SAND CONTROL SCREEN ASSEMBLY HAVING A MECHANICALLY ATTACHED SCREEN JACKET

TECHNICAL FIELD OF THE INVENTION

[0001] This invention relates, in general, to equipment utilized in conjunction with operations performed in subterranean wells and, in particular, to a sand control screen assembly having a mechanically attached screen jacket.

BACKGROUND OF THE INVENTION

[0002] Without limiting the scope of the present invention, its background will be described with reference to producing fluid from a hydrocarbon bearing subterranean formation, as an example.

[0003] Since the beginning of oil production from subsurface formations, the industry has been concerned with efficient control of the movement of unconsolidated formation particles, such as sand, into the wellbore. For example, such formation movement commonly occurs during production from completions in loose sandstone or following hydraulic fracture of a formation. Production of these materials causes numerous problems in the operation of oil, gas or water wells. These problems include plugged formations, tubing and subsurface flow lines, as well as erosion of casing, downhole equipment and surface equipment. These problems lead to high maintenance costs and unacceptable well downtime. Accordingly, numerous methods have been utilized to control the movement of these unconsolidated formation particles during the production of fluids.

[0004] For example, one or more sand control screen assemblies are commonly included in the completion string to control the movement of formation particles. Such sand control screen assemblies are commonly constructed by installing one or more screen jackets on a perforated base pipe. The screen jackets may include one or more drainage layers, one or more screen elements such as a wire wrapped screen or single or multi layer wire mesh screen and a perforated outer shroud. Conventionally, screen jackets have been secured to the base pipe by welding.

[0005] It has been found, however, that the process of welding a screen jacket to a base pipe is sometimes very difficult due to the difference in metallurgy of the components. For example, the material used for the base pipe may be 13 chrome while the material used for

the screen jacket may be a special alloy such as 304L stainless steel, 316L stainless steel, Inconel, Hastelloy or Monel. In addition, it has been found that welding a screen jacket to a base pipe typically requires a post weld stress relief process which can be time consuming. Further, it has been found that welding a screen jacket to a base pipe can cause damage to the screen jacket resulting in numerous types of failures in the sand control screen assemblies.

[0006] Accordingly, a need has arisen for an apparatus for attaching a screen jacket to a base pipe that does not require welding incompatibly different materials. A need has also arisen for such an apparatus for attaching a screen jacket to a base pipe that does not require a post weld stress relief process. Further, a need has arisen for such an apparatus for attaching a screen jacket to a base pipe that does not result in damage to the screen jacket.

SUMMARY OF THE INVENTION

[0007] The present invention disclosed herein comprises a sand control screen assembly for preventing the inflow of formation particles during production. The sand control screen assembly of the present invention does not require welding incompatibly different materials to connect a screen jacket to the base pipe. In addition, the sand control screen assembly of the present invention does not require a post weld stress relief process or result in damage to the screen jacket.

[0008] In one aspect, the present invention is directed to a sand control screen assembly for use in a subterranean well. The sand control screen assembly includes a base pipe having an outer surface and at least one opening in a side wall portion thereof. A screen jacket is disposed around the base pipe. The screen jacket has a filter medium and an outer shroud. The outer shroud has first and second ends with inner and outer surfaces. Connector rings form a mechanical interface between the base pipe and the first and second ends, respectively, of the outer shroud. Each of the connector rings is operable to mechanically induce permanent deformation in the outer surface of the base pipe and at least one of the inner surface and the outer surface of the outer shroud, thereby connecting the screen jacket to the base pipe.

[0009] In one embodiment, the connector rings prevent longitudinal movement of the screen jacket relative to the base pipe. In another embodiment, the connector rings prevent rotational movement of the screen jacket relative to the base pipe. In certain embodiments, each connector ring is disposed between the outer surface of the base pipe and an inner surface of the outer shroud. In other embodiments, each connector ring is disposed around

the outer surface of the base pipe and an outer surface of the outer shroud. In one embodiment, the mechanically induced permanent deformation is achieved by crimping the connector rings to create penetrations into the base pipe and the outer shroud.

