

# Revolutionary 'lab-on-a-chip' Micro-GasChromatograph for a cost-effective monitoring of Natural Gas

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**INTRODUCTION:** Recently Pollution S.r.l. has been awarded by European Union for its revolutionary project in the Horizon 2020 SME Instrument research and innovation programme. The aim of this project is to develop a new MEMS-based analytical device, named picoGC. PicoGC integrates in a chip level injector, analytical column and detector capable to obtain the best performances never achieved by currently MicroGC analysis. In collaboration with key partners such as CNR-IMM (Italian research Council - Institute for Microelectronics and Microsystems), MEGA (experienced manufacturer of GC columns) and Micronit GmbH (silicon foundry), Pollution will develop the picoGC specifically dedicated for applications in the natural gas field: Lower Heating Value calculation, odorants control and mud logging analyses.

## WHY picoGC IS GOING TO REVOLUTIONIZE THE NATURAL GAS ANALYSIS AND CONTROL?

- **Control of odorants (for N.G Distributors and Transporters)**

Many measuring systems do not have enough sensitivity to detect very low levels for certain odorants, and none is today capable of determining EVERY type of odorants; **picoGC DOES**

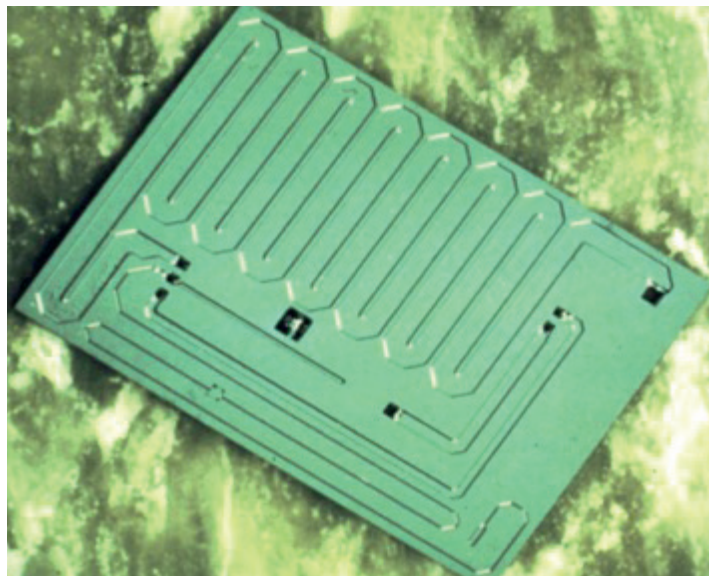

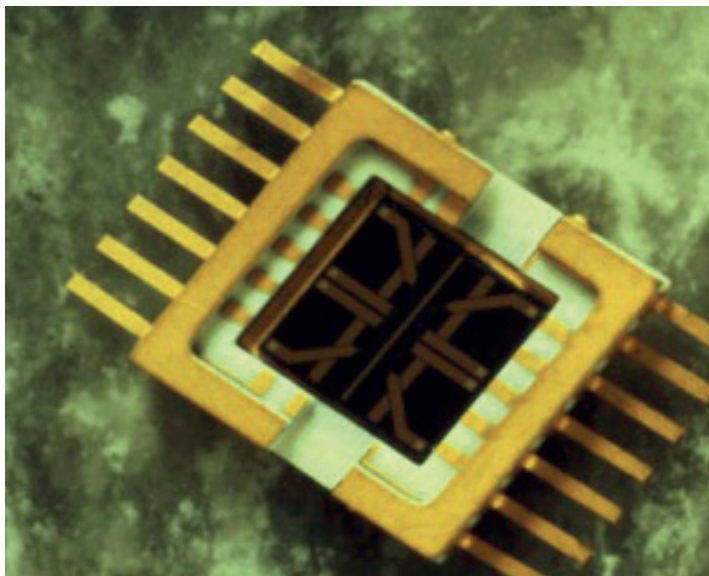
- **Analysis of N.G composition and Lower Heating Value (for N.G Distributors and Transporters)**

Variations in natural gas composition can affect the emissivity of the gas-flame, what may reduce the heattransfer capacity and increase energy consumption. Moreover natural gas in the pipeline contains also other components such as sulphur compounds and water vapour which may cause corrosion or condensation problems in the pipeline.

**picoGC will allow a more precise control in real-time of the LHV and N.G. composition, favouring a more efficient combustion process and pipeline integrity**

- **Analysis of N.G composition in Mud Logging (for E&P Service Companies)**

Mud-loggers need to get very precise analysis of samples in real-time in order to justify decisions in a tight-timely manner. Current measurement technology is used at rig-site but at the surface level, in a sheltered laboratory using benchtop gas chromatographs (with long analysis time of several minutes) which are unstable and not shock-resistant for in-situ measurements. **Main advantages of picoGC are its unbeatable analysis speed (few seconds), great precision, its robustness and its small size.**

	1. Injector MEMS based	2a. Column traditional capillary	3. Detector TCD MEMS based
Current cutting-edge Technology			
	2b. Column - MEMS based		
picoGC Technology	