CLAIMS

1. A rotary kiln for sintering of green granules to produce lightweight aggregates, comprising:

an inner surface defining a sintering chamber; and

a plurality of screening elements disposed along the sintering chamber;

wherein each screening element is configured to define a plurality of gaps at or near respective portions of an outer edge of each screening element adjacent the inner surface of the rotary kiln, with the gaps increasing from one edge portion to another in a direction along the outer edge of each screening element that is opposite to the rotational direction of the rotary kiln; and

wherein the plurality of screening elements are configured in an offset manner such that none of the gaps of the same size overlap between directly adjacent pairs of the plurality of screening elements.

2. The rotary kiln of claim 1, comprising sets of the plurality of screening elements disposed along the sintering chamber.

3. The rotary kiln of claim 2, wherein a sequence of the plurality of screening elements and their respective orientations are the same between the sets.

4. The rotary kilns of any one of claims 1 to 3, comprising first and second end plates disposed at a material input end and a material output end of the kiln, respectively, each of the first and second plates comprising an opening for input and output of the material, respectively.

5. The rotary kiln of claim 4, wherein the first and second end plates are configured for securing a plurality of mounting rods for the screening elements.

6. The rotary kiln of claim 5, wherein each screening element is configured for engaging the mounting rods to mount the screening elements along the sintering chamber.

7. The rotary kiln of any one of claims 1 to 6, wherein each of the plurality of screening elements comprises a central opening.

8. The rotary kiln of claim 7, wherein each of the plurality of screening elements is substantially ring shaped.

9. The rotary kiln of any one of claims 1 to 8, wherein each screening element comprises a cut-out portion allowing granules larger than a largest one of the gaps to pass through.

10. A screening assembly for a rotary kiln for sintering of green granules to produce lightweight aggregates, comprising a plurality of screening elements configured for being disposed along a sintering chamber defined by an inner surface of the rotary kiln;

wherein each screening element is configured to define a plurality of gaps at or near respective portions of an outer edge of each screening element adjacent the inner surface of the rotary kiln, with the gaps increasing from one edge portion to another in a direction that is opposite to the rotational direction of the rotary kiln; and

wherein the plurality of screening elements are configured to be arranged in an offset manner in the sintering chamber such that none of the gaps of the same size overlap between directly adjacent pairs of the plurality of screening elements.

11. The screening assembly of claim 10, comprising sets of the plurality of screening elements configured for being disposed along the sintering chamber.

12. The screening assembly of claim 11, wherein the sets are configured such that a sequence of the plurality of screening elements and their respective orientations are the same between the sets.

13. The screening assembly of any one of claims 10 to 12, comprising first and second end plates configured for being disposed at a material input end and a material output end of the kiln, respectively, each of the first and second plates comprising an opening for input and output of the material, respectively.

14. The screening assembly of claim 13, wherein the first and second end plates are configured for securing a plurality of mounting rods for the screening elements.

15. The screening assembly of claim 14, wherein each screening element is configured for engaging the mounting rods to mount the screening elements along the sintering chamber.

16. The screening assembly of any one of claims 10 to 15, wherein each of the plurality of screening elements comprises a central opening.

17. The screening assembly of claim 16, wherein each of the plurality of screening elements is substantially ring shaped.

18. The screening assembly of any one of claims 10 to 17, wherein each screening element comprises a cut-out portion allowing granules larger than a largest one of the gaps to pass through.

19. A method of sintering of green granules to produce lightweight aggregates, comprising screening the granules during the sintering process using the rotary kiln of any one of claims 1 to 9 or the screening assembly of any one of claims 10 to 18.