

INTERNSHIP IN CAVA DE TIRRENI

- an unique experience abroad -

In September 2015 we had the chance to be part of the ERASMUS+ KA1 Mobility VET program and stay in Cava de Tirreni for 25 days.

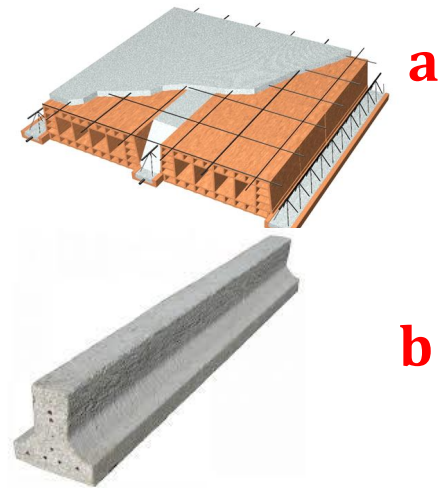
As our school (HTL Hallein) has a partnership with the IIS Della Corte Vanvitelli in Cava de Tirreni we had the possibility to make a work experience in the company La.Sp.ed Tirreni.

We learned much about building materials (e.g. concrete, steel, wood) and tested it on different machines.

In the following pages we want to show you the treated materials and methods:

BUILDING MATERIALS

- a) ORDINARY CONCRETE
- b) PRESTRESSED CONCRETE



CONCRETE:

- binder (cement)
- granules (gravel, macadam, sand)
- water
- admixture (thinner, plasticizer, accelerator, etc.)



COMPONENTS OF CONCRETE

By doing following steps, you can get the grading curve of mineral compounds :

- determinate the maximum size of the different components;
- select the number of filter (depends on the component-sizes)
- weigh the different filters and calculate the percentage of everyone
- build up the curve



TESTS ON CONCRETE

To estimate the concrete different tests have to be made. These characteristics are:

- compressive strength;
- tensile strength;
- elastic behavior;
- coefficient of thermal expansion;
- withdrawal;
- viscosity;
- durability

The assessment of these characteristics are important in new buildings and also in existing buildings.

TESTS ON CONCRETE WORK

To intervene on buildings there are two types of evidence: direct evidence and circumstantial evidence.

- In the **direct test** we measure the resistance of samples taken from the structural elements. They are considered destructive tests;
- In **indirect tests** we measure some physical or chemical characteristics which yields an estimate of the resistance through correlations. Generally are moderately or not at all destructive tests.

TESTS ON CONCRETE ON BUILDING SITE

The fresh concrete is subjected to various tests, to determine the properties and the suitability. One of these tests is especially important to determine the consistence of the concrete. For this a conical bowl is used for.

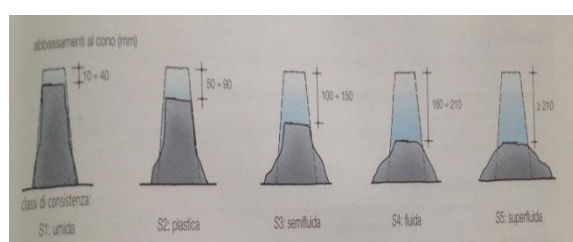
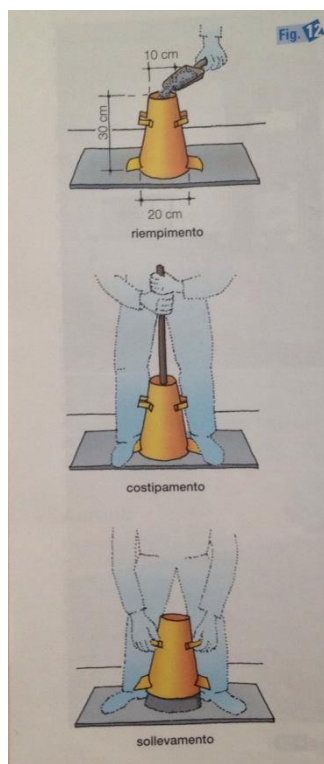
The bowl is 30cm high, has a diameter of 20cm and an over diameter of 10cm.

The bowl is filled with concrete.

With the result of the test the concrete can be classified in consistence categories:

- wet: 10 bis 40 mm reduction;
- plastic : 50 bis 90 mm reduction;
- halffluid: 100 bis 150 mm reduction;
- fluid: 160 bis 210 mm reduction;
- extrem fluid: reduction ≥ 220 mm

The conical is splited in 3 various sectors. (every section is 10cm high) By stirring with an iron bar, air is removed from the concrete. (To avoid chemical reactions e.g. cracks in the final concrete.)



CUBIC SAMPLE

The cubic sample is defined by the international norm (UNI). The norm determines how much samples have to be taken and how the sample has to look. In the prefabricated cube, 3 concrete layers are filled in.. After every layer you have to stir, otherwise there would be airbubbles in. The sample is dried by dipping it in 20 ° C warm water for 28 days. The kind of the crack shows important information about quality of the concrete. The concrete sample is okay, if it looks like 2 oppositely pyramids.



CYLINDRICAL SAMPLE

With a cylindrical sample a sample is taken out from the wall to test the compressive strength.

