WHAT IS CLAIMED IS:

1. A sealing tool, comprising:

a mandrel; and

a sealing assembly positioned about the mandrel, the sealing assembly including:

one or more elastomeric sealing elements having a pre-expansion width (W_{SE}), the one or more elastomeric sealing elements operable to move between a radially relaxed state and a radially expanded state; and

a pair of non-elastomeric conductive expandable metal features straddling the one or more elastomeric sealing elements, each of the pair of expandable metal features comprising a metal configured to expand in response to hydrolysis and having a pre-expansion width (W_{EM}), and further wherein the pre-expansion width (W_{SE}) is at least three times the pre-expansion width (W_{EM}), wherein a volume of the pair of non-elastomeric expandable metal features is bound, such that during expansion, the expandable metal is configured to go from metal to micron-scale particles that are larger and lock together .

2. The sealing tool as recited in Claim 1, wherein the pair of expandable metal features are a pair of expandable metal backup shoes.

3. The sealing tool as recited in Claim 1, further including a pair of metal backup shoes straddling the one or more elastomeric sealing elements.

4. The sealing tool as recited in Claim 3, wherein the pair of expandable metal features are positioned axially between the pair of metal backup shoes and the one or more elastomeric sealing elements.

5. The sealing tool as recited in Claim 3, wherein the pair of metal backup shoes are positioned axially between the pair of expandable metal features and the one or more elastomeric sealing elements.

6. The sealing tool as recited in Claim 1, further including a pair of end rings straddling the pair of expandable metal features, the pair of end rings configured to axially slide

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relative to one another to move the elastomeric sealing elements between the radially relaxed state and the radially expanded state.

7. The sealing tool as recited in Claim 1, wherein the pair of expandable metal features are a pair of end rings straddling the one or more elastomeric sealing elements, the pair of end rings axially fixed relative to one another.

8. The sealing tool as recited in Claim 7, wherein the one or more elastomeric sealing elements are one or more swellable elastomeric sealing elements configured to swell to move between the radially relaxed state and the radially expanded state.

9. The sealing tool as recited in Claim 1, further including a delay coating enclosing each of the pair of expandable metal features.

10. The sealing tool as recited in Claim 1, wherein each of the pair of expandable metal features are a wire of expandable metal wrapped multiple times around the mandrel.

11. A method for sealing an annulus within a wellbore, comprising:

providing a sealing tool within a wellbore, the sealing tool including:

a mandrel; and

a sealing assembly positioned about the mandrel, the sealing assembly including:

one or more elastomeric sealing elements having a pre-expansion width (W_{SE}), the one or more elastomeric sealing elements operable to move between a radially relaxed state and a radially expanded state; and

a pair of non-elastomeric conductive expandable metal features straddling the one or more elastomeric sealing elements, each of the pair of expandable metal features comprising a metal configured to expand in response to hydrolysis and having a pre-expansion width (W_{EM}), and further wherein the pre-expansion width (W_{SE}) is at least three times the pre-expansion width (W_{EM}), wherein a volume of the pair of non-elastomeric expandable metal features is bound, such that during expansion, the expandable metal is configured to go from metal to micron-scale particles that are larger and lock together;

setting the one or more elastomeric sealing elements by moving the one or more elastomeric elements from the radially relaxed state to the radially expanded state; and

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subjecting the pair of expandable metal features to reactive fluid to form a pair of expanded metal features.

12. The method as recited in Claim 11, wherein the setting occurs prior to the subjecting.

13. The method as recited in Claim 12, wherein the setting includes radially moving the pair of expandable metal features relative to one another, the radially moving mechanically deforming the pair of expandable metal features, and further wherein subjecting the pair of expandable metal features to the reactive fluid includes subjecting the deformed pair of expandable metal features to the reactive fluid to form the pair of expanded metal features.

14. The method as recited in Claim 11, further including a pair of end rings straddling the pair of expandable metal features, wherein the pair of expandable metal features are a pair of expandable metal backup shoes, and further wherein setting the one or more elastomeric elements includes axially sliding the pair of end rings relative to each other to move the one or more elastomeric elements from the radially relaxed state to the radially expanded state.

15. The method as recited in Claim 11, further including a pair of metal backup shoes straddling the one or more elastomeric elements, the pair of expandable metal features positioned axially between the pair of metal backup shoes and the one or more elastomeric sealing elements, and further including a pair of end rings straddling the pair of metal backup shoes, and wherein setting the one or more elastomeric elements includes axially sliding the pair of end rings relative to each other to move the one or more elastomeric elements from the radially relaxed state to the radially expanded state.

16. The method as recited in Claim 11, further including a pair of metal backup shoes straddling the one or more elastomeric elements, the pair of metal backup shoes positioned axially between the pair of expandable metal features and the one or more elastomeric sealing elements, and further including a pair of end rings straddling the pair of expandable metal features, and wherein setting the one or more elastomeric elements includes axially sliding the pair of end rings relative to each other to move the one or more elastomeric elements from the radially relaxed state to the radially expanded state.

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17. The method as recited in Claim 11, wherein the pair of expandable metal features are a pair of end rings straddling the one or more elastomeric sealing elements, the pair of end rings axially fixed relative to one another, and wherein setting the one or more elastomeric elements includes subjecting the one or more elastomeric elements to an activation fluid causing the one or more elastomeric elements to swell and move between the radially relaxed state and the radially expanded state.

18. The method as recited in Claim 11, further including a delay coating enclosing each of the pair of expandable metal features, and further wherein setting the one or more elastomeric elements breaks the delay coating thereby allowing the reactive fluid to form the pair of expanded metal features.

19. The method as recited in Claim 11, wherein each of the pair of expandable metal features are a wire of expandable metal wrapped multiple times around the mandrel.

20. A well system, comprising:

a wellbore extending through one or more subterranean formations; and

a sealing assembly positioned about the wellbore, the sealing assembly including:

a mandrel; and

a sealing assembly positioned about the mandrel, the sealing assembly including:

one or more elastomeric sealing elements having a pre-expansion width (W_{SE}), the one or more elastomeric sealing elements in a radially expanded state; and

a pair of volumetrically bound expanded metal features straddling the one or more elastomeric sealing elements, each of the pair of expanded metal features comprising a metal that has expanded in response to hydrolysis, and thus comprising micron-scale particles that lock together.

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