What is claimed is:

1. A thread forming screw configured to cold form threads in a workpiece having a surface hardness which exceeds HRC 23, said thread forming screw characterized by a head and a threaded shank extending from the head, wherein at least some of the threads of the shank have a surface hardness of at least HRC 56, thereby enabling the thread forming screw to be used to cold form threads in the workpiece having a surface hardness which exceeds HRC 23.

2. A thread forming screw as recited in claim 1, characterized in that the threaded shank comprises lead threads proximate an end of the screw, opposite the head.

3. A thread forming screw as recited in claim 2, characterized in that the lead threads taper to the end of the screw.

4. A thread forming screw as recited in claim 2, further characterized by a plurality of full threads on the threaded shank, disposed between the lead threads and the head of the screw.

5. A thread forming screw as recited in claim 4, characterized in that the lead threads and at least three of the full threads of the screw have a surface hardness of at least HRC 56, to a depth of at least 0.008 inches.

6. A thread forming screw as recited in claim 5, characterized in that a core of the screw has a hardness in the range of Rockwell C33 to 39.

7. A thread forming screw as recited in claim 6, characterized in that a first portion of the screw, proximate the end of the screw, has a minimum induction hardened area at HRC 56 min., and a second portion of the screw has a maximum induction hardened area at HRC 56 min.

8. A thread forming screw as recited in claim 7, characterized in that a third portion of the screw has a surface hardness within 3 points HRC of the core.

9. A method for forming a thread forming screw which is configured to cold form threads in a workpiece having a surface hardness which exceeds HRC 23, said method characterized by providing a wire made of steel; drawing the wire at a cold heading machine; forming threads on the wire to form a screw; performing a heat treating process on the screw, by carbon enriching the screw, and induction hardening lead

threads and at least three full threads of the screw, such that the thread forming screw has a head and a threaded shank extending from the head, and at least some of the threads of the shank have a surface hardness of at least HRC 56.

10. A method of forming a thread forming screw as recited in claim 9, further characterized by quenching and tempering the screw after carbon enriching the screw and before induction hardening the lead threads and at least three full threads of the screw.

11. A method of forming a thread forming screw as recited in claim 9, further characterized by quenching and tempering the screw after induction hardening the lead threads and at least three full threads of the screw.

12. A method of forming a thread forming screw as recited in claim 9, characterized in that the step of carbon enriching the screw comprises leaving the screw in a furnace for 90 minutes while the furnace is at 1600-1700 degrees Fahrenheit while controlling the furnace atmosphere to 0.6 to 0.7% carbon potential, wherein a depth of a carbon restored zone of the screw is at least 0.008 inches.

13. A method of forming a thread forming screw as recited in claim 9, further characterized by quenching and tempering the screw after carbon enriching the screw and before induction hardening the lead threads and at least three full threads of the screw, wherein the step of quenching the screw comprises quenching the screw in oil at 140-160 degrees Fahrenheit.

14. A method of forming a thread forming screw as recited in claim 9, further characterized by quenching and tempering the screw after carbon enriching the screw and before induction hardening lead threads and at least three full threads of the screw, wherein the step of tempering the screw comprises tempering the screw for 90 minutes at a temperature of 850-950 degrees Fahrenheit, wherein the surface hardness of the screw does not exceed the core hardness by more than 3 Rockwell C points, wherein both the surface and the core of the screw are at a Rockwell C33 to 39 hardness.

15. A method of forming a thread forming screw as recited in claim 9, characterized in that the step of induction hardening the lead threads and at least four full threads of the screw comprises momentarily feeding the screw into the influence of an electric field in such a way as to induction

heat the threads to a hardening temperature of 1650-1750 degrees Fahrenheit.

16. A method of forming a thread forming screw as recited in claim 9, further characterized by quenching and tempering the screw after induction hardening the lead threads and at least three full threads of the screw, wherein the step of tempering comprises tempering the screw at 300 degrees Fahrenheit for a minimum of one hour, thereby lowering a brittleness of the screw, wherein the tempering step and the carbon enrichment step provide that the lead threads and at least the first three full threads are at a Rockwell C56 minimum hardness, to a depth of at least 0.008 inches, and the core of the fastener is at Rockwell C33 to 39 hardness.

17. A method of forming a thread forming screw as recited in claim 9, further characterized by quenching and tempering the screw after induction hardening the lead threads and at least three full threads of the screw, wherein the tempering step and the carbon enrichment step provide that the lead threads and at least the first three full threads are at a Rockwell C56 minimum hardness, to a depth of at least 0.008 inches, and the core of the fastener is at Rockwell C33 to 39 hardness.

