and/or fluid acceleration during the injection process, reducing the efficacy of the polymer and potentially requiring more polymer to produce a desired result.

BRIEF DESCRIPTION OF THE DISCLOSURE

[0005] Certain examples commensurate in scope with the originally claimed embodiments are summarized below. These examples are not intended to limit the scope of the claimed embodiments, but rather these examples are intended only to provide a brief summary of possible forms of the disclosure. Indeed, the present disclosure may encompass a variety of forms that may be similar to or different from the examples set forth below.

[0005A] According to a first aspect, there may be provided a system, comprising: a subsea chemical injection system configured to inject a chemical into a well, wherein the subsea chemical injection system comprises: a subsea choke configured to flow the chemical; and a choke trim of the subsea choke, wherein the choke trim comprises a flow path having a length, the length is adjustable, and the flow path comprises a gradually decreasing cross-sectional area along at least half of the length, wherein the choke trim comprises at least one plate comprising a plurality of concentric rings, wherein each of the plurality of concentric rings is configured to rotate relative to one another, and each of the plurality of concentric rings comprises a flow path.

[0005B] According to a second aspect, there may be provided a system, comprising: a choke trim of a subsea choke configured to flow a chemical for injection into a subsea well, wherein the choke trim comprises a flow path having a length, the length comprises a taper extending at least half of the length, and the length is adjustable, and wherein the choke trim comprises: at least one plate, comprising: a central passage configured to receive a flow of the chemical; and a plurality of concentric rings, wherein each of the plurality of concentric rings is configured to rotate relative to one another, and each of the plurality of concentric rings comprises a flow path, wherein the plurality of concentric rings comprises: an innermost concentric ring comprising an entry port in fluid communication with the central passage, wherein the entry port is in fluid communication with the flow path of the innermost concentric ring; and an outermost concentric ring comprising an exit port configured to output the chemical, wherein a first ring of the plurality of concentric rings comprises a port extending from a first flow path of the first ring to a second flow path of a second ring of the plurality of concentric rings.

[0006] In one example, a system includes a subsea chemical injection system configured to inject a chemical into a well, wherein the subsea chemical injection system includes a subsea choke configured to flow the chemical and a choke trim of the subsea choke, wherein the choke trim comprises a flow path having a cross-sectional area and a length, and the cross-sectional area and length are each adjustable independent from one another.

[0007] In another example, a system includes a choke trim of a subsea choke configured to flow a chemical for injection into a subsea well, wherein the choke trim comprises a flow path having a cross-sectional area and a length, wherein the cross-sectional area and length are each adjustable independent from one another.

[0008] In a further example, a method includes adjusting a first position of a first component of a choke trim relative to a second component of the choke trim to adjust a cross-sectional area of a

flow path of the choke trim and adjusting a second position of a third component of the choke trim relative to a fourth component of the choke trim to adjust a length of the flow path of the choke trim, wherein the cross-sectional area and length are each adjustable independent from one another.

[0009] In another example, a system includes a subsea chemical injection system configured to inject a chemical into a well, wherein the subsea chemical injection system includes a subsea choke configured to flow the chemical and a choke trim of the subsea choke, wherein the choke trim comprises a flow path having a length, the length is adjustable, and the flow path comprises a gradually decreasing cross-sectional area along at least a portion of the length.

[0010] In another example, a system includes a choke trim of a subsea choke configured to flow a chemical for injection into a subsea well, wherein the choke trim includes a flow path having a length, and the length is adjustable.

[0011] In a further example, a method includes adjusting a position of a first component of a choke trim relative to a second component of the choke trim to adjust a length of a flow path of the choke trim.

[0012] In a further example, a system includes a subsea chemical injection system configured to inject a chemical into a well, wherein the subsea chemical injection system comprises a subsea choke configured to flow the chemical and a choke trim of the subsea choke. The choke trim comprises a first plurality of spiral flow paths, wherein each of the first plurality of spiral flow paths comprises a decreasing cross-sectional area from a respective inlet to a respective outlet of each of the first plurality of spiral flow paths.

