CLAIMS:

1. An electrochemical cell stack comprising:

a plurality of stacked cell units, each defining an external perimeter;

a housing surrounding the stack to define or enclose a volume around the external perimeters;

two opposed electrically insulating boards located between the housing and the plurality of stacked cell units, each being against one of two opposing sides of the plurality of stacked cell units; and

at least one electrically insulating beam that extends across multiple cell units of the stack, and engages against the external perimeters of those respective multiple cell units,

wherein:

the electrically insulating beam also engages against either or both the housing and one of the electrically insulating boards;

the electrically insulating beam extends generally in a stacking direction of the stacked cell units;

the electrically insulating beam is located between the external perimeters of the cell units and the housing; and

an electrical connection member of the cell stack's current delivery system extends inside the electrically insulating beam.

~~2. The cell stack of claim 1, wherein the electrical connection member extending inside the beam is a bus bar connected to a connection plate for the stack.~~

~~3. The cell stack of claim 1 or claim 2, wherein the electrical connection member extends beyond the beam to exit out of the housing through a top or bottom of the stack.~~

~~4. The cell stack of claim 1 or claim 2, wherein a further conductor connects to the electrical connection member, and that further conductor exits out of the housing.~~

2~~5~~. The cell stack of any preceding claim, comprising:

at least two electrically insulating beams each extending across a multiple of the cell units, and each engaging against the external perimeters of at least two of those respective multiple of cell units,

wherein the beams define a line that extends between the two beams, which line defines a lateral line across the respective cell units,

and wherein either or both:

a) the tangents of contact between each beam and the respective ones of the multiple of cell units are co-operative to resist movement of the respective ones of the multiple of cell units both in both lateral directions along that defined lateral line of the cell unit and in at least one longitudinal direction that lies both generally perpendicular to that lateral line and generally planar to the external perimeter of that respective cell unit; or

b) the tangents of contact of each beam with the respective ones of the multiple cell units being co-operative for each beam to resist movement of the respective one of the multiple cell units both in at least one lateral direction along that defined lateral line of the cell unit and in at least one longitudinal direction that lies both generally perpendicular to that lateral line and generally planar to the external perimeter.

36. The cell stack of any one of the preceding claims, wherein the or each board that engages edges of the cell units has a cell engaging face that provides that engagement, the beam closest to that cell engaging face of one of the boards having a cell engaging surface that extends distal of that board's cell engaging face.

47. The cell stack of claim 36, wherein there are two beams and each has a cell engaging surface that extends distal of its closest board's cell engaging face, the two beams providing a constriction across the width of the cell units between the two beams compared to the width between the two boards.

58. The cell stack of any one of the preceding claims, wherein each electrically insulating board is also in engagement with the inner wall of the housing.

69. The cell stack of any one of claims 1 to 57, wherein two or more boards are provided between each opposing side of the plurality of stacked cell units and the housing.

710. The cell stack of any one of the preceding claims, wherein the electrically insulating boards are located to just two of the sides of the stacked cell units.

~~11. The cell stack of claim 10, wherein the two sides of the stacked cell units are parallel opposing sides.~~

8~~12~~. The cell stack of any one of the preceding claims, wherein more than one electrically insulating board is located side by side, or one above the other, in a common plane, against each of two respective opposing sides of the stacked cell units.

9~~13~~. The cell stack of any one of the preceding claims, wherein the or each beam is formed of two or more parts.

10~~4~~. The cell stack of any one of the preceding claims, wherein a length of the or each beam is adjustable.

~~15. The cell stack of any one of the preceding claims, wherein the or each beam is provided with a slot in a part thereof.~~

11~~6~~. The cell stack of any one of the preceding claims, wherein the or each beam has one or more cut-away section to increase fluid flow in that area.

12~~7~~. An electrochemical cell stack assembly comprising:

a stack of cell units, each defining an external perimeter;

a housing surrounding the external perimeters of the stacked cell units to define a volume around the external perimeters, the housing initially comprising at least two separate parts;

at least one electrically insulating beam assembled between one initially separate part of the housing and the stacked cell units, the electrically insulating beam extending across a multiple of the cell units, and abutting the external perimeters of at least two of the multiple of cell units so as to exert a force that resists movement of the multiple of cell units further towards the beam;

wherein the first and second initially separate parts of the housing clamp or engage the at least one beam against the external perimeters of those at least two of the multiple of cell units upon closing two parts of the housing together.

