

## Aggregate Industries

Asphalt technology evolution is fuelled by both academic and industry based research and Aggregate Industries is aiming to get the best of both through its work with external research partners.

# Progressive partnering

**W**orking with external research partners has enabled Aggregate Industries to adopt what the company believes to be a more practical approach to product development and advancement. Industry based trials have carried asphalt technology forward in recent years but independent research is also essential for gaining a different perspective to advance both performance and quality, it says.

Aggregate Industries began developing research partnerships with a number of leading academic institutions in the early 1990s and has jointly worked with research partners on a wide variety of topics. The company now has ongoing relationships with a number of universities as well as the British Textile Technology Group (BTTG), the Atomic Energy Authority (AEA) and the Building Research Establishment (BRE).

Before developing its network of external research partners Aggregate Industries used to work closely with local authorities and consultants to

prove its products. For example the company collaborated with Doncaster Council and consulting engineer Scott Wilson plus bitumen specialist Nynas to develop its thin overlay material Hitex.

"This approach is ideal for trialing new products but if these do not perform as we would expect, further research into what actually happens is essential," says Aggregate Industries technical director Paul Phillips. "Through joint research in association with independent organisations, products can be adapted to overcome problems and can also be the source of new cutting edge ideas as well."

Prescriptively designed materials used to dominate the asphalt industry but the quest for best value has led to wide spread adoption of performance based products instead. Development of non-recipe based materials has only been made possible by in depth understanding and knowledge of asphalt properties gained through research.

However, it seems that industry based research alone is not enough to gain a complete insight into the nature and characteristics of asphalt products which is key to the successful design of high grade materials.

"We as an industry naturally have a very commercial view of our objectives and often tend to focus too closely on the cost benefits of research rather than the potential to further asphalt science," says Phillips.

"External research partners, such as universities, can have less of a commercial interest and carry out research for scientific reasons. This can offer a great deal to asphalt companies in terms of developing greater understanding of how their products work."

Phillips says Aggregate Industries' first venture into joint research was with Ulster University: "We wanted to find out more about specifications and the performance of porous asphalt material and to try and solve the drainage problems which had been experienced at some sites. We chose to work with Ulster because it has a good track record in practical highway related research which suited our approach to work."

The study revealed that the biggest cause of the porous asphalt difficulties was the lack of design elements to accommodate individual applications. Other problems with porous asphalt were also highlighted in the study, such as the high cost which stems from use of large volumes of expensive high PSV aggregate in the material.



Ulster's results may not have been good news for porous asphalt per se but the joint research programme included study of viable alternatives which led to the development of Thinpave, Aggregate Industries' ultra thin surfacing product for highspeed applications.

Ulster has also completed studies on cold mix asphalt and stone mastic asphalt (SMA) in partnership with Aggregate Industries. The two are currently conducting further research into pavement testing, use of recycled materials and skid grip prediction.

"Working with external research partners means that the results and adapted products which are produced by the research are far more credible," says Phillips. "We have found that local authorities are more amenable to early use of products where they have a better understanding of its capabilities and characteristics."

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**Paul Phillips**

Other research programmes currently under way include a study into the colour fastness of coloured asphalt with BTTG. Phillips says: "BTTG normally works within the textile industry but after some initial discussions we felt the asphalt industry could learn a great deal about quality control and prediction of colour fastness from the clothing industry."

BTTG's joint research programme with Aggregate Industries began in 1998 and is due to be complete later this year. It has focused on why binders become opaque over time and how this process can be slowed down or even prevented.

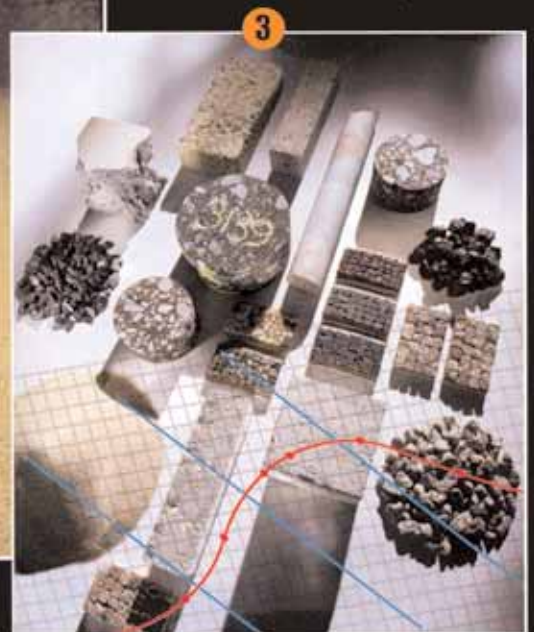
"Another of our ongoing study partnerships is with Heriot Watt University and is concerned with investigating the implications of volumetric design of asphalt," says Phillips. "Asphalts are usually designed by mass but volume can have a big influence on the product. For example, for a given mass with a uniform composition, the volume of binder will increase as the density of the selected aggregate increases, altering the composition of the mix.



**1**  
Aggregate Industries is also closely involved with the Industry and Parliament Trust (IPT) Initiatives which aim to build a greater understanding between the two parties. Through the IPT the company arranged for the Labour MP for Cunningham South Brian Donohoe to visit Ulster University and is pictured right with Aggregate Industries technical director Paul Phillips (left) and Professor Alan Woodside from Ulster University (centre).

**2. Colour fastness and pigment stability is currently being jointly researched by Aggregate Industries and its research partner, the British Textile Technology Group.**

**3. According to Aggregate Industries' independent research is an essential part of asphalt technology and product development.**



"By using volumetric design in asphalt specifications it is possible to maintain the binder to aggregate ratio, even if the type of aggregate is altered," he says. "Use of mass based specification has been one of the causes of texture loss in SMA, so a change to volumetric design could prevent further problems."

Aggregate Industries is currently planning to further its research in a number of areas including outcome specifications, non destructive testing and use of recycled materials such as plastic in asphalt mixes.

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