SUMMARY ~~OF THE INVENTION~~

~~One aspect of the invention~~The disclosure provides a method for uniformly distributing a process liquid within a process vessel, comprising;

a) providing a process liquid to a fouling-resistant liquid distributor comprising a liquid distribution head, installed within a process vessel having a cross- sectional area;

b) causing rotational movement of the fouling-resistant liquid distributor; and

c) uniformly distributing the process liquid over the cross-sectional area within the process vessel.

In an aspect, there is provided a method for uniformly distributing a process liquid within a process vessel, comprising:

a. providing a process liquid to at least one fouling-resistant liquid distributor comprising a liquid distribution head, installed within a process vessel having a cross-sectional area;

b. causing rotational movement of the fouling-resistant liquid distributor; and

c. uniformly distributing the process liquid over the cross-sectional area within the process vessel;

the said method further comprising at least one of:

simultaneously self-rinsing the at least one fouling-resistant liquid distributor with a portion of the process liquid during step (c), and

providing the process liquid during step (c) to a plurality of the fouling-resistant liquid distributors, wherein each of the fouling-resistant liquid distributors simultaneously rinses each other with a portion of the process liquid during step (c).

The method of the disclosure~~invention~~ further comprises simultaneously self-rinsing the at least one fouling-resistant liquid distributor with a portion of the process liquid during step (c) and/or providing the process liquid during step (c) to a plurality of the fouling-

resistant liquid distributors, wherein each of the fouling-resistant liquid distributors simultaneously rinse each other with a portion of the process liquid during step (c).

The simultaneously self-rinsing of the fouling-resistant liquid distributor with a portion of the process liquid during uniform distribution has never been disclosed nor suggested in prior art.

Another embodimentaspect of the inventiondisclosure, the rotational movement in step (b) is achieved by supplying at least one of a motive fluid and the process liquid to the liquid distribution head.

Yet another aspectembodiment, the process vessel is a (meth)acrylic monomer process vessel and the process liquid comprises one or more polymerization inhibitors.

Another aspect of the present invention The disclosure also provides a system for uniformly distributing a process liquid within a process vessel comprising a supply of process fluid, a stationary conduit, and a liquid distribution head attached to the conduit, preferably to an end of the stationary conduit. The liquid distribution head is motive, powered by a fluid, preferably

by the process fluid, and comprises at least one process liquid delivery port, preferably a plurality of liquid delivery ports. The at least one process liquid delivery port is configured to provide a +10° or greater angle of liquid coverage when the liquid distribution head is moving.

In another aspect, there is provided a system for uniformly distributing a process liquid within a process vessel, comprising:

a. a supply of process fluid,

b. a stationary conduit, and

c. a liquid distribution head attached to said conduit, wherein said liquid distribution head is motive, powered by a fluid, and comprises at least one process liquid delivery port, and

wherein the at least one process liquid delivery port is configured to provide a +10° or greater angle of liquid coverage of the process fluid when the liquid distribution head is moving.

Yet another aspect of the present ~~invention~~ disclosure provides a process vessel comprising the said system.

Yet another ~~aspect~~ embodiment of the present disclosure~~invention~~ provides a simple and cost effective method for uniformly distributing liquid over the internal cross-section of (meth)acrylic monomer vapor-liquid contacting vessels, without accumulating condensation polymer on the distribution equipment.

Yet another ~~aspect~~ embodiment of the present ~~invention~~disclosure provides a method for collateral wetting of process-facing surfaces within the vapor space of (meth)acrylic monomer process vessels, such as quench vessels, absorbers, contact condensers, scrubbers, heat exchangers, distillation columns, reactors, and storage tanks to further reduce the potential for polymer accumulation within process vessels.

In another aspect, there is provided the use of the process vessel as defined above, for producing (meth)acrylic monomers.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be more fully understood, the following figures are provided by way of illustration, in which:

Figure 1 illustrates a vapor-liquid contacting vessel incorporating an embodiment of the present invention;

Figures 2A-2G depict types of distributors which may be incorporated in various embodiments of the present invention;

Figure 3 shows a vapor-liquid contacting vessel incorporating another embodiment of the present invention; and