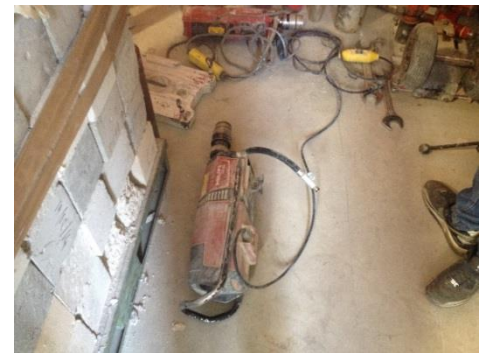
The core drills have a diameter from 7 – 16cm.

After taking the sample, the hole is filled up with mortar.

The cylindrical samples are marked and photographed and after that transferred in a laboratory to make a tensile test.

The sample consists of following steps:

1. Search the area, where the sample should be taken
2. Remove the stucco
3. Determine which diameter should be chosen
4. Drill a hole
5. Analyse the sample



CYLINDRIC SAMPLE WITH CARBON FIBER

To increase the compressive strength, the carrots are surrounded with resin and carbon. This method is for rehabilitate old buildings with structure problems.

Simultaneous there are also samples without carbon fiber tested to show the difference.

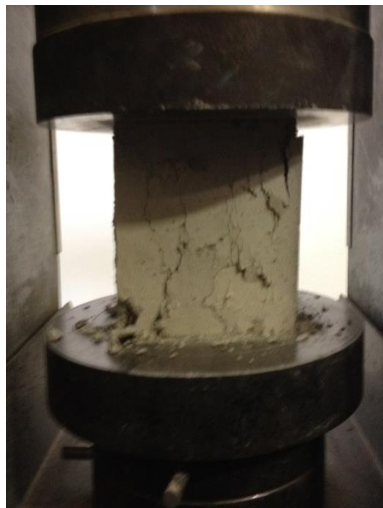
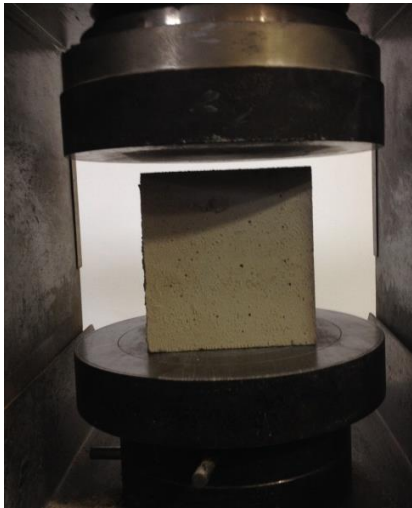
Das Verfahren für eine solche Anwendung:

1. pour a middle viscously epoxide-glue for the impregnation in a bottle
2. put the glue on the carrot and on the carbon fiber
3. surround the carrot with the carbon fiber
4. prove that there are no airbubbles between the 2 materials
5. start the sample on the machine



SAMPLE OF COMPRESSION

The compression tests consists of samples, which have a cube or cylindric form. These tests are conducted by placing the samples on the steel plates. In cubic samples the load tends to expand in the transverse direction. The result is a confinement effect by the direct contact of the plates. For this reason the transformation of the sample is maximal in the middle and fractures occur at the contact points. The result are two opposite pyramids.



PACOMETRIC INVESTIGATIONS

Pacometric tests will be done with the aid of pacometers. The device measures the presence of iron and concrete with steel. It is measured by moving the tool on the surface. It shows the position, direction and the number of the steel in the wall. It can also see if there are pipelines or electric wire.



SCLEROMETRIC INVESTIGATIONS

The tool called rebound hammer is used for measure the hardness of concrete. The hammer is a mechanic machine, which is based on movement from metal in a special direction and it works because of force from the pressure spring. The solution is called rebound index. The test is made by following steps: Begin at a distance of min. 3 cm from the edge we are setting 12 points. The highest and the lowest measure have to be cut out and the arithmetic middle value is calculated.



ULTRASONIC SAMPLE

With the examination, made by ultrasonic probe, we can measure the propagation velocity of the impulses from ultrasonic longitudinal shaft in the concrete, can be calculated. Therefore the following characteristics are determined:

- Unity of concrete
- Existing cracks or cavities
- Strength of concrete on site

There are three positions

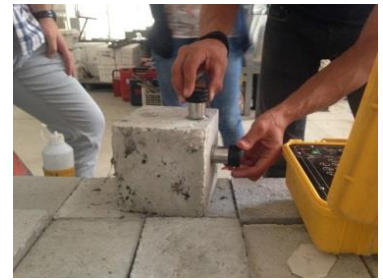
- direct:



half direct



indirect



METAL:

SAMPLE OF STEEL

Clamping force is the most important thing for judging the quality. The test piece is kept on tension till it breaks. It is shown on a diagram.

The various parts are: elastic, elastoplastic, plastic



OUR IMPRESSIONS AND EXPERIENCE

We are very happy about our decision to go to Italy for our practice abroad.
Our goal was:

**get new experience &
learn about other materials**

We learned many new things and broadened our mind.
It was not just good for our education, also for our personality.
We are more open-minded and know something about other lifestyles.
Especially about the mindset from people from south Italy