[0010] Preferably, the connector rings take the form of cylindrical rings having a cross sectional shape selected from the group consisting of a substantially rectangular shape, a substantially triangular shape and a substantially pyramidal shape. In some embodiments, the connector rings include spikes extending outwardly from an inner surface of the connector rings, an outer surface of the connector rings or both. In these embodiments the spikes may be removable inserts. In other embodiments, the connector rings include a plurality of friction riser extending outwardly from an inner surface of the connector rings, an outer surface of the connector rings or both.

[0011] In another aspect, the present invention is directed to a sand control screen assembly for use in a subterranean well. The sand control screen assembly includes a base pipe having an outer surface and at least one opening in a side wall portion thereof. A screen jacket is disposed around the base pipe. The screen jacket has a filter medium and an outer shroud. The outer shroud has first and second ends with inner surfaces. Connector rings are disposed between the base pipe and the first and second ends, respectively, of the outer shroud. Each of the connector rings is operably connected to the inner surface of the outer shroud and operable to mechanically induce permanent deformation in the outer surface of the base pipe, thereby connecting the screen jacket to the base pipe.

[0012] In a further aspect, the present invention is directed to a sand control screen assembly for use in a subterranean well. The sand control screen assembly includes a base pipe having an outer surface and at least one opening in a side wall portion thereof. A screen jacket is disposed around the base pipe. The screen jacket has a filter medium and an outer shroud. The outer shroud has first and second ends with outer surfaces. Connector rings are disposed around the outer surface of the base pipe and the first and second ends, respectively, of the outer shroud forming a mechanical interface therebetween. Each of the connector rings is operable to mechanically induce permanent deformation in the outer surface of the base pipe and the outer surface of the outer shroud, thereby connecting the screen jacket to the base pipe.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] For a more complete understanding of the features and advantages of the present invention, reference is now made to the detailed description of the invention along with the accompanying figures in which corresponding numerals in the different figures refer to corresponding parts and in which:

[0014] Figure 1 is a schematic illustration of a well system operating a plurality of sand control screen assemblies according to an embodiment of the present invention;

[0015] Figure 2 is a cross sectional view of a sand control screen assembly according to an embodiment of the present invention;

[0016] Figure 3 is an isometric view of one embodiment of a connector ring for use in a sand control screen assembly of the present invention;

[0017] Figure 4 is an isometric view of one embodiment of a connector ring for use in a sand control screen assembly of the present invention;

[0018] Figure 5 is an isometric view of one embodiment of a connector ring for use in a sand control screen assembly of the present invention;

[0019] Figure 6 is a cross sectional view of a sand control screen assembly according to an embodiment of the present invention;

[0020] Figure 7 is a cross sectional view of a sand control screen assembly according to an embodiment of the present invention;

[0021] Figure 8 is a cross sectional view of a sand control screen assembly according to an embodiment of the present invention;

[0022] Figure 9 is a cross sectional view of a sand control screen assembly according to an embodiment of the present invention;

[0023] Figure 10 is a cross sectional view of a sand control screen assembly according to an embodiment of the present invention; and

[0024] Figure 11 is a cross sectional view of a sand control screen assembly according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0025] While the making and using of various embodiments of the present invention are discussed in detail below, it should be appreciated that the present invention provides many applicable inventive concepts which can be embodied in a wide variety of specific contexts.

The specific embodiments discussed herein are merely illustrative of specific ways to make and use the invention, and do not delimit the scope of the present invention.

[0026] Referring initially to figure 1, therein is depicted a well system including a plurality of sand control screen assemblies embodying principles of the present invention that is schematically illustrated and generally designated 10. In the illustrated embodiment, a wellbore 12 extends through the various earth strata. Wellbore 12 has a substantially vertical section 14, the upper portion of which has cemented therein a casing string 16. Wellbore 12 also has a substantially horizontal section 18 that extends through a hydrocarbon bearing subterranean formation 20. As illustrated, substantially horizontal section 18 of wellbore 12 is open hole.

