Title; Preliminary Approximation of the Net Free Ventilation Area (NFVA) Of Edging Systems Ltd Products for Roofing Ridge Venting

Introduction:

An Independent approved Laboratory received instructions to calculate the approximate Net Free Ventilation Area (NFVA) resulting from the use of Edging Systems Ltd soft edging material at the roofing ridge of dwellings.

Materials/Samples and Assumptions

Edging Systems Ltd soft edging material is a thin, partially perforated strip with backing material. The strip is overall ~63mm wide, of which ~43mm are perforated. For the purpose of this approximation the following assumptions were made:

· The strip is attached to the ridge material and the perforated areas are then pressed down to cover the profile of the roofing sheet.

· The portion of the strip that is used to cover the roofing profile is effectively equivalent to the width of the perforated strip (~43mm).

· The perforated strip does contain perforations, but these are very small and may be partially covered by backing material. Although it is acknowledged that they exist and therefore contribute to the NFVA they are for the moment and in the absence of a measured gap size approximated as 0.

· After the strip was pressed onto the profile of the roofing there will be a net effective gap between the roofing profile and the actual strip material. This entire area contributes to the NFVA.

Method

The NFVA was approximated as being the sum of three individual components:

1. Perforations

Pre-existing gaps in the perforated strip. In this preliminary approximation these perforations as treated as being overall close to 0, although it is acknowledged that the true value will be larger than that (by an assumed quite small amount).

2. Material Stretch

When the perforated portion of the strip is pressed onto the roofing profile the strip is being stretched. At the peaks of the roofing profile the strip width will be roughly retained whilst in the valleys of the roofing profile the perforated strip material will be stretch to cover an area larger than previous. The net shape that the perforated portion of the strip then takes due to the stretch was approximated as being the sum of many symmetric equal-sided trapezoid.

In practice and for the purpose of this preliminary approximation the two values for the base lengths of this trapezoid shape were derived from the original length of the sheet prior to forming the profile and the effective length of the formed and profiled sheet. The original length of the sheet prior to forming is frequently the same for many profiles as these sheets are standardised commodities. The effective length of the formed and profiled sheet will vary with the particular profile.

In this approximation the trapezoid dimensions were broken down to be calculated for a trapezoid covering the area formed by an individual half pitch repeat unit, two of these trapezoids covering the distance of the pitch. The sides remain the width of the perforated strip, the shorter base is equivalent to the formed half pitch length and the wider base is the half pitch length extended by a factor being the ratio of original sheet length over the formed sheet length.

The net NFVA contribution is then consequently the area of the trapezoid minus the area of the original rectangle formed by the perforated strip

3. Gap

As the perforated strip is pressed down onto the roofing profile it is assumed to not tightly meet the profile but effectively retain a gap between strip and profile. In this preliminary approximation the gap was calculated as being of effectively rectangular shape following the contours of the profile and width of an assumed gap size. Subject to literature this gap may vary from ~2.0mm to ~5.0mm.

The net NFVA contribution per formed sheet length is then consequently the rectangle formed by gap width times the original sheet length adjusted for linear metric meter

Relevant N.Z.M.R.M. 'Code of Practice' references;

Design; 4.3.2.	Use of Underlays and Vapour Barriers
Design; 4.3.4.	Cold Roof Construction
Design; 4.3.5.	Warm Roof Construction
Design; 4.3.8.	Horizontal Laying
Design; 4.3.9.	Vertical Laying
Design; 4.5.5.	Ventilation
Design; 4.6.	Ventilation
Design 4.6.1.	Intake Vents
Flashings; 5.2	Ridging
Flashings; 5.2.2.	Flashing Edges / Ridging
Flashings; 5.3.1.	Flashings/Ridge & Hip

Profile Type	Assumed Gap [mm]	Total Approximated NFVA per Linear Metre [mm2/m]	
		Roofing Profile	**Roofing Ridge**
Corrugate	2.00	4586	9171
	2.50	5142	10284
	3.00	5698	11396
	3.50	6254	12509
	4.00	6810	13621
	4.50	7367	14733
	5.00	7923	15846
True Oak Corrugate	2.00	4734	9468
	2.50	5294	10587
	3.00	5853	11707
	3.50	6413	12826
	4.00	6872	13945
	4.50	7532	15064
	5.00	8091	16183
Trim Rib	2.00	4832	9664
	2.50	5405	10810
	3.00	5978	11957
	3.50	6552	13103
	4.00	7125	14250
	4.50	7698	15396
	5.00	8271	16542