extension

1st extension

ITHPP joins ALCEN




3rd extension

A new facility


A new name



ITOPP in a few numbers

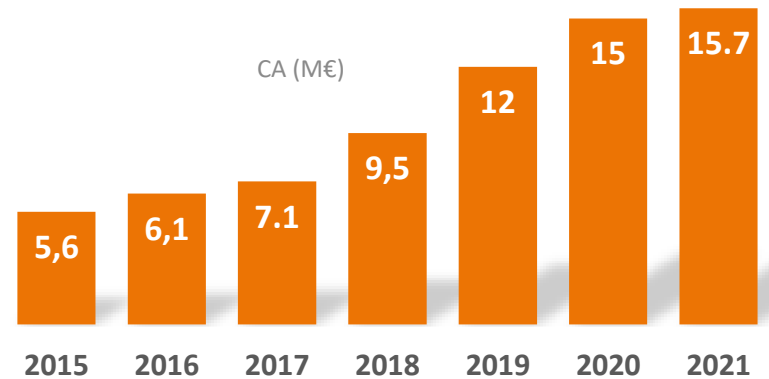
61 
employees
50% PhDs/
Engineers

2018
58% 
Sales
are
exported

Certifications
ISO 9001
ISO 14001
& ISO 45001 

4 
Millions €
Investments
for extension

Evolution of ITOPP revenues



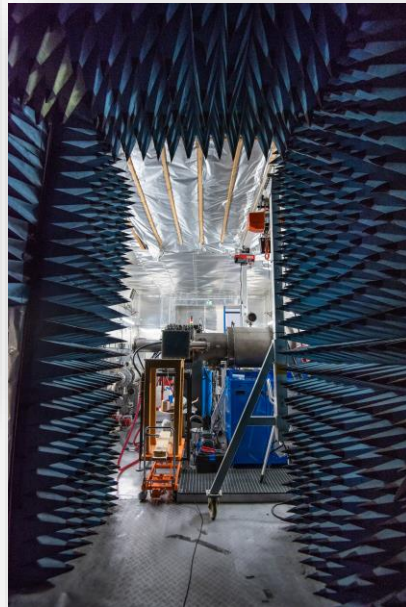
ALCEN 

220 
Millions €
Revenues

2400 

ITOPP

- 2000 m² for manufacturing, assembling and testing
 - 2 bunkers



- 900 m² for offices

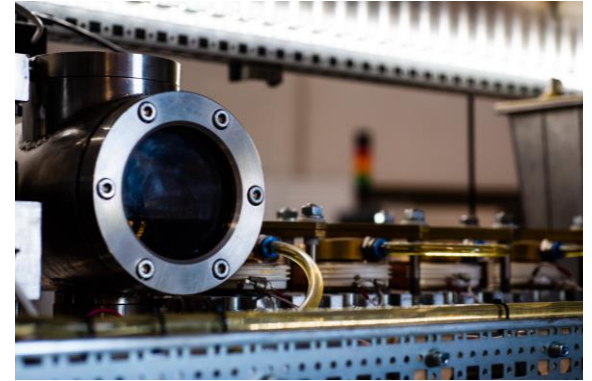
Our fields



RESEARCH



DEFENSE



INDUSTRY

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Our technologies for Research

Variable applications

- Flash Radiography
- Mechanical behavior of materials (isentropic compression)
- Projectile acceleration
- Lightning vulnerability
- High Power Electromagnetics (HPEM)
- etc.

Our technologies

- Linear transformer driver (LTD)
- Marx generators
- Energy banks
- Tesla transformers
- Power electronics
- Spark-gaps
- ...