[0013] In another example, a method includes directing a flow of a polymer solution through an inlet of a choke body, directing the flow of the polymer solution through a first plurality of spiral flow paths of a choke trim, and directing the flow of the polymer solution through a second plurality of spiral flow paths of the choke trim, wherein the second plurality of flow paths extend about the first plurality of spiral flow paths, wherein each of the first and second pluralities of spiral flow paths comprises a gradually decreasing cross-sectional area along a respective length of each of the first and second pluralities of spiral flow paths.

[0014] In a further example, a system includes a choke trim of a subsea choke configured to flow a chemical for injection into a subsea well, wherein the choke trim comprises a first cylinder comprising a first plurality of spiral flow paths, a second cylinder comprising a second plurality of spiral flow paths, wherein the first cylinder is disposed within the second cylinder, and an outer portion comprising a plurality of axial passages, wherein the second cylinder is disposed within the outer portion.

[0015] In another example, a system includes a subsea chemical injection system configured to inject a chemical into a well, wherein the subsea chemical injection system includes a subsea choke configured to flow the chemical and a choke trim of the subsea choke, wherein the choke trim comprises a porous material.

[0016] In another example, a method includes directing a flow of a polymer solution through an inlet of a choke body, directing the flow of the polymer solution through a porous element of a

choke trim disposed within the choke body, wherein the porous element comprises a sintered material, and directing the flow of the polymer solution through an outlet of the choke body.

[0017] In a further example, a system includes a choke trim of a subsea choke configured to flow a chemical for injection into a subsea well, wherein the choke trim comprises a porous material, and the porous material is formed from a sintering process.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] Various features, aspects, and advantages of the present disclosure will become better understood when the following detailed description is read with reference to the accompanying figures in which like characters represent like parts throughout the figures, wherein:

[0019] FIG. 1 is a schematic of an embodiment of a polymer injection system, in accordance with aspects of the present disclosure;

[0020] FIG. 2 is a cross-sectional side view of an embodiment of a low shear choke trim disposed within a choke of a polymer injection system, in accordance with aspects of the present disclosure;

CLAIMS

1. A system, comprising:

a subsea chemical injection system configured to inject a chemical into a well, wherein the subsea chemical injection system comprises:

a subsea choke configured to flow the chemical; and

a choke trim of the subsea choke, wherein the choke trim comprises a flow path having a length, the length is adjustable, and the flow path comprises a gradually decreasing cross-sectional area along at least half of the length, wherein the choke trim comprises at least one plate comprising a plurality of concentric rings, wherein each of the plurality of concentric rings is configured to rotate relative to one another, and each of the plurality of concentric rings comprises a flow path.

2. The system of claim 1, wherein a first ring of the plurality of concentric rings comprises a port extending from a first flow path of the first ring to a second flow path of a second ring of the plurality of concentric rings.

3. The system of claim 1, wherein the at least one plate comprises a central passage configured to receive a flow of the chemical, the plurality of concentric rings comprises an innermost concentric ring comprising an entry port in fluid communication with the central passage, and the entry port is in fluid communication with the flow path of the innermost concentric ring.

4. The system of claim 1, wherein the plurality of concentric rings comprises an outermost concentric ring comprising an exit port configured to output the chemical.

5. The system of claim 1, wherein the subsea chemical injection system comprises an actuator configured to actuate a component of the choke trim to adjust the cross-sectional area of the flow path.

6. The system of claim 5, wherein the component comprises a a first annular sheath disposed about the at least one plate.

7. The system of claim 1, wherein the cross-sectional area and length are each adjustable independent from one another.

8. A system, comprising:

a choke trim of a subsea choke configured to flow a chemical for injection into a subsea well, wherein the choke trim comprises a flow path having a length, the length comprises a taper extending at least half of the length, and the length is adjustable, and wherein the choke trim comprises:

at least one plate, comprising:

a central passage configured to receive a flow of the chemical; and

a plurality of concentric rings, wherein each of the plurality of concentric rings is configured to rotate relative to one another, and each of the plurality of concentric rings comprises a flow path, wherein the plurality of concentric rings comprises:

an innermost concentric ring comprising an entry port in fluid communication with the central passage, wherein the entry port is in fluid communication with the flow path of the innermost concentric ring; and

an outermost concentric ring comprising an exit port configured to output the chemical,

wherein a first ring of the plurality of concentric rings comprises a port extending from a first flow path of the first ring to a second flow path of a second ring of the plurality of concentric rings.