

Carta de bienvenida de EAPA

The european asphalt industry is innovating more than road users often realise

Introduction

When people talk about the technical innovations that are taking place at this moment, they mostly speak about the developments that have been made in the telecom and the computer areas. Here equipment of three years old is sometimes already old fashioned and outdated. Also in the area of transport a lot of progress has been made. Much attention has been paid to electric cars, but in fact the cars still have four wheels and a conventional steering wheel.

The main concept of the cars, buses, trucks and motor bikes that are using the roads, has not really changed much. When comparing the asphalt industry with the car industry, one might see similarities; most attention has been paid to safety, comfort, noise and environment and CO₂ emission.

To be able to see the real progress made in the asphalt industry one should take a longer observation period than three years.

Innovations in the asphalt industry

The main advancements in the asphalt industry can be regarded in different areas;

- Changes in knowledge levels and forms of contract
- Asphalt mixtures
- New requirements for the road surfaces
- Energy and Carbon Footprint reduction
- Developments in paving techniques

Regarding levels of knowledge and forms of contract the following developments can be observed:

Knowledge level

- The knowledge level of contractors and suppliers has undoubtedly increased and is now (in many countries) at a high level and they have a better in-depth knowledge of asphalt as a material.
- In contrast we can see that, increasingly, the experience and in-depth knowledge level of Highway Authorities is eroding due to their merging into larger departments and also to the transfer of risk to end use criteria. In some cases the in-depth knowledge previously available has disappeared.

Contractual situation

- The changes in knowledge levels at the contractor and road authority side has also had an influence on the contractual situation. In the past many road authorities prescribed to the contractor/supplier what had to be done by them.
- Now several countries are moving in the direction of functional contracts, so it is not necessary to describe the material itself in detail and Highway Authorities are more and more prescribing end performance requirements of what they actually want the road and the road surface to achieve in terms of technical and performance characteristics, leaving the industry to come up with the appropriate solution.
- So, in short – a risk transfer to the industry can be observed.
- By going in this direction the supplier/contractor needs to be able to produce an end product that will achieve the performance requirements set. This means that the contractor needs to have more comprehensive knowledge of all aspects of design and performance. Therefore

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risk assessment has, and will continue to become extremely important and the industry and its suppliers need to collaborate more to understand and cater for these risks.

Asphalt mixtures

In terms of Asphalt mixes many new products have been developed in the last 20 to 30 years. In the past different types of Asphalt Concrete were used. Nowadays more dedicated mixtures are used with specific characteristics like:

- Stone Mastic Asphalt (SMA) for noise reducing, stable and durable road surface layers
- Porous Asphalt for noise reduction
- Double Layer Porous Asphalt for even a higher noise reduction
- High performance mixes for special applications
- Very thin layers of asphalt concrete and ultra thin layers of asphalt concrete for a good skid resistance and a low noise level.
- High Modulus Asphalt to reduce the pavement thickness.

So now a wide variety of mixes is available and the choice of the asphalt mixture depends on the requirements of the client, such as; noise reduction, durability, high skid-resistance, colour, or surface drainage to reduce splash and spray.

All these mixtures show that today's asphalt industry has a wide range of products to suit the modern discerning client!

New requirements for the road surfaces

Because of the increasingly intensive use of the roads it is getting more difficult to maintain them. This development has led to more durable roads and road surfaces.

The road authorities now want less maintenance of the road. So more durable pavements are needed and fast maintenance techniques to avoid hold ups and disturbance to traffic flows, particularly on our more principle roads.

The second new requirement is an environmental one. Environmental friendly solutions and sustainability are becoming key-words. There is a vastly increased need to lower energy consumption, increase the re-use & recycling of suitable material and new techniques to produce energy.

In order to have less maintenance and to increase sustainability, the concept of Long Life Pavements was developed. This means when roads are built, they should be built in such a way that they will last "forever". Only a replacement of the surface layers should be sufficient to provide the road user a high quality road surface.

To reduce the maintenance of the road surface, the durability of the pavement surface layers should be high and increase, so there is the need for high quality pavements. SMA is a good example of a durable surface layer that, as well as reducing traffic noise, allows reduced carriageway possession widths and a faster resurfacing time period.