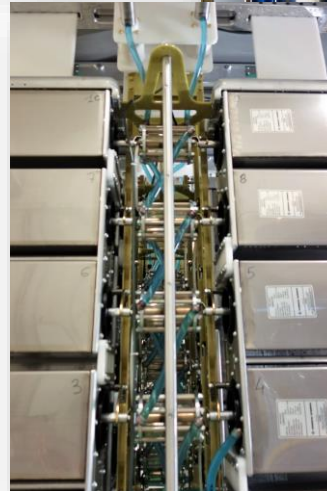
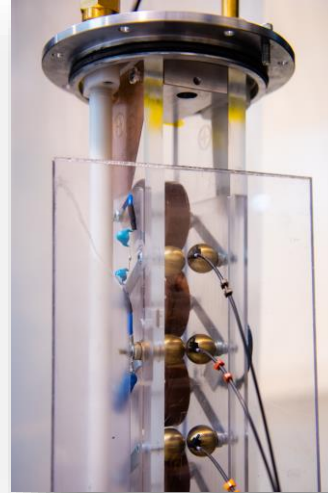
- Designs are usually customized on the customers' specifications

Flash Radiography

- Linear Transformer Driver (LTD)

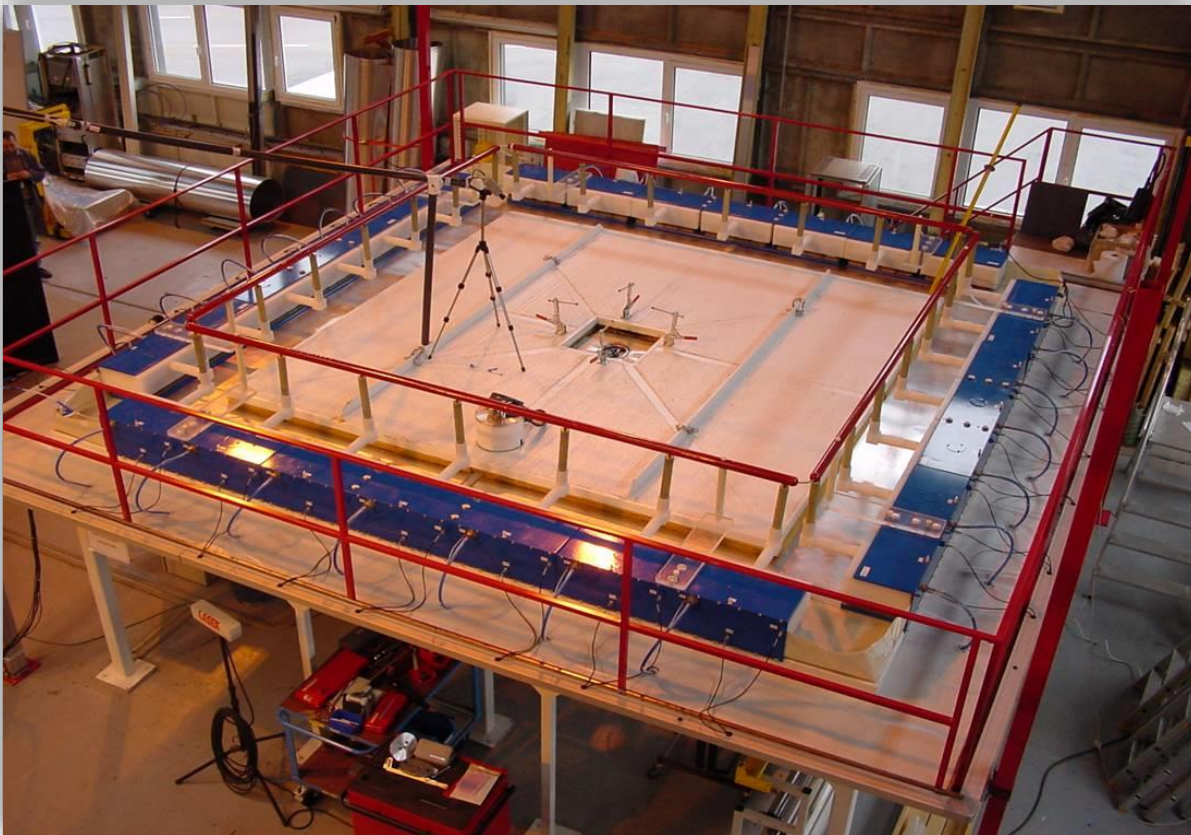


- Marx generators



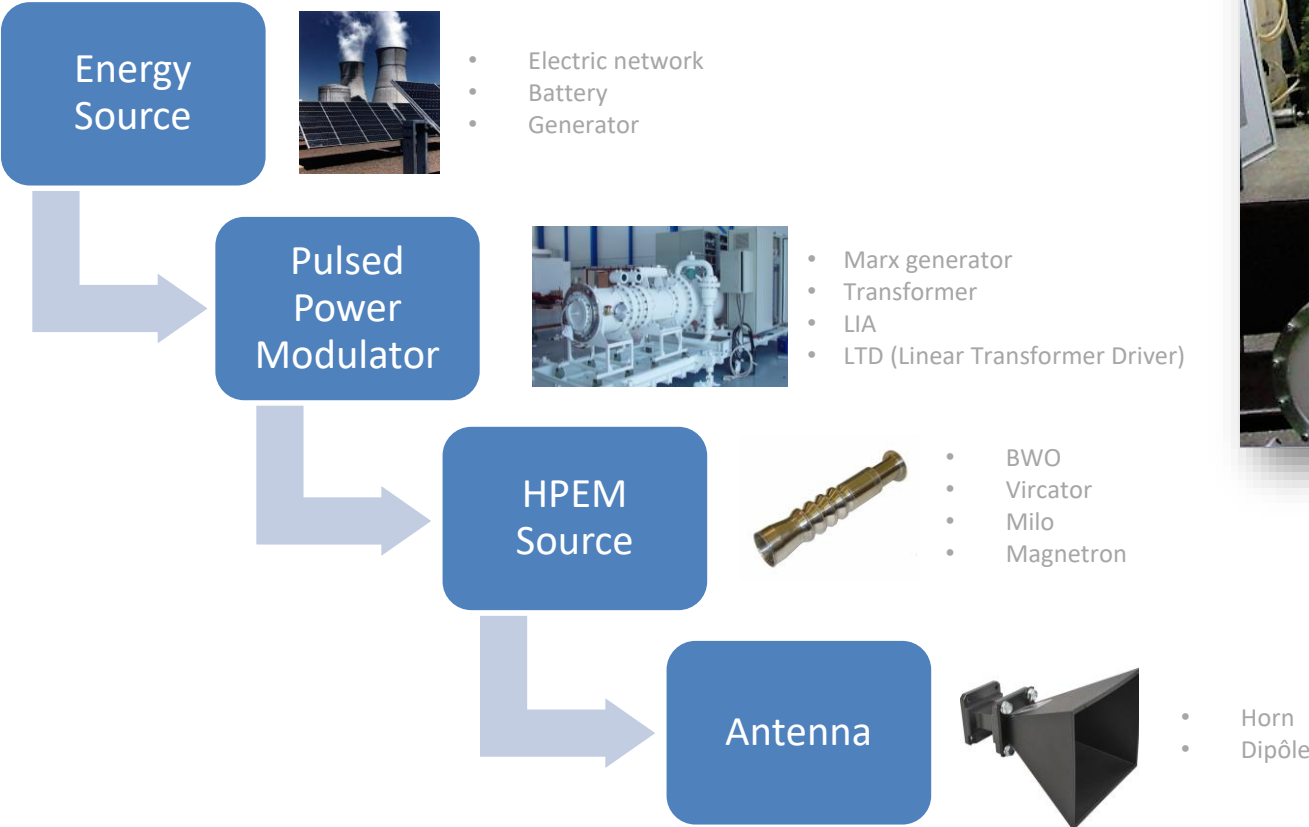
Isentropic Compression

- GEPI : the first generator in the world which was specifically designed for that application



- 3,5 MA
- 1 Mbars / 400 ns
- 17 km /s

High Power Electromagnetics



Energy banks

Possible Applications:

- Power Lasers
- Physics of high magnitude magnetic fields;
- Pulsed electric / magnetic fields



