SUMMARY OF THE DISCLOSURE

[0005] To minimize the limitations found in the existing systems and methods, and to minimize other limitations that will be apparent upon the reading of this specification, the preferred embodiment of the present invention provides a method and attachment assembly that may eliminate the amount of vibration in a quartz sleeve in an ultraviolet (UV) reactor.

[0005a] According to a first aspect of the present invention, there is provided an attachment assembly for supporting a quartz sleeve positioned inside an ultraviolet (UV) cylinder, the attachment assembly comprising: at least one vibration resistant member adaptable to support and prevent vibration of the quartz sleeve; a collar attachment member configured to enclose the at least one vibration resistant member; and a support plate configured to attach the collar attachment member containing the at least one vibration resistant member with the UV cylinder; wherein the at least one vibration resistant member enclosed by the collar attachment member contacts an outer surface of the quartz sleeve and is configured to guide the quartz sleeve therethrough and prevents vibration; and wherein the attachment assembly is configured to be mounted inside of the UV cylinder by means of a mounting means positioned at a fixed position at a distance away between a first end plate and a second end plate of the UV cylinder.

[0005b] According to a second aspect of the present invention, there is provided an attachment assembly for supporting a quartz sleeve positioned inside an ultraviolet (UV) cylinder for fluid treatment, the attachment assembly comprising: at least one vibration resistant member configured to support the quartz sleeve, the at least one vibration resistant member coupled to the surface of the quartz sleeve; a collar attachment member adaptable to enclose the at least one vibration resistant member, the at least one vibration resistant member enclosed by the collar attachment member such that there is no space left therebetween; and a support plate configured to attach the collar attachment member containing the at least one vibration resistant member with the UV cylinder; wherein the at least one vibration resistant member enclosed by the collar attachment member contacts an outer surface of the quartz sleeve and is configured to guide the quartz sleeve therethrough and holds it steady to prevent vibration; and wherein the attachment assembly is configured to be mounted inside of the UV cylinder by means of a mounting means

positioned at a fixed position at a distance away between a first end plate and a second end plate of the UV cylinder.

[0005c] According to a third aspect of the present invention, there is provided a method for utilizing an attachment assembly for reducing and preventing vibration of a quartz sleeve positioned inside an ultraviolet (UV) cylinder, the method comprising the steps of: a) providing the attachment assembly having at least one vibration resistant member enclosed by a collar attachment member connected with a support plate; b) mounting the attachment assembly to a ring positioned at a fixed location at a distance inside the UV cylinder such that the attachment assembly is mounted inside the UV cylinder between a first end plate and a second end plate of the UV cylinder; c) inserting the quartz sleeve into the UV cylinder through a first end plate of the UV cylinder; d) guiding the quartz sleeve through the at least one vibration resistant member enclosed by the collar attachment member; e) attaching the quartz sleeve with a second end plate of the UV cylinder; and f) holding and steadily supporting the quartz sleeve by the at least one vibration resistant member enclosed by the collar attachment member to prevent vibration.

[0006] The attachment assembly comprises at least one vibration resistant member, a collar attachment member and a support plate. The at least one vibration resistant member is adaptable to hold and support the quartz sleeve positioned inside a UV cylinder and thereby to prevent its vibration. The at least one vibration resistant member is an O-ring and is made from a material selected from a group consisting of: Teflon, rubber, elastomer, or a metal spring. The collar attachment member is configured to enclose the at least one vibration resistant member. The at least one vibration resistant member is positioned inside the collar attachment member. The at least one vibration resistant member is enclosed by the collar attachment member such that there is little to no space left therebetween and hence limits movement between the. members The support plate is configured to attach the collar attachment member containing the at least one vibration resistant member with the UV cylinder. The attachment assembly can be attached to the UV cylinder directly or can be attached to a ring positioned inside the UV cylinder. When the attachment assembly is attached inside with the UV cylinder, the quartz sleeve is guided through the at least one vibration resistant member from a first end plate to a second end plate of the UV cylinder. The attachment assembly is attached to a ring or directly on the inner side of the UV cylinder of a reactor holding the quartz sleeve.

