Talk on " ETFE – Building Envelopes "

by Ir. Yasotha Chetty

Ir. Yasotha Chetty is currently a committee member in the Civil and Structural Engineering Technical Division (CSETD).

This talk by Matthew Penrose of Vector Foiltec gave an introduction to the technology, details and advantages for ETFE structures.

ETFE (ethylene tetraflouroethylene) is a flouropolymer product. In foil form, it can be used roofs, atrium, facades and canopies. Vector Foiltec's ETFE system combines between two and five layers of ETFE foil to form air pressure stabilised cladding panels or a single layer system. The ETFE foils can be transparent, coloured or printed. The number of layers used in a panel depends on project specific requirements for structural and thermal performance. The ETFE foils are extruded in rolls typically 1,550mm wide and between 200m and 500m long. The thickness of individual foil layers can vary between 80 µm and 300 µm depending on the mechanical performance required for given loading conditions. Each layer of a ETFE cladding panel is made up of smaller elements cut from the foil rolls to a predetermined design by a computer controlled plotting machine and welded together to form a single sheet. The required number of layers are then sealed one to another and by welding them around the perimeter to a strip of foil folded over a 'keder' rod or rope. This perimeter assembly provides the means of structural connection between the ETFE panel and the perimeter framing.

In addition to understanding the system, Matthew also presented a showcase of projects in the Southeast Asia region where EFTE is being used and a case study of the design of Singapore National Stadium's moving roof structure which has EFTE roofing.