



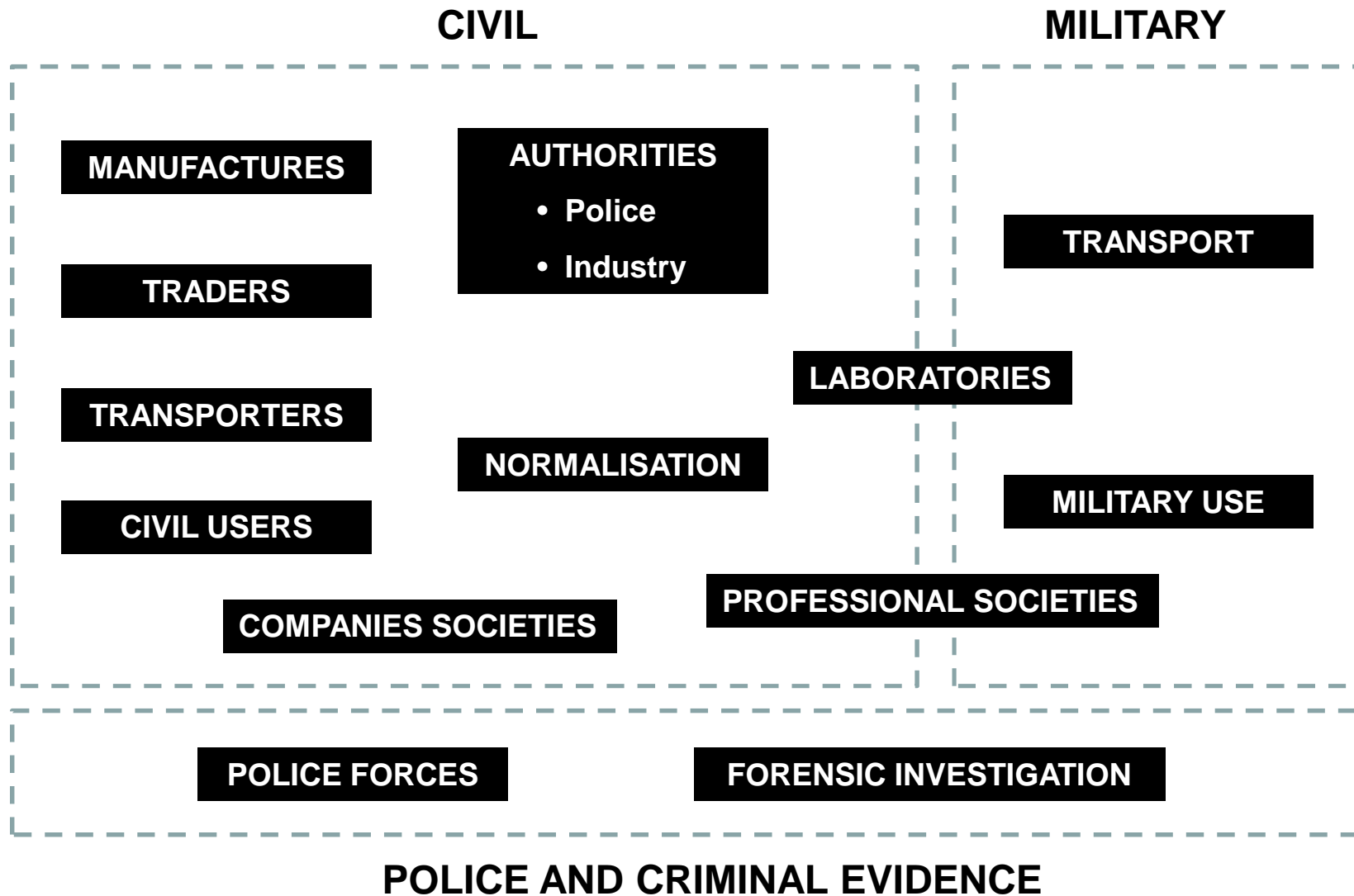
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# EXPLOSIVES EDUCATION IN PORTUGAL

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# Explosives sector in Portugal