[0007] The method for utilizing an attachment assembly for preventing vibration of a quartz sleeve positioned inside the UV cylinder comprises the steps of: providing the attachment assembly having at least one vibration resistant member enclosed by a collar attachment member connected with a support plate. Then mounting the attachment assembly to a ring positioned at a fixed location at a distance inside the UV cylinder. Inserting the quartz sleeve into the UV cylinder through a first end plate of the UV and guiding the quartz sleeve through the at least one vibration resistant member enclosed by

WHAT IS CLAIMED IS:

1. An attachment assembly for supporting a quartz sleeve positioned inside an ultraviolet (UV) cylinder, the attachment assembly comprising:

at least one vibration resistant member adaptable to support and prevent vibration of the quartz sleeve;

a collar attachment member configured to enclose the at least one vibration resistant member; and

a support plate configured to attach the collar attachment member containing the at least one vibration resistant member with the UV cylinder;

wherein the at least one vibration resistant member enclosed by the collar attachment member contacts an outer surface of the quartz sleeve and is configured to guide the quartz sleeve therethrough and prevents vibration; and

wherein the attachment assembly is configured to be mounted inside of the UV cylinder by means of a mounting means positioned at a fixed position at a distance between a first end plate and a second end plate of the UV cylinder.

2. The attachment assembly of claim 1 wherein the at least one vibration resistant member is an O-ring.

3. The attachment assembly of claim 1 wherein the at least one vibration resistant member is made from a material selected from the group consisting of: Teflon, rubber or elastomer.

4. The attachment assembly of claim 1 wherein the at least one vibration resistant member is in contact 360° around the outside surface of the quartz sleeve.

5. The attachment assembly of claim 1 wherein the at least one vibration resistant member maintains the quartz sleeve in a straight position.

6. The attachment assembly of claim 1 wherein the at least one vibration resistant member is enclosed by the collar attachment member such that there is substantially no gap left therebetween.

7. The attachment assembly of claim 1 wherein the configuration of the collar attachment member and the at least one vibration resistant member allows substantially no movement therebetween.

8. The attachment assembly of claim 1, wherein the attachment assembly is mounted directly inside the UV cylinder at a distance away from the first end plate and the second end plate.

9. An attachment assembly for supporting a quartz sleeve positioned inside an ultraviolet (UV) cylinder for fluid treatment, the attachment assembly comprising:

at least one vibration resistant member configured to support the quartz sleeve, the at least one vibration resistant member coupled to the surface of the quartz sleeve;

a collar attachment member adaptable to enclose the at least one vibration resistant member, the at least one vibration resistant member enclosed by the collar attachment member such that there is no space left therebetween; and

a support plate configured to attach the collar attachment member containing the at least one vibration resistant member with the UV cylinder;

wherein the at least one vibration resistant member enclosed by the collar attachment member contacts an outer surface of the quartz sleeve and is configured to guide the quartz sleeve therethrough and holds it steady to prevent vibration; and

wherein the attachment assembly is configured to be mounted inside of the UV cylinder by means of a mounting means positioned at a fixed position at a distance between a first end plate and a second end plate of the UV cylinder.

10. The attachment assembly of claim 9 wherein the at least one vibration resistant member is an O-ring.

11. The attachment assembly of claim 9 wherein the at least one vibration resistant member and the collar attachment member provide support and stability around the quartz sleeve.

12. The attachment assembly of claim 9 wherein the at least one vibration resistant member is made from a material selected from the group consisting of: Teflon, rubber or elastomer.

13. The attachment assembly of claim 9 wherein the at least one vibration resistant member maintains the quartz sleeve in a straight position.

14. The attachment assembly of claim 9 wherein the configuration of the collar attachment member and the at least one vibration resistant member allows substantially no natural movement therebetween.

15. The attachment assembly of claim 9, wherein the attachment assembly is mounted directly inside the UV cylinder at a distance away from the first end plate and the second end plate.

16. A method for utilizing an attachment assembly for reducing and preventing vibration of a quartz sleeve positioned inside an ultraviolet (UV) cylinder, the method comprising the steps of:

a) providing the attachment assembly having at least one vibration resistant member enclosed by a collar attachment member connected with a support plate;

b) mounting the attachment assembly to a ring positioned at a fixed location at a distance inside the UV cylinder such that the attachment assembly is mounted inside the UV cylinder between a first end plate and a second end plate of the UV cylinder;

c) inserting the quartz sleeve into the UV cylinder through a first end plate of the UV cylinder;

d) guiding the quartz sleeve through the at least one vibration resistant member enclosed by the collar attachment member;

e) attaching the quartz sleeve with a second end plate of the UV cylinder; and

f) holding and steadily supporting the quartz sleeve by the at least one vibration resistant member enclosed by the collar attachment member to prevent vibration.

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