What is claimed is:

1. A method, comprising:

deploying a well tool downhole on a tubing string with the well tool in an open condition wherein a flow path of the tool is in fluid communication with the tubing string, the well tool including a central bore along the flow path in line with the tubing string, and with a swellable metallic material arranged along the flow path including on an inner diameter of the central bore;

performing a service operation including flowing a well fluid down the tubing string and through the central bore of the well tool and out a lower end of the central bore; and

after performing the service operation, delivering an activation fluid downhole to the well tool to activate the swellable metallic material wherein the swellable metallic material expands to close the central bore of the well tool.

2. The method of claim 1, wherein activating the swellable metallic material comprises undergoing metal hydration reactions in the presence of a brine to form metal hydroxides.

3. The method of claim 1, further comprising:

controlling flow of a formation fluid through the well tool using one or both of a float valve and a float shoe along the central bore of the tool prior to activating the swellable metallic material.

4. The method of claim 1, further comprising:

flowing the well fluid down the tubing string and out through one or more side ports of a ported sub during the service operation; and

wherein the swellable metallic material is arranged in the one or more side ports and expands to close the side ports upon activation.

5. The method of claim 1, further comprising:

flowing the well fluid down the tubing string and out through one or more ports of a ported bullnose or shoe during the service operation; and



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wherein the swellable metallic material is arranged to close the one or more ports of the ported bullnose or shoe upon activation.

6. The method of claim 1, wherein the service operation comprises a stimulation treatment, a perforating operation, or a cementing operation.

7. A well system, comprising:

a well tool deployable on a tubing string in an open condition with a flow path of the well tool in fluid communication with the tubing string, the well tool including a central bore along the flow path and in line with the tubing string;

a swellable metallic material arranged along the flow path, wherein the flow path is initially open to flow a well fluid over the swellable metallic material, wherein at least some of the swellable metallic material is arranged on an inner diameter of the central bore; and

an activation fluid source for delivering an activation fluid downhole to the well tool to activate the swellable metallic material, wherein the swellable metallic material expands to close the central bore of the tool upon activation.

8. The well system of claim 7, wherein the swellable metallic material is configured to swell by undergoing metal hydration reactions in the presence of brines to form metal hydroxides.

9. The well system of claim 7, further comprising one or more valves along the central bore and configured for controlling flow of a formation fluid up through the well tool prior to activating the swellable metallic material, wherein the one or more valves comprise at least a float valve, wherein the swellable metallic material is above the float valve or between the float valve and a float shoe spaced from the float valve along the central bore.

10. The well system of claim 7, wherein the swellable metallic material is arranged in the central bore to close the central bore upon activation by the activation fluid without any valve in the tool body.



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11. The well system of claim 7, further comprising:

a ported sub having one or more side ports along the flow path; and

wherein the swellable metallic material is arranged in the one or more side ports to close the side ports upon activation.

12. The well system of claim 7, further comprising:

a ported bullnose or shoe having one or more ports along the flow path at a lower end of the well tool; and

wherein the swellable metallic material is arranged to close the one or more ports of the ported bullnose or shoe upon activation.

13. The well system of claim 7, further comprising:

a casing disposed in a wellbore;

wherein the well tool is sealingly engaged with the casing with the flow path open to a formation below the well tool for delivering a well fluid to the formation to stimulate production of a formation fluid prior to activating the swellable metallic material; and

wherein activation of the flow path closes flow of the formation fluid up through the well tool.

14. The well system of claim 13, wherein the well tool comprises a bridge plug or squeeze packer, and wherein the well tool is sealingly engaged with the casing by the bridge plug or packer.

15. The well system of claim 13, wherein the swellable metallic material is configured to swell by undergoing metal hydration reactions in the presence of a brine to form metal hydroxides.

16. The well system of claim 7, wherein the swellable metallic material is configured to hold at least 50 pounds per square inch (0.347 MPA) after activation to close the flow path.



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17. A well system, comprising:

a well tool deployable on a tubing string in an open condition with a flow path of the well tool in fluid communication with the tubing string;

a swellable metallic material arranged along the flow path, wherein the flow path is initially open to flow a well fluid over the swellable metallic material;

an activation fluid source for delivering an activation fluid downhole to the well tool to activate the swellable metallic material, wherein the swellable metallic material is arranged to close the flow path of the tool upon activation;

wherein the well tool comprises a central bore in line with the tubing string, and wherein the swellable metallic material is arranged on an inner diameter of the central bore to close the central bore upon activation;

one or more valves along the central bore and configured for controlling flow of a formation fluid up through the well tool prior to activating the swellable metallic material; and

wherein the one or more valves comprise a float valve and float shoe along the central bore with the swellable metallic material between the float valve and float shoe or wherein the one or more valves comprise a float valve, with the swellable metallic material is above the float valve.

18. The well system of claim 17, wherein the swellable metallic material is configured to swell by undergoing metal hydration reactions in the presence of brines to form metal hydroxides.

19. The well system of claim 17, further comprising a tool body defining a central bore, wherein the swellable metallic material is arranged in the central bore to close the central bore upon activation by the activation fluid, without any valve in the tool body.

20. The well system of claim 17, further comprising:

a ported sub having one or more side ports along the flow path; and

wherein the swellable metallic material is arranged in the one or more side ports to close the side ports upon activation.



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