- Charging voltage : 24kV
- Stored energy : 835kJ
- Peak current : 250kA
- 1 shot / 5 min



- Charging voltage 24kV
- Stored energy : 2x3MJ
- Peak current : 150kA
- 1 shot / 10min

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3. **Defense Applications**
4. Industrial Applications
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The UAV problem

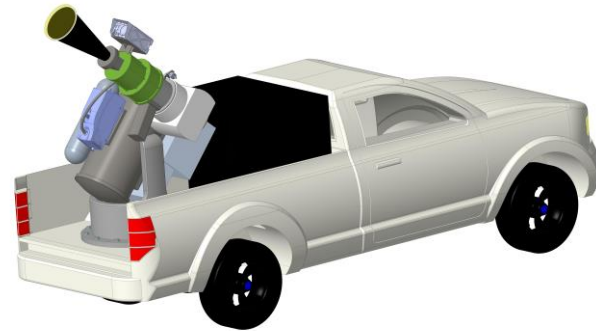
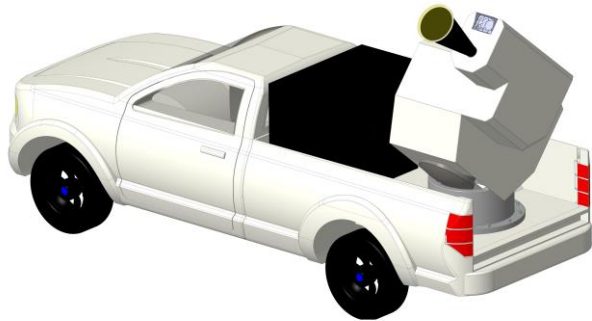
- **Several types of threats :**

- UAVs loaded with explosives
- Spying UAVs
- Commercial UAVs (DJI)
- (Future) autonomous UAVs
- Single UAV or swarms



What we are developing!

- HPEM weapon on a turret
- System fit on a 4WD vehicle
- Can be operated with other detection, identifications or neutralization systems



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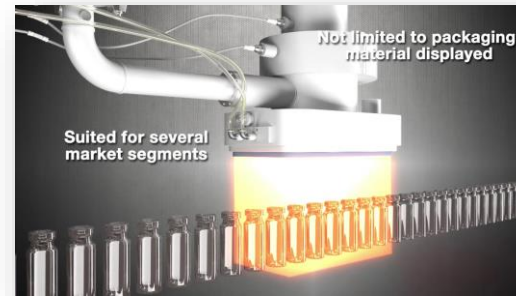
Electron beam sterilization

- We use electron beams to destroy micro-organisms
 - Pulsed
 - Continuous.



Development and test system available at ITOPP :

- 250 KeV
- 5kA
- Pulse duration : 10 ns



Window can be adapted to the shape of the product



Electron beam sterilization

- Main advantages

- Integrated on customers' premises
- High performance : 6log reduction
- ON / OFF System
- Dry process without any consumables or residue
- High throughput

- Important markets



Fracturation

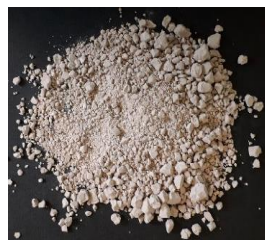
- Fracturing and crushing is the most energy consuming step in the mining process.
- ITOPP developed a crushing solution using an electrohydraulic process.
- Energy savings
- Pollution reduction
- Selectively liberating minerals



Ø 10-15 cm



100 shots



200 shots



500 shots



2500 shots



Block Fracturation

1 tir _ 200 kJ



Thank you for your attention



ITOPP

Hameau de Drèle
46500 Thégra - France
contact@ITOPP-alcen.fr
+33 5 65 33 43 30
www.ITOPP-alcen.com

ALCEN

6 rue Paul Baudry
75008 Paris - France
alcen@alcen.com
www.alcen.com



Last announcement

On January 1, 2023,

ITOPP becomes ITOPP

ITOPP
ALCEN
