Claims

We Claim:

1. A corrugated construction element (100) having a base profile (101) connected to at least one leg profile (102a) or (102b), wherein ~~at least one of~~ the base profile (101) and the at least one leg profile (102a) or (102b) comprise~~s~~ an array of angular corrugations (110) extending across their surface in a non-parallel direction to the principal axis L of the corrugated construction element (100) covering a surface area greater than 25% and less than or equal to 100% of the total surface area of the corrugated construction element (100), thereby increasing the effective thickness of the corrugated construction element with respect to the flat sheet material of which it is made, wherein the array of angular corrugations (110) on the at least one leg profile (102a) or (102b) ~~are~~ is at an angle Y ranging between 15° and 75° from the principal axis L of the corrugated construction element (100), ~~wherein~~characterized in that the array of angular corrugations (110) comprises ~~of~~ at least one first set of angular~~array of~~ corrugations(D1) and at least one second ~~array of~~ set of angular corrugations (D2) having an angle X there between ranging from 30 to 150 degrees.

2. The corrugated construction element (100) as claimed in claim 1, wherein the array of angular corrugations (110) covers a surface area greater than 50% and less than 75% of the total surface area of the corrugated construction element (100).

3. The corrugated construction element (100) as claimed in claim 1, wherein ~~the at least one first array of~~ the angular corrugations of the array of angular corrugations (110) ~~and the at least one second array of corrugations~~ are V-shaped, wherein the bottom of the V-shaped corrugations ~~are~~is curved or pointed.

4. The corrugated construction element (100) as claimed in claim 3, wherein the at least one first set of ~~array of~~ angular corrugations and the at least one second set ~~array~~ of angular corrugations run in opposite directions from the edges of the corrugated construction~~corrugation construction~~ element so that each angular corrugation from the first set of angular corrugations meets with a corresponding angular corrugation from

the second set of angular corrugations to form the angle X between them. ~~meeting at angle X to form an array of V-shaped angular corrugations.~~

5. The corrugated construction element (100) as claimed in claim 1, wherein the at least one leg profile (102a) or (102b), is non-coplanar to the base profile (101).

6. The corrugated construction element (100) as claimed in claim 1, wherein each corrugation in the array of angular corrugations (110) ~~consists of~~comprises a V-shaped groove (120).

7. The corrugated construction element (100) as claimed in claim 6, wherein each V-shaped groove (120) ~~consists of~~comprises peaks (140) and/or troughs (150) that are sharp, blunt or curved.

8. The corrugated construction element (100) as claimed in claim 1, wherein the array of angular corrugations (110) ~~have~~has a pitch P ~~distance between two consecutive peaks or troughs~~ ranging between 2 mm and 6 mm.

9. The corrugated construction element (100) as claimed in claim 1, wherein one or more V-shaped cross sections of the array of angular corrugations (110) ~~have~~has a height H ranging between 0.1 mm and 1 mm.

10. The corrugated construction element (100) as claimed in claim 1, wherein the ~~at least one leg profile includes a~~ first leg profile (102a) and ~~a~~the second leg profile (102b) ~~which~~ have different heights from each other such that two identical corrugated construction elements (100) can be joined to form a rectangular corrugated construction element (200).

11. A wall construction (500) comprising:
    a frame (510) comprising:
    a plurality of corrugated construction elements (100) as claimed in claim 1;
    a floor channel (520) configured to receive a first end of each of the plurality of corrugated construction elements (100); and

a ceiling channel (530) spaced apart from the floor channel (520), wherein the ceiling channel (530) is configured to receive a second end opposite to the first end of each of the corrugated construction elements (100) in a horizontal plane, wherein the floor channel (520) and the ceiling channel (530) are made from ~~the~~ corrugated construction elements (100) as claimed in claim 1 and wherein the plurality of corrugated construction elements (100) are vertically and/or horizontally disposed at a predetermined distance between the floor channel (520) and the ceiling channel (530).

12. An apparatus (600) for forming a sheet material (700) into a profile ~~comprising an array~~ of ~~angular~~ a corrugation~~s~~ construction element (110) as claimed in claim 1, the profile comprising an array of angular corrugations (110) extending across at least 25% of the surface of the profile ~~of the corrugation construction element (100) as claimed in claim 1~~, the apparatus comprising:

a first roller (610) comprising:

a first corrugation region (630a) for forming one part of a first set of angular corrugations (D1), and

a second corrugation region (640a) for forming one part of a second set of angular corrugations (D2); and

a second roller (620) comprising:

a third corrugation region (630b) for forming the other part of the first set of angular corrugations (D1), and

a fourth corrugation region (640b) for forming the other part of the second set of angular corrugations (D2);

wherein the first roller (610) and second roller (620) are configured to mate with each other and wherein the angle between the first set of angular corrugations (D1) and the second set of angular corrugations (D2) ranges between 30 – 150 degrees, wherein the first corrugation region (630a) and third corrugation region (630b) co-operate with each other and the second corrugation region (640a) and fourth corrugation region (640b) co-operate with each other to form said sets of angular corrugations to effectively increase the thickness of the sheet material.

13. The apparatus (600) as claimed in claim 12, wherein the first and third corrugation regions (630a), (630b) ~~are co-operable and consist of~~comprise V-shaped grooves that correspond with each other.

14. The apparatus as claimed in claim 12, wherein the second and fourth corrugation regions (640a), (640b) ~~are co-operable and consist of~~ comprise V-shaped grooves that correspond with each other.

15. A method of manufacturing a profile ~~comprising an array~~ of a corrugation construction element (100) as claimed in claim 1, the profile comprising an array of angular corrugations (110) extending across at least 25% of the surface of the profile ~~of a corrugation construction element (100) as claimed in claim 1~~, the method (800) comprising:

passing a sheet material (770) between the first roller (610) and second roller (620) of the apparatus (600) as claimed in claim 12, wherein the sheet (770) is pressed against the ~~sets of angular corrugations present in the~~ V-shaped grooves present in the corrugation regions (630a), (630b), (640a), (640b) of the first roller (610) and second roller (620).