Energy and Carbon Footprint reduction

In the area of energy reduction several developments are taking place at this moment. The first one is Warm Mix Asphalt. For Warm Mix Asphalt (WMA) a lower production temperature of asphalt is required and this reduces the energy needed to produce the asphalt mix and also its carbon footprint.

Warm Mix Asphalt technology not only leads to energy reduction, it also creates a cooler working environment for the asphalt workers and the road can be opened or re-opened for traffic at an earlier stage.

Several techniques have been developed to reduce asphalt production and application temperatures.

Depending on the chosen technology, a reduction in the asphalt mixing temperature of up to 30° C and more can be achieved.

The second way to reduce the Carbon Footprint (and to reduce the use of primary materials) is the use of Reclaimed Asphalt Pavements (RAP) for the production of asphalt. The recycling technique itself is more than 35 years old but still new techniques are being developed. In some countries the use of 60% RAP in Asphalt Concrete is common practice. Certain techniques can go even higher; up to 100%.

Asphalt is 100% recyclable and the asphalt industry is proud of being able to use all the RAP that is becoming available during renovation works.

Further new techniques are being developed so as to use dryer aggregate, by covering the stock piles or by using a crusher connected to the asphalt plant. There are even techniques being developed to recover heat (energy) out of the asphalt pavements.

This could be done by leading water through pipes in the pavement. This technique is already several years old. The “cool” water from the earth going through the warm or hot asphalt pavement in the summer extracts the heat from the pavement and this heated warm water can be stored in the ground in aquifers. In wintertime this heat (warm water) can be used to heat buildings. If desired, one can use the cold water first to cool the buildings in summer time before leading it through the pavement where it extracts the heat from the pavement. In this way the buildings are cooled in summertime and in wintertime they are heated. After having heated the buildings in wintertime the “cooled water” can be sent through the pavement again and heat the pavement somewhat to reduce winter maintenance activities.

A new technique that is being developed at this moment is the use of piezoelectric elements in the pavement that generate electricity when vehicles pass the road. The newest technique being developed is a sprayable nano-based solar technology that creates energy by using heat, light, and magnetism.

Developments in paving techniques

Several new paving techniques have also been developed to improve the durability and the quality of the surface layers. Good examples are “Compact asphalt” as well as “Intelligent compaction” and “Material Transfer Vehicles”.

“Compact asphalt” is a new asphalt paving technique developed in Germany. Here two asphalt layers are paved at the same time with one paver (with two screeds).

In this way a thin top layer can be paved on a thicker binder layer simultaneously. So the high quality top layer can be thin, and by paving it together with the thicker binder layer the bond between these layers is perfect and by having that thicker layer there is enough time for a good compaction of both layers. By having a thinner top layer, the costs for the high quality aggregate for that surface layer can be reduced too.

For “Intelligent compaction” modern electronic equipment is used on the roller so the roller driver gets immediate information about the compaction achieved along the laid material. In this way a better and more uniform compaction can be achieved and in the end this will lead to better durability.

By using “Material Transfer Vehicles (MTV)” the hot mix delivered by lorry is remixed in the MTV before going into the hopper of the paver. In this way the asphalt mixture fed

into the paver is a more homogeneous mixture in terms of gradation and temperature. It reduces mixture and temperature segregation and the result is a more durable road surface layer. By having a continuous feed to the paver, there is no need for the paver to stop and this also improves the longitudinal evenness of the road.

Conclusions

For various reasons the road users often do not realise all the innovations that are taken place in the asphalt industry. The first reason is that they often do not see them. When noise reduction and splash and spray reduction of Porous Asphalt are explained to them by giving example of roads where Porous Asphalt is used, they do realise the advantages and they are really enthusiastic about these great road surfaces; they love them.

Environmentalists often see asphalt companies as companies that are solely trying to pave the globe black. They do not realise that we reduce the fuel consumption of the vehicles using the roads by giving them a smooth surface with a low rolling resistance and they do not realise that asphalt is one of the few products that can be 100% recycled by just reheating the old reclaimed asphalt.

Everyone is using asphalt every day without realising the environmental benefits of this black and green product. We are green and we should show it to our road users.

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