مـؤسسة الـكويت للـتقدم الـعلمي
Kuwait Foundation for the Advancement of Sciences

Enterprise Support Success Story Form

Please return the completed form to:

Innovation & Enterprise Directorate
Kuwait Foundation for the Advancement of Sciences

E-mail: enterprisesupport@kfas.org.kw

(Subject: Co-Funding Support for In-House R&D Application)

Tel: 22278100 Ext: 1877

EQUATE Petrochemical

FEASIBILITY STUDY for Using Polyethylene and Polypropylene Material In 3D Printing Technology

Please use the questions below as a guide in composing your success story:

BRIEF DESCRIPTION OF THE COMPANY

The EQUATE Group* is a global producer of petrochemicals and the world's second largest producer of Ethylene Glycol (EG).

The Group has industrial complexes in Kuwait, North America and Europe that annually produce over 5 million tons of Ethylene, EG, Polyethylene (PE) and Polyethylene Terephthalate (PET). The products are marketed throughout Asia, the Americas, Europe, the Middle East and Africa.

The EQUATE Group's shareholders include Petrochemical Industries Company (PIC), The Dow Chemical Company (Dow), Boubyan Petrochemical Company (BPC) and Qurain Petrochemical Industries Company (QPIC).

The Group is a leading enterprise that pursues sustainability wherever it operates through partnerships in fields that include the environment, economy and society. www.equate.com

HOW DID YOU FIND OUT ABOUT KFAS, AND THE ENTERPRISE SUPPORT PROGRAM?

Dr. Lobna Okashah introduced KFAS program during one of local seminar

WHAT WAS THE PROBLEM YOU WERE TRYING TO SOLVE?

Explore the opportunity of using Polyethylene and Polypropylene in 3D printing technology

RESEARCH INSTITUTION

Fraunhofer Institute for Machine Tools and Forming Technology IWU- Germany

PROJECT DESCRIPTION

This feasibility study report is for the development of value added Polyethylene (PE) and Polypropylene (PP) materials for 3D printing technology such as SLS and FLM method of processing. The methodology adopted in this study is to conduct a "Market Survey" with current convertors and end users of 3D printing material. For this purpose, several end users such as Automobile, Aerospace and industrial users were contacted. The study was conducted by Fraunhofer IWU institute. The study showed that PP has a limited market and there is no existing market for PE based material in 3D printing application as the preferred materials are ABS, PLA and Nylon. This is due to high shrinkage and poor mechanical properties of PE and PP that prevents its use in such applications. However, convertors and end users are willing to evaluate a modified PE and PP that is cheaper than existing material and meet all the functional requirements. This need a long-term study to improve the properties of PE by modifying it with fillers and fibers. While the economics of PE grade production is favorable, non-existing market and uncertainty of developing suitable grade would be a deterrent for proceeding further in this project

HOW DID KFAS HELP WITH YOUR PROJECT?

Through setting meeting with research institute

TO WHAT EXTENT DID KFAS ADD ADDITIONAL VALUE TO YOUR PROJECT?

Assisted in identifying alternative customers and new markets for EQUATE & PIC products.

WHAT WAS THE STI RELATED SOLUTION NEEDED FOR YOUR PROJECT? FOR EXAMPLE, IT ADDRESSED ONE OR MORE OF THE FOLLOWING ITEMS:

☐ Testing of new, advanced technology material
☐ Environmental solutions
☐ Less consumption of raw material, and / or more efficient production
☐ Increase in profitability
☐ IT solution
☐ New service for customers (e.g. financial service)

☒ Other – please mention below:
Evaluating new technology and assess market trends

WORKING WITH THE RESEARCH INSTITUTE

The methodology adopted for this study is through "Open Innovation" and here we have contacted technology providers such as SET and through them connected to research institutes to identify areas of collaboration. The interaction with the identified institutes was done though conference calls and exchanging presentations on nature work, areas of interest, recent developments, publications and interactions with industry. Based on this, a visit of the technology provider was made by us for understanding our requirements. Together with the technology provider, we collected necessary information for making this feasibility study and technical proposal. The identified technology provider list is given below

PROJECT IMPACT

Provide information that help us to take a decision for investing on new technology

WOULD YOU REAPPLY TO A KFAS PROGRAM?

☒ Yes
☐ No

BECAUSE OF THIS PROJECT, ARE YOU LIKELY TO INVEST FURTHER IN RESEARCH & DEVELOPMENT?

We have already R&D programs that focus on all research and development related to our products

WOULD YOU RECOMMEND KFAS PROGRAMS TO OTHER COMPANIES?

I recommend KAFS programs include the following industrial segments:

- Downstream for Petrochemical industry
- Food industry
- Waste handling technologies