Transcript of Smoking Behaviour video

One important area of science needed to help in the development of potential reduced exposure products, and to more fully understand conventional tobacco products, is research into smoking behaviour. It is well known that smoking behaviour can vary both from occasion to occasion for any individual smoker - and between smokers. The factors influencing this variability are less well known.

Much of our research in this area is focused on developing methodologies that allow the recording of smoking behaviour in as unobtrusive a manner as possible, something that is quite difficult to achieve. In laboratory studies we can use specifically designed equipment to record parameters related to smoking behaviour.

One of these is the LifeShirt which allows an assessment of a smoker's respiratory parameters including inhalation volumes and duration.

The Smoking Analyser, currently on its seventh version and known as the SA7, is a device we have developed that records the shape of each puff taken by a smoker by sensing pressure differences.

Through this a recording of the actual puff profiles can be made as a smoker smokes a particular cigarette. Once recorded the profiles can be analysed to observe a variety of smoking behaviour characteristics such as puff by puff volumes and duration. The recorded profiles can also be used to drive a smoking machine to smoke exactly as the smoker did, allowing an assessment of the smoke emissions that the smoker would have taken from the cigarette.

However, the SA7 inherently alters the smoker's behaviour as the cigarette has to be smoked through a mouth piece, and we have found that general laboratory studies typically result in subjects exhibiting more intensive smoking behaviours than when smokers smoke in their normal environment.

In addition it is difficult to undertake laboratory studies with large numbers of smokers, something that is important to do because of the wide variability in smoking behaviour. Because of this we have further developed a technique called filter analysis.

The objective of filter studies is to estimate the actual amounts of tar and nicotine taken by smokers through an analysis of their smoked cigarette filters.

Smokers are asked to smoke normally but carry around a filter collector. The filter cutter is used to cut a tip section of 10 mm from the mouth-end of a smoked cigarette filter, and store it safely for later analysis.

In large studies simple cutters are used that collect all of the filter tips from an individual smoker and combine them. While in more specialised studies where it is important to measure single tips, we use a larger collector that combines a cutter

with a data logger that records the time that each filter was collected alongside ambient temperature and relative humidity data.

The tips are returned to the laboratory where they are measured using electronic callipers, and then constituents trapped on the filters such as nicotine are extracted by shaking in a solvent.. Following extraction, samples are put into vials and then analysed for nicotine by gas chromatography.

To estimate the nicotine taken by the smoker, the same design of cigarette are smoked on a smoking machine using a variety of smoking regimes to represent a wide range of smoking behaviour.

This enables us to produce a calibration curve from which we can estimate the amount of nicotine taken in by the smoker. The technique produces an upper estimate of the nicotine taken by the smoker, as it does not account for any smoke that may drift from the smokers mouth during the puffing process.

Nevertheless, in clinical studies we carried out in 2007 the filter analysis technique has been shown to correlate well to biomarkers of exposure such as salivary cotinine and nicotine metabolites in smokers urine.