18. A method of forming a thread forming screw as recited in claim 9, further characterized by providing that the wire comprises an alloy steel, AISI C4037 grade analysis with a composition of: carbon 0.35-0.40 percent; manganese 0.70-0.90 percent, sulphur 0.040 percent max., phosphorous 0.035 percent max., silicon 0.20-0.35 percent and molybdenum 0.20-0.30 percent.

What is claimed is:

1. A method for forming a thread forming screw which is configured to cold form threads in a workpiece having a surface hardness which exceeds HRC 23, said method comprising:

providing a wire made of steel;

drawing the wire at a cold heading machine to form a head and a shank extending from the head to a free end;

forming threads on the shank to form a screw, wherein the formed threads comprise full threads proximate to the head and lead threads between the full threads and the free end;

performing a heat treating process on the screw, by first carbon enriching the screw to provide that a surface hardness of the screw is at a Rockwell C33 to 39 hardness and to provide that the surface hardness of the screw does not exceed a core hardness of the screw by more than 3 Rockwell C points, and by second induction hardening the lead threads and at least three of the full threads of the screw that are provided closest to the lead threads, such that the induction hardened threads have a surface hardness of at least HRC 56.

2. A method of forming a thread forming screw as recited in claim 1, further comprising quenching and tempering the screw after carbon enriching the screw and before induction hardening the lead threads and the at least three full threads of the screw that are provided closest to the lead threads.

3. A method of forming a thread forming screw as recited in claim 1, further comprising quenching and tempering the screw after induction hardening the lead threads and the at least three full threads of the screw that are provided closest to the lead threads.

4. A method of forming a thread forming screw as recited in claim 1, wherein the step of carbon enriching the screw comprises leaving the screw in a furnace for 90 minutes while the furnace is at 1600-1700 degrees Fahrenheit while controlling the furnace atmosphere to 0.6 to 0.7% carbon potential, wherein a depth of a carbon restored zone of the screw is at least 0.008 inches.

5. A method of forming a thread forming screw as recited in claim 1, further comprising quenching and tempering the screw after carbon enriching the screw and before induction hardening the lead threads and the at least three full threads of the screw that are provided closest to the lead threads, wherein the step of quenching the screw comprises quenching the screw in oil at 140-160 degrees Fahrenheit.

6. A method of forming a thread forming screw as recited in claim 1, further comprising quenching and tempering the screw after carbon enriching the screw and before induction hardening the lead threads and the at least three full threads of the screw that are provided closest to the lead threads, wherein the step of tempering the screw comprises tempering the screw for 90 minutes at a temperature of 850-950 degrees Fahrenheit.

7. A method of forming a thread forming screw as recited in claim 1, wherein the step of induction hardening the lead threads and the at least three full threads of the screw that are provided closest to the lead threads comprises momentarily feeding the screw into the influence of an electric field in such a way as to induction heat the lead threads and the at least three full threads of the screw that are provided closest to the lead threads to a hardening temperature of 1650-1750 degrees Fahrenheit.

8. A method of forming a thread forming screw as recited in claim 1, further comprising quenching and tempering the screw after induction hardening the lead threads and the at least three full threads of the screw that are provided closest to the lead threads, wherein the step of tempering comprises tempering the screw at 300 degrees Fahrenheit for a minimum of one hour, thereby lowering a brittleness of the screw, wherein the tempering step and the carbon enrichment step provide that the induction hardened threads are at a Rockwell C56 minimum hardness, to a depth of at least 0.008 inches.

9. A method of forming a thread forming screw as recited in claim 1, further comprising quenching and tempering the screw after induction hardening the lead threads and the at least three full threads of the screw that are provided closest to the lead threads, wherein the tempering step and the carbon enrichment step provide that the induction hardened threads are at a Rockwell C56 minimum hardness, to a depth of at least 0.008 inches.

10. A method of forming a thread forming screw as recited in claim 1, further comprising providing that the wire comprises an alloy steel, AISI C4037 grade analysis with a composition of: carbon 0.35-0.40 percent; manganese 0.70-0.90 percent; sulphur 0.040 percent max.; phosphorus 0.035 percent max.; silicon 0.20-0.35 percent; and molybdenum 0.20-0.30 percent.

11. A method of forming a thread forming screw as recited in claim 1, wherein the step of carbon enriching the screw comprises carbon enriching the screw such that the screw obtains at least a 0.48 carbon level.