

CIREXX DEVELOPS PCB & FLEX CIRCUITS FOR SEVERE DOWN HOLE APPLICATIONS

CLIENT / INDUSTRY

Oil & Gas Exploration
Company

PROJECT SIZE

\$250,000 Project
Multiple Units

THE CLIENT

A large oil & gas exploration and production company headquartered in Texas, with operations all over the globe. Years of in-house expertise in the design of printed circuit board and flex circuits for exploration and production "Down Hole" equipment in harsh environments.

INTRODUCTION

The customer had a need to put more electronic functionality - with greater sophistication - "down hole" near the drill tool for more accurate and rapid data measurement gathering and analyzation. Ultimately, this would make their drilling and exploration operations much more efficient, saving them a great deal of time and money.

NEEDS ASSESSMENT

The customer's problem was that standard Printed Circuit Board and Flex circuit materials would not survive the harsh "Down Hole" environment. They needed an interconnect - circuit board, flexible or rigid - that would survive the high temperatures (250°C+) and exposure to lubrication and flushing fluids in hole over many hours of continuous operation. The solution also had to be commercially available across common markets economically matched with already stringent price points in production.

"The client need an interconnect solution that would survive the high temperatures (250°C+) and continuous operation."

Develop an Experimental Plan designed to isolate the best material and process combinations with potential success for these applications

Develop Stack Ups with DuPont HT (high temperature) material and Arlon NT in various configurations with appropriate presses and methods

Include in the Test Vehicle design interconnection schemes to support the eventual assembly of sophisticated ICs and passive components

Fabricate test vehicle configurations in a DOE methodology and measure, test, validate and categorize the results for Circuit Boards and Flex Circuits

Determine and report on the best combination of materials for each application which will not only meet the performance criteria, but also the commercial and economic requirements

SOLUTIONS

Cirexx performed all the tasks in a QUICK TURN mode, rapidly producing results that allowed both companies engineers to proceed swiftly through the Experimental Plan and kept diligent records throughout to add to the empirical database. Cirexx relied on the work that they had done in conjunction with DuPont during the development of the HT material to form a basis for how it could be used in this application.

“Cirexx helped develop a material combination, employing HT material, and a Flex circuit design that can operate continuously for days.”

FINAL OUTCOME

Cirexx and the customer have developed interconnects, employing DuPont HT and Arlon NT material that can be used in severe Down Hole environments to survive the exposure and operate continuously for days. And while the itemized product costs of the PCBs are slightly higher than the replaced designs, the gains in overall production efficiency make it a 'no brainer' for the customer.

“HT” is registered trademark of E.I. DuPont de Nemours Company
“NY” is a registered trademark of Arlon Electronic Materials

HIGHLIGHTS

- Cirexx understood the problem and developed an Experimental Plan to assess options and isolate the best solution
- Cirexx had the resources – technology, facilities and methods – to respond effectively and quickly
- Cirexx solution was cost effective in a price sensitive market