~~18. The cell stack of claim 17, wherein the at least two parts of the housing are welded together in that clamping state to retain the clamping force.~~

~~19. The cell stack of claim 17 or claim 18, further being in accordance with any one of claims 1 to 16.~~

~~20. The cell stack of any one of the preceding claims, wherein the beam is full height relative to the stack of cell units.~~

~~21. The cell stack of any one of the preceding claims, wherein the beam contacts at least 50% of the cell units in the stack of cell units.~~

~~22. The cell stack of any one of the preceding claims comprising two electrically insulating beams that mirror across a lateral width of the cells units.~~

~~23. The cell stack of any one of the preceding claims wherein one or more of the electrically insulating beams are located at or near a downstream end of cell units, relative to the airflow or oxidant flow direction through the stack.~~

~~24. The cell stack of any one of claims 1 to 22, wherein one or more of the electrically insulating beams are located at or near a hotter, in use, end of the cell units to assist with cooling that hotter end by deflecting and concentrating airflow at that hotter end.~~

13~~25~~. The cell stack of any one of the preceding claims, wherein the at least one beam defines a barrier for fluid flow entering or exiting the stacked cell units, blocking or reducing fluid flow around the outside of the beam between the external perimeter of the cell units and the housing, and to direct the flow of fluid through or towards a central stream through the stacked cell units.

~~26. The cell stack of any one of the preceding claims, wherein the at least one beam defines a barrier for fluid flow entering or exiting the stacked cell units, whereby there is a concentration of airflow through a central stream through the stacked cell units and a lesser airflow to the sides of the central stream, adjacent the sides of the cell units.~~

14~~27~~. The cell stack of any one of the preceding claims, wherein the at least one beam sits in concavities or recesses formed in the external perimeters of the cell units.

~~28. The cell stack of claim 27, wherein the concavities or recesses wrap around at least a 90 degree segment of its respective beam.~~

15~~29~~. The cell stack of any one of the preceding claims, wherein the housing comprises a skirt around the cell units and the skirt is formed of at least two parts, joined together at their seams – for example by welding.

~~30. A cell stack assembly comprising a cell stack as defined in any one of the preceding claims, a fuel delivery port connecting to a first fluid passageway within the cell stack, an oxidant delivery port connecting to a second fluid passageway within the cell stack, current collector plates for collecting or delivering electrical current from or to the cell stack, and an electrical connection member for delivering the current out of or into the housing from or to the collector plates.~~

16~~31~~. A method of assembling an electrochemical cell stack, the method comprising providing:

cell units, each cell unit defining an external perimeter; and

at least one electrically insulating beam, for assembly against the cell units such that the electrically insulating beam extends across a multiple of the stacked cell units, and to engage against the external perimeters of those respective multiple cell units, with an electrical connection member of the cell stack's current delivery system extending inside the electrically insulating beam;

the method comprising:

fitting a first part of the electrically insulating beam over the electrical connection member, stacking the cell units against the first part of the electrically insulating beam, and then fitting a second part of the electrically insulating beam over the electrical connection member and the first part of the electrically insulating beam.

~~32. The method of claim 31, wherein the or each beam is formed from at least two separate parts.~~

~~33. The method of claim 31 or claim 32, wherein the or each beam has one or more cut-away section to increase fluid flow in that area within stack.~~

~~34. The method of any one of claims 31 to 34, wherein the length of the or each beam is adjustable.~~

~~35. The method of any one of claims 31 to 34, wherein one or more part of the or each beam is provided with a slot in its sidewall.~~

1736. A method of assembling an electrochemical cell stack, the method comprising providing:

stacked cell units, each cell unit defining an external perimeter; and

at least two electrically insulating beam, assembled against the stacked cell units such that each electrically insulating beam extends across a multiple of the stacked cell units, and engages against the external perimeters of those respective multiple cell units

the method comprising;

fitting a housing around the stacked cell units and the electrically insulating beam, the housing defining a volume around the external perimeters, the housing being initially in at least two separate parts;

wherein:

the first and second initially separate parts of the housing are clamped against the external perimeters of those at least two of the multiple of cell units upon closing two parts of the housing together to exert a force that resists movement of the multiple of cell units further towards the beams and the initially separate parts are then connected or joined together in that clamping state to retain the clamping force by the beam against the external perimeters of those at least two of the multiple cell of cell units.

1837. The method of claim 1736, wherein there are at least two electrically insulating beams;

one electrically insulating beam is assembled between a first initially separate part of the housing and the stacked cell units, and a second of the electrically insulating beams is assembled between a second initially separate part of the housing and the stacked cell units, the at least two electrically insulating beams each extending across a multiple of the cell units, and abutting the external perimeters of at least two of the multiple of cell units so as to exert a force that resists movement of the multiple of cell units further towards the beams; and

the first and second initially separate parts of the housing are clamped against the external perimeters of those at least two of the multiple of cell units upon closing two parts of the housing together to exert a force that resists movement of the multiple of cell units further towards the beams and the initially separate parts are then connected or

joined together in that clamping state to retain the clamping force by the beams against the external perimeters of those at least two of the multiple of cell units.

19~~38~~. The method of claim 17~~36~~ or claim 18~~37~~, wherein the first and second initially separate parts of the housing are clamped indirectly against the external perimeters of those at least two of the multiple cell of cell units via one or more electrically insulating boards in addition to the or each electrically insulated beam.

20~~39~~. The method of any one of claims 17~~36~~ to 19~~38~~, wherein the beam or beams engages against the external perimeters in recesses in those external perimeters.

~~40. The method of any one of claim 31 to 39, wherein the cell stack is in accordance with any one of claims 1 to 29.~~