CLAIMS

1. A process for handling MEMS wafers comprising the steps of:

(i) attaching a first carrier substrate to a first side of a MEMS wafer having a plurality of inkjet nozzles, the first carrier substrate being attached via a silicone-free peel tape and a first wafer bonding tape, the peel tape contacting the first side of the MEMS wafer;

(ii) performing one or more wafer processing steps on an opposite second side of the MEMS wafer;

(iii) releasing the first carrier substrate from the first side of the MEMS wafer via exposure to an energy source, the energy source selectively releasing the first wafer bonding tape from the peel tape; and

(iv) peeling the peel tape away from the first side of the MEMS wafer.

2. The process of claim 1, wherein the MEMS wafer comprises MEMS inkjet devices.

~~3. The process of claim 1, wherein the first side of the MEMS wafer has a plurality of inkjet nozzles.~~

~~4~~3. The process of claim 1, wherein the first carrier substrate is comprised of glass.

~~5~~4. The process of claim 1, wherein the first wafer bonding tape comprises silicon.

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5. The process of claim 1, wherein the first wafer bonding tape is a UV-release tape and the energy source is UV light.

~~7~~6. The process of claim 1, wherein the first wafer bonding tape is a thermal-release tape and the energy source is heat.

~~8~~7. The process of claim 1, wherein the wafer processing steps are selected from the group consisting of: wafer grinding, etching and oxidative ashing.

~~9~~8. The process of claim 1, further comprising the step of attaching a second carrier substrate to the second side of the wafer prior to step (iii).

~~10~~9. The process of claim ~~9~~8, wherein the second carrier substrate is attached via a second wafer bonding tape different than the first wafer bonding tape.

~~11~~10. The process of claim ~~10~~9, wherein the first and second wafer bonding tapes are selected from the group consisting of: UV-release tape and thermal-release tape.

~~12~~11. The process of claim 1, further comprising the step of oxidatively ashing the first side of the MEMS wafer after step (iv).

~~13~~12. The process of claim 1, wherein the step (iv) of peeling the peel tape simultaneously removes the first wafer bonding tape attached to the peel tape.

~~14~~13. A wafer assembly for use in a MEMS fabrication process, the wafer assembly comprising:

a MEMS wafer having a first side having a plurality of inkjet nozzles and an opposite second side;

a silicon~~e~~-free peel tape releasably attached to the first side of the wafer;

a first wafer bonding tape attached to the peel tape; and

a first carrier substrate releasably attached to the first wafer bonding tape.

~~15~~14. The wafer assembly of claim ~~14~~13, wherein the first wafer bonding tape contains silicon.

~~16~~15. The wafer assembly of claim ~~14~~13, wherein the MEMS wafer comprises MEMS inkjet devices.

~~17. The wafer assembly of claim 14 wherein the first side of the MEMS wafer has a plurality of inkjet nozzles.~~

~~18~~16. The wafer assembly of claim ~~14~~13, further comprising:

a second wafer bonding tape attached to the second side of the wafer; and

a second carrier substrate releasably attached to the second wafer bonding tape.

~~19~~17. The wafer assembly of claim ~~18~~16, wherein the second wafer bonding tape is different than the first wafer bonding tape.

~~20~~18. The wafer assembly of claim ~~18~~16, wherein the first and second wafer bonding tapes are selected from the group consisting of: UV-release tape and thermal-release tape.