[0027] Positioned within wellbore 12 and extending from the surface is a tubing string 22. Tubing string 22 provides a conduit for formation fluids to travel from formation 20 to the surface. At its lower end, tubing string 22 is coupled to a completion string that has been installed in wellbore 12 and divides the completion interval into various production intervals adjacent to formation 20. The completion string includes a plurality of sand control screen assemblies 24, each of which is positioned between a pair of packers 26 that provides a fluid seal between the completion string and wellbore 12, thereby defining the production intervals. Sand control screen assemblies 24 serve the primary function of filtering particulate matter out of the production fluid stream.

[0028] Even though figure 1 depicts sand control screen assemblies of the present invention in an open hole environment, it should be understood by those skilled in the art that the sand control screen assemblies of the present invention are equally well suited for use in cased wells. Also, even though figure 1 depicts one sand control screen assembly in each production interval, it should be understood by those skilled in the art that any number of sand control screen assemblies of the present invention may be deployed within a production interval without departing from the principles of the present invention. In addition, even though figure 1 depicts multiple production intervals separated by packers, it should be understood by those skilled in the art that the completion interval may have any number of production intervals including a single interval with a corresponding number of packers or no packers. Further, even though figure 1 depicts the sand control screen assemblies of the present invention in a horizontal section of the wellbore, it should be understood by those skilled in the art that the sand control screen assemblies of the present invention are equally well suited for use in wells having other directional configurations including vertical wells,

deviated wellbores, slanted wells, multilateral well and the like. Accordingly, it should be understood by those skilled in the art that the use of directional terms such as above, below, upper, lower, upward, downward, left, right, uphole, downhole and the like are used in relation to the illustrative embodiments as they are depicted in the figures, the upward direction being toward the top of the corresponding figure and the downward direction being toward the bottom of the corresponding figure, the uphole direction being toward the surface of the well and the downhole direction being toward the toe of the well.

[0029] Referring next to figure 2, an embodiment of a sand control screen assembly of the present invention is depicted and generally designated 100. Sand control screen assembly 100 includes a base pipe 102 having a plurality of openings or perforations 104. Sand control screen assembly 100 has a screen jacket 106 that is attached to base pipe 102 according to the present invention. In the illustrated embodiment, screen jacket 106 includes plurality of circumferentially distributed axially extending ribs 108 with a screen wire 110 wrapped therearound that serves as the drainage layer for screen jacket 106. Screen jacket 106 also includes a filter medium 112, designed to allow fluids to flow therethrough but prevent particulate matter of a predetermined size from flowing therethrough. As illustrated, filter medium 112 consist of a fluid-porous, particulate restricting material in the form of a plurality of layers of a wire mesh that are diffusion bonded or sintered together to form a fluid porous wire mesh screen. In one embodiment, filter medium 112 has multiple layers of a plain Dutch weave or a twilled Dutch weave wire mesh material preferably having a uniform pore structure and a controlled pore size that is determined based upon formation properties. In other embodiments, filter medium 112 may be a single layer of wire mesh, multiple layers of wire mesh that are not bonded together, a single layer of wire wrap, multiple layers of wire wrap or the like, that may or may not operate with a drainage layer. Screen jacket 106 further includes an outer shroud 114 positioned around filter medium 112. As depicted, outer shroud 114 has a plurality of openings 116 and a plurality of dimples 118 that provide standoff between outer shroud 114 and filter medium 112.