# General education

## Compulsory school

- 9 years
- Basic sciences and 2 foreign languages
  - **1<sup>st</sup> cycle: 4 years**
    - » Start at 6 year old
    - » Incl. national exams in Mathematics and Portuguese Language
  - **2<sup>nd</sup> cycle: 2 years**
    - » Incl. national exams in Mathematics and Portuguese Language
  - **3<sup>rd</sup> cycle: 3 years**
    - » Incl. national exams in Mathematics and Portuguese Language

# General education

## Complementary studies

- Secondary school
  - 3 years
    - General profile
      - » Incl. national exams: Portuguese Language + specific disciplines according subject of the course
    - Professional profile
      - » Incl. national exams: Portuguese Language + specific disciplines according subject of the course
- High school
  - VET: Vocational education courses: ~ 1,5 years
    - » Training in professional context
  - Graduate: 3 years
  - Specialisation course: 1,5 years
  - Master: 2 years
  - Doctor: 3 years

# VET-Vocational education training

## Learning organisation and process

- Private companies
  - *In school and distance learning*
- Public companies
  - *In school and distance learning*
- Technical schools
  - *In school and distance learning*
- Professional and companies societies
  - *In school*
    - » *Period of course: evening and weekend*
- High schools
  - *In school*
    - » *Period of course: evening and weekend*
  - *Distance learning*

# Portuguese rules on education in explosives

- Manufacturing, trading, storage explosives
  - Technical responsible
    - Graduate in Engineering
      - Education subjects: Chemical or Mining
    - Graduate of Army Forces
      - Vocational subjects : artillery, material services, maintenance of guns and munitions
- Use explosives or powders
  - Shotfire
    - Compulsory school
    - Approval in examination on matters related with the subject

# Portuguese rules on education in explosives

- Manufacturing, trading, storage fireworks, powder and hunting cartridges
  - Technical responsible
    - Compulsory school
- Use fireworks
  - Shotfire
    - Nominated by the technical responsible of fireworks manufacture.

# Portuguese rules on education in explosives

- Transport of dangerous goods
  - Drivers
    - Approval in examination on matters related with the subject.

# Regular courses with matters related to explosives

## High schools

- Graduate/Master in Mining
  - 3/2 years
- Specialisation course in Geosciences and Environment
  - 1,5 years
- Master in Geosciences and Environment
  - 2 years
- Short courses
  - 50 hours

## Military schools

- Master in Military engineering
  - 5 years
- Navy school

## Police schools

- Police Special Forces course
  - 6-9 months

# No regular courses with matters related to explosives

## Other organisations

- Companies and professional societies
  - Transport of dangerous goods (not specific for explosives)
    - Minimum of 18 hours
    - Refresh courses are provided every five years.
- Manufactures or trading companies or companies and professional societies
  - Rock blasting
    - Around 30 hours
  - Pyrotechnics
    - Around 20 hours

# Certification of courses with matters related to explosives

## High schools

- Graduate and Master courses
  - National Board Committee on the Evaluation of High Schools

## Other organization

- Course in transport of dangerous goods
- Evaluated and certified for a period of time (3 years):
  - National Authority of Transports

# Conclusions

## High schools

- Courses include matters related with explosives
  - 1 or 2 disciplines, which is equivalent to 45 to 90 h
  - Subjects: basic concepts, properties and types of explosives, initiation devices, calculation of blasting operation, debris effects, legislation, application of explosives in mines and quarries.

## Military schools

- Courses include matters related with explosives
  - 1 or 2 disciplines, which is equivalent to 45 to 90 h.
  - Subjects: basic concepts, properties and types of explosives, initiation devices, calculation of blasting operation, debris effects, explosive ordnance disposal.

# Conclusions

## Police schools

- Courses include matters related with explosives
  - Include matters related with inactivation and disposal of explosive devices

## Societies and companies

- Short courses to prepare people for the examination to the national authorities
  - Shotfire: basic concepts, properties and types of explosives, initiation devices, debris effects, legislation, application of explosives in mines and quarries
  - 30 – 40 h

# Conclusions

- Legislation for explosives with more than 25 years old only requires the competence of the technical responsible
- A few workers follows vocation education courses
- Competencies and qualification based in levels are not in force
- Vocational education courses in explosives are not certified