CLAIMS

1. A method, comprising:

conforming a sheet substrate which is a planar sheet and which is pliable to an external surface of a vacuum apparatus whose temperature is to be determined, said vacuum apparatus having heater elements, said sheet substrate having a width which is greater than a distance between said heater elements and a length which provides for a plurality of turns around said vacuum apparatus; and

thermally coupling a temperature sensor with said sheet substrate to provide a thermal path from said vacuum apparatus to said temperature sensor by interposing said sheet substrate between said temperature sensor and said vacuum apparatus.

2~~1~~. A vacuum apparatus temperature sensor assembly, comprising:

a vacuum apparatus whose temperature is to be determined, said vacuum apparatus having heater elements;

a sheet substrate ~~configured~~which is a planar sheet and which is pliable to conform to ~~a shape~~an external surface of ~~a~~said vacuum apparatus ~~whose temperature is to be determined~~, wherein said sheet substrate has a width which is greater than a distance between said heater elements and wherein said sheet substrate has a length which provides for a plurality of turns around said vacuum apparatus; and

a temperature sensor thermally coupled with said sheet substrate, wherein the sheet substrate is configured to provide a thermal path from said vacuum apparatus to said temperature sensor and wherein said sheet substrate is interposed between said temperature sensor and said vacuum apparatus.

~~2. The vacuum apparatus temperature sensor assembly of claim 1, wherein said sheet substrate is configured to conform to an external surface of said vacuum apparatus.~~

~~3. The vacuum apparatus temperature sensor assembly of claim 1 or 2, wherein said sheet substrate is pliable to conform to an external surface of said vacuum apparatus.~~

~~4. The vacuum apparatus temperature sensor assembly of any preceding claim, wherein said sheet substrate is a planar sheet.~~

~~5. The vacuum apparatus temperature sensor assembly of any preceding claim, wherein said sheet substrate has a length which is longer than its width.~~

~~6. The vacuum apparatus temperature sensor assembly of any preceding claim, wherein said sheet substrate has a width which is greater than a distance between heater elements of said vacuum apparatus.~~

~~7. The vacuum apparatus temperature sensor assembly of any preceding claim, wherein said sheet substrate has a length which is greater than a length of said external surface of said vacuum apparatus.~~

~~8. The vacuum apparatus temperature sensor assembly of any preceding claim, wherein said sheet substrate has a length which provides for a plurality of turns around said vacuum apparatus.~~

3~~9~~. The vacuum apparatus temperature sensor assembly of ~~any preceding~~ claim 2, comprising an outer insulating layer overlying said sheet substrate and said temperature sensor ~~wherein said sheet substrate is configured~~ to provide a greater thermal conductivity across ~~its~~ said sheet substrate ~~surface~~ than between said plurality of turns.

4~~10~~. The vacuum apparatus temperature sensor assembly of ~~any preceding~~ claim 2 or 3, wherein said sheet substrate has a thermal conductivity selected to ~~which~~ reduce~~s~~ a temperature variation across a surface of said sheet substrate

~~surface~~ compared to a temperature variation across a surface of said vacuum apparatus.

5~~11~~. The vacuum apparatus temperature sensor assembly of any ~~preceding claim~~ one of claims 2 to 4, wherein said sheet substrate has a thermal mass ~~which~~ selected to be ~~is~~ lower than a thermal mass of said vacuum apparatus.

~~12. The vacuum apparatus temperature sensor assembly of any preceding claim, wherein said sheet substrate is interposed between said temperature sensor and said vacuum apparatus.~~

6~~13~~. The vacuum apparatus temperature sensor assembly of any ~~preceding claim~~one of claims 2 to 5, wherein said temperature sensor overlies said sheet substrate.

7~~14~~. The vacuum apparatus temperature sensor assembly of any ~~preceding claim~~one of claims 2 to 6, wherein said sheet substrate has a thermal conductivity selected to be ~~which is~~ greater than a thermal conductivity of said vacuum apparatus.

~~15. The vacuum apparatus temperature sensor assembly of any preceding claim, wherein said sheet substrate comprises an insulating layer.~~

~~16. The vacuum apparatus temperature sensor assembly of claim 15, wherein sheet insulating layer is disposed on said sheet substrate.~~

~~17. The vacuum apparatus temperature sensor assembly of any preceding claim, comprising an outer insulating layer overlying said sheet substrate and said temperature sensor~~.

~~18. A method, comprising:~~

~~conforming a sheet substrate to a shape of a vacuum apparatus whose temperature is to be determined; and~~

~~thermally coupling a temperature sensor with said sheet substrate to provide a thermal path from said vacuum apparatus to said temperature sensor.~~