[0030] Screen jacket 106 is mechanically coupled to base pipe 102 with a pair of connector rings 120, 122. In the illustrated embodiment, connector rings 120, 122 form mechanical interfaces between the outer surface of base pipe 102 and the inner surface of end portions 124, 126 of outer shroud 114. As best seen in figure 3, connector ring 120 is a cylindrical ring having a substantially rectangular cross sectional shape. Preferably, connector ring 120 is formed from a metal such as 13 chrome, 304L stainless steel, 316L

stainless steel, 420 stainless steel, 410 stainless steel, Incoloy 825 or similar alloy. In addition, connector ring 120 includes spikes 128 extending outwardly from its outer surface and spikes 130 extending outwardly from its inner surface. Preferably, spikes 128, 130 are formed from a hardened material including a surface hardened material and are operable to mechanically induced permanent deformation in base pipe 102 and outer shroud 114 such as through a crimping process which causes spikes 128 to create penetrations into outer shroud 114 and spikes 130 to create penetrations into base pipe 102. Similarly, connector ring 122 includes spikes 132 extending outwardly from its outer surface and spikes 134 extending outwardly from its inner surface that respectively, create penetrations into outer shroud 114 and base pipe 102 during a crimping or similar mechanical process. Once the mechanical connections are made between outer shroud 114 and base pipe 102 using connector rings 120, 122, longitudinal and rotational movement of screen jacket 106 relative to base pipe 102 is prevented. Alternatively, connector rings 120, 122 could be have spikes extending from only their inner surfaces to mechanically induced permanent deformation in base pipe 102 while being connected to outer shroud 114 using other techniques such as welding.

[0031] Referring next to figure 4, an alternate embodiment of a connector ring is depicted and generally designated 140. Connector ring 140 is a cylindrical ring having a substantially rectangular cross sectional shape. Preferably, connector ring 140 is formed from a metal or metal alloy. In addition, connector ring 140 includes a plurality of friction risers 142 extending outwardly from its outer surface and friction risers 144 extending outwardly from its inner surface. Friction risers 142, 144 may be in the form of an uneven surface such as a knurled surface formed by machining, etching or otherwise reshaping the surfaces of connector ring 140. Alternatively, friction risers 142, 144 may be in the form of a surface coating such as a particle coating including, for example, a tungsten carbide particle coating. Friction risers 142, 144 are operable to mechanically induced permanent deformation in the base pipe and the outer shroud such as through a crimping process which causes friction risers 142 to create penetrations into the outer shroud and friction risers 144 to create penetrations into the base pipe.

[0032] Referring next to figure 5, another alternate embodiment of a connector ring is depicted and generally designated 150. Connector ring 150 is a cylindrical ring having a substantially rectangular cross sectional shape. Preferably, connector ring 150 is formed from a polymer or rubber material or may be formed from a high strength adhesive material.

Connector ring 150 may be used to mechanically couple the outer shroud to the base pipe using a crimping process.

[0033] Referring next to figure 6, an embodiment of a sand control screen assembly of the present invention is depicted and generally designated 200. Sand control screen assembly 200 includes a base pipe 202 having a plurality of openings or perforations 204. Sand control screen assembly 200 has a screen jacket 206 that is attached to base pipe 202 according to the present invention. Screen jacket 206 includes plurality of circumferentially distributed axially extending ribs 208 with a screen wire 210 wrapped therearound, a filter medium 212 and an outer shroud 214 having a plurality of openings 216 and a plurality of dimples 218.

[0034] Screen jacket 206 is mechanically coupled to base pipe 202 with a pair of connector rings 220, 222. In the illustrated embodiment, connector rings 220, 222 form mechanical interfaces between the outer surface of base pipe 202 and the inner surface of end portions 224, 226 of outer shroud 214. Connector rings 220, 222 are in the form of cylindrical rings having substantially triangular cross sectional shapes and are preferably formed from a metal or metal alloy. In the illustrated embodiment, connector rings 220, 222 includes outwardly extending spikes that are preferably formed from a hardened material and are operable to mechanically induced permanent deformation in base pipe 202 and outer shroud 214 such as through a crimping process to create penetrations into base pipe 202 and outer shroud 214. Once the mechanical connections are made between outer shroud 214 and base pipe 202 using connector rings 220, 222, longitudinal and rotational movement of screen jacket 206 relative to base pipe 202 is prevented. Alternatively, connector rings 220, 222 could have other types of friction riser as described above with reference to figure 4. As another alternative, connector rings 220, 222 could have spikes or friction risers extending from only their inner surfaces to mechanically induce permanent deformation in base pipe 202 while being connected to outer shroud 214 using other techniques such as welding.

