

# CORRECT COAL DISTRIBUTION TO BURNERS - THE GREENBANK VARIABLE AREA SPLITTER

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Greenbank Terotech, in partnership with Nottingham University (GAIM), have developed a revolutionary non-intrusive rope breaker for Pulverised coal. The purpose of this device is to break the 'rope' which is the tight formation of coal dust in air when transporting coal from mill to burner.

This is particularly crucial for many 'mature' power stations, which often have one or two large pipes coming from the mill that split to deliver fuel to 6 or 8 burners. Due to this rope formation, coal does not split as equally as the air at these pipe junctions, which results in poor fuel to air distribution. Correcting this can :

- **Optimise performance of low NOx burners via their fuel / air diet.**
- **Lower NOx and improve combustion efficiency / un-burnt carbon.**
- **Massive potential on front wall boilers that experience poor combustion**

BEFORE



INSIDE ROPE BREAKER



The above pictures are taken from Greenbank's 1/3 scale Pulverised Coal visualisation test rig at the university. For safety, the material used is glass beads with similar size characteristics, air ratio and velocity to power station ground coal.

The first picture shows inside a 'normal' section of pipe directly after a bend. The rope is clearly visible, with a fainter rope behind which is actually due to the previous upstream bend.

The rope breaker, which is non-intrusive, directly replaced the 2 x diameter long section of pipe, and the picture shows the rope broken inside the device.

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**SYSTEMS DIVISION – POWER APPLICATIONS**



## GREENBANK VAS PF DISTRIBUTOR

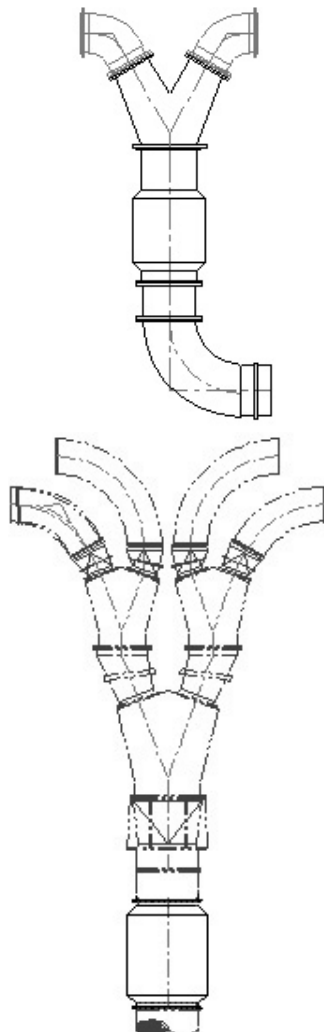
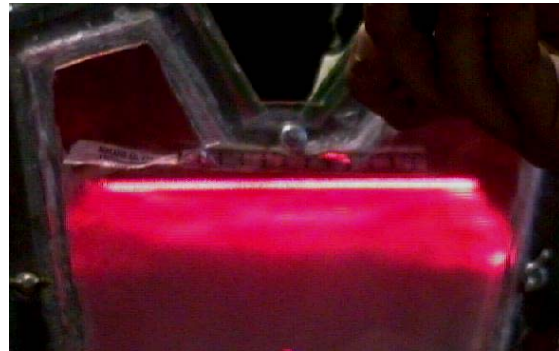
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The picture on the left, shows a laser sheet that depicts material concentration 1 diameter after the rope breaker, and it can be seen that the distribution is fairly even.



The pictures below show a typical 2 way split (bifurcation) without any riffle packs. The laser sheet highlights the even distribution at this junction (ignore the laser light reflections on the glass surface).



### UK Power Station applications

The patented rope breaker is being evaluated at 3 UK power stations, on pipe sizes varying from 14 to 36 inches diameter. The typical installation is shown in the drawing.

Feedback from power station experience, has shown that the existing riffle splitters do not last or perform consistently for the full time between outages.

Localised wear due to the concentrated rope can see the riffle pack worn in only 10 % of its area, and the ability to deliver a 50:50 split is made difficult due to the localised concentration of coal.

UK stations that have ordered the VAS system have elected to leave existing riffle packs in-place, as a more homogeneous mixture of fuel spread across the whole pipe cross section will allow riffle packs to function

The first application is shown left, where the rope breaker is applied before the primary riffle / split to homogenise the fuel before distribution.

Please contact Greenbank for expertise in fuel distribution to optimise your combustion and environmental performance of your boiler.