- **Why is it that DRENOTUBE could stand the pressure with a S8 tube when we use with gravel a S12 tube?**

Here I would suggest reminding them about the standard pressure values that drainages are under (the document that I sent you). The reason why we can use an SN8 drenotube instead of an SN12 pipe is that the outside layer of geoaggregate (grey EPS pieces surrounding the pipe) adds area to the bundle and therefore the pressure that is transmitted to the pipe is smaller. This helps to diminish deformation and deflection. Knowing that:

$$P = \frac{F}{S}$$

F = Force
S = Surface
P = Pressure

If we name S_1 the outside surface of a standard 160 mm pipe (outside diameter of the pipe that we use in the drenotube) S_1 would be:

$$S_1 = \emptyset_1 \cdot \pi * L = 160 \cdot \pi \cdot L = 160\pi L$$

$\emptyset_1$= diameter = 160 mm
L= Lenght

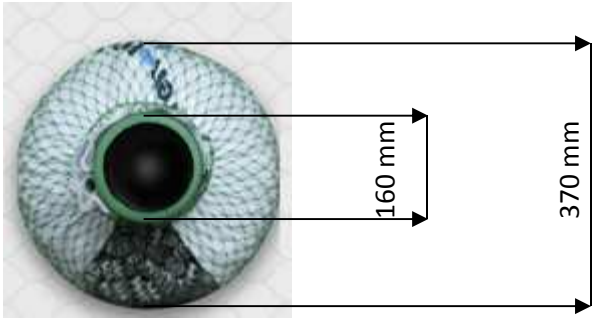
Drenotube's outside area (S_2) is different because of the layer of geoaggregate:

$$S_2 = \emptyset_2 \cdot \pi * L = 370 \cdot \pi \cdot L = 370\pi L$$

$\emptyset_2$= diameter = 370 mm
L= Lenght

So we can see that **$S_2 > S_1$** => $\frac{S_2}{S_1} = \frac{\emptyset_2 \cdot \pi * L}{\emptyset_1 \cdot \pi * L} = \frac{\emptyset_2}{\emptyset_1} = 2{,}31$

The fastest answer would be to jump and say that because the area of drenotube is more than double the area of the standard pipe, that the pressure applied to drenotube would be half the pressure of the standard pipe. Now, that would be true if the material would not deform under pressure, but EPS does. This is where the document that I sent you regarding pressure comes into play. First, let's take a look at the dimensions of the ensemble DR370L6:



EPS aggregate: 370-160 = 210 mm

Drainage systems are usually installed close to the surface and stand pressure values under 30 kPa. In this situation, the EPS aggregate absorbs the majority of the deformation. For example:

-Under 20 kPa, total deformation of the bundle (using SN4 pipe) is 65 mm

-EPS aggregate has an instant deformation of 25%: 210*0,25 = 52,25 mm

-Pipe has a deformation of 65-52.25=12,5 mm (9% of pipe diameter)

Final diameter outside the pipe: (210-52,25) + 160 = 317,75 mm. Now S_2/ S_1 is:

$$\frac{S_2}{S_1} = \frac{\emptyset_2 \cdot \pi * L}{\emptyset_1 \cdot \pi * L} = \frac{\emptyset_2}{\emptyset_1} = \frac{317{,}75}{160} = 1{,}99$$

So even though the aggregate shows an obvious deformation, the increased area around the pipe helps to release pressure.

Because **$S_2 > S_1$** then:

$$\left(P_1 = \frac{F}{S_1}\right) > \left(P_2 = \frac{F}{S_2}\right)$$

Deep installed drainages are under bigger pressure values. Under 100 KPa DR370L6 is capable of draining up to 65% of his maximum hydraulic capacity even though the ensemble has a deformation of 42%. That is why we offer an SN8 pipe, which will be suitable for higher pressures.

There are patents that talk about reinforcing pipes using EPS just like drenotube: http://www.google.ch/patents/US20040089359

- **If we would demand that we want DRENOTUBE delivered with a S12 tube diameter 160mm, is that possible?**

It is possible to have drenotube with an SN12 pipe. When I say possible I mean that SN12 pipes exist and they can be used with our machine. Problem is, we would have to purchase them abroad (not in Spain), bring them to our facilities and them export drenotube, which makes this option economically not possible. Furthermore, we think that the SN8 pipe fits most of the higher pressure installations.

- **DRENOTUBE is a fairly young product so how can you give us the certainty, that it will works well over a long period?**

It is true that drenotube is a fairly young product, but the idea came from the US back in the eighties. We just improved the design to make it last even longer. Product has been monitored and evaluated on-site and approved through most US States since 1991 with thousands of installations in use. There are patents and already approved projects. For example:

http://www.google.ch/patents/US6467996

http://www.mah.gov.on.ca/Asset12569.aspx.

- **What are the guarantees you can give us that it will be good**?

Constant quality parameters: It is the only all-in-one drainage product that has the CE mark. This indicates that drenotube is complaint with the relevant EU legislation. Drenotube assures a final quality of the finished system, maintaining the characteristics according to its datasheet in its entirely application. This is a consequence of being a industrial preformed product, with the correspondent quality controls stipulated in the industry, thanks to which, it is guaranteed that all drenotube modules have the characteristics described in its datasheet.

The construction/installation of classical systems has a great susceptibility of suffering irregularities of its thickness along the length as a result of neglectful distributions of the gravel or a defective placement of the geotextile.

Materials: All materials used in drenotube are polymers, so they have an extremely long life that assures that the product will stand the test of time.

Talking more specifically about the EPS aggregate, as this is the material that is not used in French drainage, all of its properties make this material the obvious choice for a drainage product: resistance to water, dimensional stability, temperature resistance, chemical stability, it doesn't rot and it doesn't rust nor it decomposes. This compound is not a nutrient of microorganisms so it will not be affected by soil bacteria. Finally, because it is chemically stable, it is not a water pollutant.