Vertical tray columns are used widely in refineries and other chemical plants to carry out separation of hydrocarbons and other compounds by unit operations like distillation, gas absorption and gas stripping and for humidification and de-humidification operations. Vertical tray columns of 30-40 feet height are common in chemical plants. Sometimes these vertical tray columns are more than 50 feet high. Transportation of these columns is costly and installation, operation, maintenance and troubleshooting of these columns require difficult and unsafe aerial jobs.

A new invention has been developed to carrying out all kinds of distillation and other gas-liquid contact operations in horizontal equipment instead of presently in-practice tall vertical tray columns. The horizontal design of the invention makes it extremely inexpensive, easy and safe to transport, install,
operate, maintain and troubleshoot, compared with an equivalent vertical tray distillation column. The invention is more operationally flexible in comparison with equivalent vertical tray column and operates within a swelled operating region on vapor flow rate vs. liquid flow rate plot in comparison with equivalent vertical tray distillation column reducing the turn-down time due to varied loads. Additionally, a vertical tray distillation column has to be designed considering dead loads, seismic loads and wind loads due to its vertical design. The present invention can be designed without considering dead loads, seismic loads and wind loads due to its horizontal design. Also, a costly foundation needs to be laid, ladders need to be added and intermediate supports are required to support a vertical tray distillation column. These components can be avoided for the present invention due to its horizontal design. This results in reduced capital cost for the present invention. The invention can be manufactured in modular form in the factory instead of at site saving enormous amount of time and money. All regulatory permissions and compliances required for vertical tray columns can be avoided for the invention saving time and money.

A US patent number 9855515 B2 and a UK patent number 2514525 B has been granted to the invention and an Indian patent is pending. Companies interested in licensing the technology are being sought. For licensing, patent documents or more information regarding the technology, kindly contact the inventor of the technology, Mr Amit Katyal, at amit@eq-comp.com.