[0035] Referring next to figure 7, an embodiment of a sand control screen assembly of the present invention is depicted and generally designated 300. Sand control screen assembly 300 includes a base pipe 302 having a plurality of openings or perforations 304. Sand control screen assembly 300 has a screen jacket 306 that is attached to base pipe 302 according to the present invention. Screen jacket 306 includes plurality of circumferentially distributed axially extending ribs 308 with a screen wire 310 wrapped therearound, a filter medium 312 and an outer shroud 314 having a plurality of openings 316 and a plurality of dimples 318.

[0036] Screen jacket 306 is mechanically coupled to base pipe 302 with a pair of connector rings 320, 322. In the illustrated embodiment, connector rings 320, 322 form mechanical interfaces between the outer surface of base pipe 302 and the inner surface of end portions 324, 326 of outer shroud 314. Connector rings 320, 322 are in the form of cylindrical rings having substantially pyramidal cross sectional shapes and are preferably formed from a metal or metal alloy. In the illustrated embodiment, connector rings 320, 322 includes outwardly extending spikes that are preferably formed from a hardened material and are operable to mechanically induced permanent deformation in base pipe 302 and outer shroud 314 such as through a crimping process to create penetrations into base pipe 302 and outer shroud 314. Once the mechanical connections are made between outer shroud 314 and base pipe 302 using connector rings 320, 322, longitudinal and rotational movement of screen jacket 306 relative to base pipe 302 is prevented. Alternatively, connector rings 320, 322 could have other types of friction riser as described above with reference to figure 4. As another alternative, connector rings 320, 322 could have spikes or friction risers extending from only their inner surfaces to mechanically induce permanent deformation in base pipe 302 while being connected to outer shroud 314 using other techniques such as welding.

[0037] Referring next to figure 8, an embodiment of a sand control screen assembly of the present invention is depicted and generally designated 400. Sand control screen assembly 400 includes a base pipe 402 having a plurality of openings or perforations 404. Sand control screen assembly 400 has a screen jacket 406 that is attached to base pipe 402 according to the present invention. Screen jacket 406 includes plurality of circumferentially distributed axially extending ribs 408 with a screen wire 410 wrapped therearound, a filter medium 412 and an outer shroud 414 having a plurality of openings 416 and a plurality of dimples 418.

[0038] Screen jacket 406 is mechanically coupled to base pipe 402 with a pair of connector rings 420, 422. In the illustrated embodiment, connector rings 420, 422 form mechanical interfaces between the outer surface of base pipe 402 and the outer surface of end portions 424, 426 of outer shroud 414. Connector rings 420, 422 are preferably formed from a metal or metal alloy. In the illustrated embodiment, connector rings 420, 422 include outwardly extending spikes that are preferably formed from a hardened material and are operable to mechanically induced permanent deformation in base pipe 402 and outer shroud 414 such as through a crimping process to create penetrations into base pipe 402 and outer shroud 414. Once the mechanical connections are made between outer shroud 414 and base pipe 402 using connector rings 420, 422, longitudinal and rotational movement of screen

jacket 406 relative to base pipe 402 is prevented. Alternatively, connector rings 420, 422 could have other types of friction riser as described above with reference to figure 4.

[0039] Referring next to figure 9, an embodiment of a sand control screen assembly of the present invention is depicted and generally designated 500. Sand control screen assembly 500 includes a base pipe 502 having a plurality of openings or perforations 504. Sand control screen assembly 500 has a screen jacket 506 that is attached to base pipe 502 according to the present invention. Screen jacket 506 includes plurality of circumferentially distributed axially extending ribs 508 with a screen wire 510 wrapped therearound, a filter medium 512 and an outer shroud 514 having a plurality of openings 516 and a plurality of dimples 518.

[0040] Screen jacket 506 is mechanically coupled to base pipe 502 with a pair of connector rings 520, 522. In the illustrated embodiment, connector rings 520, 522 form mechanical interfaces between the outer surface of base pipe 502 and the outer surface of end portions 524, 526 of outer shroud 514. Connector rings 520, 522 are preferably formed from a metal or metal alloy. In the illustrated embodiment, connector rings 520, 522 include outwardly extending spikes depicted as removable inserts 528 that are preferably formed from a hardened material and are operable to mechanically induced permanent deformation in base pipe 502 and outer shroud 514 such as through a crimping process to create penetrations into base pipe 502 and outer shroud 514. Once the mechanical connections are made between outer shroud 514 and base pipe 502 using connector rings 520, 522, longitudinal and rotational movement of screen jacket 506 relative to base pipe 502 is prevented.

[0041] Referring next to figure 10, an embodiment of a sand control screen assembly of the present invention is depicted and generally designated 600. Sand control screen assembly 600 includes a base pipe 602 having a plurality of openings or perforations 604. Sand control screen assembly 600 has a screen jacket 606 that is attached to base pipe 602 according to the present invention. Screen jacket 606 includes plurality of circumferentially distributed axially extending ribs 608 with a screen wire 610 wrapped therearound, a filter medium 612 and an outer shroud 614 having a plurality of openings 616 and a plurality of dimples 618.

[0042] Screen jacket 606 is mechanically coupled to base pipe 602 with a pair of connector rings 620, 622. In the illustrated embodiment, connector rings 620, 622 form mechanical interfaces between the outer surface of base pipe 602 and outer shroud 614. Connector rings 620, 622 are preferably formed from a metal or metal alloy. In the illustrated embodiment, connector rings 620, 622 are welded at 624, 626 to outer shroud 614 and include outwardly extending spikes that are preferably formed from a hardened material and

are operable to mechanically induced permanent deformation in base pipe 602 such as through a crimping process to create penetrations into base pipe 602. Once the mechanical connections are made between outer shroud 614 and base pipe 602 using connector rings 620, 622, longitudinal and rotational movement of screen jacket 606 relative to base pipe 602 is prevented.

[0043] Referring next to figure 11, an embodiment of a sand control screen assembly of the present invention is depicted and generally designated 700. Sand control screen assembly 700 includes a base pipe 702 having a plurality of openings or perforations 704. Sand control screen assembly 700 has a screen jacket 706 that is attached to base pipe 702 according to the present invention. Screen jacket 706 includes plurality of circumferentially distributed axially extending ribs 708 with a screen wire 710 wrapped therearound, a filter medium 712 and an outer shroud 714 having a plurality of openings 716 and a plurality of dimples 718.

[0044] Screen jacket 706 is mechanically coupled to base pipe 702 with a pair of connector rings 720, 722 that are integrally formed on the ends of outer shroud 714 or are otherwise coupled thereto mechanically or by welds. In the illustrated embodiment, connector rings 720, 722 form mechanical interfaces between outer shroud 714 and base pipe 702. In the illustrated embodiment, connector rings 720, 722 include outwardly extending spikes that are preferably formed from a hardened material and are operable to mechanically induced permanent deformation in base pipe 702 such as through a crimping process to create penetrations into base pipe 702. Once the mechanical connections are made between outer shroud 714 and base pipe 702 using connector rings 720, 722, longitudinal and rotational movement of screen jacket 706 relative to base pipe 702 is prevented.

[0045] While this invention has been described with reference to illustrative embodiments, this description is not intended to be construed in a limiting sense. Various modifications and combinations of the illustrative embodiments as well as other embodiments of the invention will be apparent to persons skilled in the art upon reference to the description. It is, therefore, intended that the appended claims encompass any such modifications or embodiments.

What is claimed is:

1. A sand control screen assembly for use in a subterranean well, the sand control screen assembly comprising:

a base pipe having an outer surface and at least one opening in a side wall portion thereof;

a screen jacket disposed around the base pipe, the screen jacket having a filter medium and an outer shroud, the outer shroud having first and second ends with inner and outer surfaces; and

connector rings forming a mechanical interface between the base pipe and the first and second ends, respectively, of the outer shroud, each of the connector rings operable to mechanically induce permanent deformation in the outer surface of the base pipe and at least one of the inner surface and the outer surface of the outer shroud, thereby connecting the screen jacket to the base pipe.

2. The sand control screen assembly as recited in claim 1 wherein the connector rings prevent longitudinal movement of the screen jacket relative to the base pipe.

3. The sand control screen assembly as recited in claim 1 wherein the connector rings prevent rotational movement of the screen jacket relative to the base pipe.

4. The sand control screen assembly as recited in claim 1 wherein each connector ring is disposed between the outer surface of the base pipe and one of the inner surfaces of the outer shroud.

5. The sand control screen assembly as recited in claim 1 wherein each connector ring is disposed around the outer surface of the base pipe and one of the outer surfaces of the outer shroud.

6. The sand control screen assembly as recited in claim 1 wherein the mechanically induced permanent deformation further comprises crimping the connector rings to create penetrations into the base pipe and the outer shroud.

7. The sand control screen assembly as recited in claim 1 wherein the connector rings further comprise cylindrical rings.

8. The sand control screen assembly as recited in claim 1 wherein the connector rings further comprise a plurality of spikes extending outwardly from at least one of an inner surface and an outer surface of the connector rings.

9. The sand control screen assembly as recited in claim 8 wherein the spikes further comprise removable inserts.

10. The sand control screen assembly as recited in claim 1 wherein the connector rings further comprise a plurality of friction riser extending outwardly from at least one of an inner surface and an outer surface of the connector rings.

11. The sand control screen assembly as recited in claim 1 wherein the connector rings have a cross sectional shape selected from the group consisting of a substantially rectangular shape, a substantially triangular shape and a substantially pyramidal shape.

12. A sand control screen assembly for use in a subterranean well, the sand control screen assembly comprising:

a base pipe having an outer surface and at least one opening in a side wall portion thereof;

a screen jacket disposed around the base pipe, the screen jacket having a filter medium and an outer shroud, the outer shroud having first and second ends with inner surfaces; and

connector rings disposed between the base pipe and the first and second ends, respectively, of the outer shroud, each of the connector rings operably coupled to the outer shroud and operable to mechanically induce permanent deformation in the outer surface of the base pipe, thereby connecting the screen jacket to the base pipe.

13. The sand control screen assembly as recited in claim 12 wherein the mechanically induced permanent deformation further comprises crimping the connector rings to create penetrations into the base pipe.

14. The sand control screen assembly as recited in claim 12 wherein the connector rings further comprise a plurality of spikes extending outwardly from an inner surface of the connector rings.

15. The sand control screen assembly as recited in claim 12 wherein the connector rings further comprise a plurality of friction riser extending outwardly from an inner surface of the connector rings.

16. The sand control screen assembly as recited in claim 12 wherein the connector rings have a cross sectional shape selected from the group consisting of a substantially rectangular shape, a substantially triangular shape and a substantially pyramidal shape.

17. A sand control screen assembly for use in a subterranean well, the sand control screen assembly comprising:

a base pipe having an outer surface and at least one opening in a side wall portion thereof;

a screen jacket disposed around the base pipe, the screen jacket having a filter medium and an outer shroud, the outer shroud having first and second ends with outer surfaces; and

connector rings disposed around the outer surface of the base pipe and the first and second ends, respectively, of the outer shroud forming a mechanical interface therebetween, each of the connector rings operable to mechanically induce permanent deformation in the outer surface of the base pipe and the outer surface of the outer shroud, thereby connecting the screen jacket to the base pipe.

18. The sand control screen assembly as recited in claim 17 wherein the mechanically induced permanent deformation further comprises crimping the connector rings to create penetrations into the base pipe and the outer shroud.

19. The sand control screen assembly as recited in claim 17 wherein the connector rings further comprise a plurality of spikes extending outwardly from an inner surface of the connector rings.

20. The sand control screen assembly as recited in claim 17 wherein the connector rings further comprise a plurality of friction riser extending outwardly from an outer surface of the connector rings.