MINISTÈRE
DE LA TRANSITION
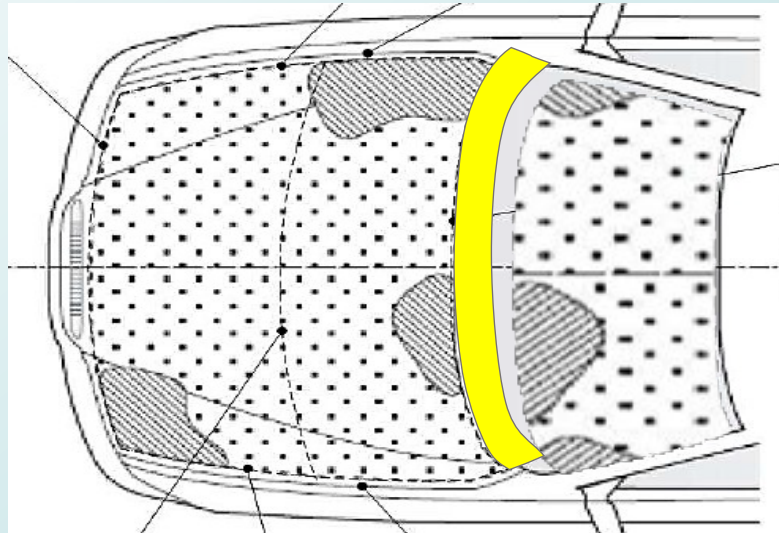ÉCOLOGIQUE
Liberté
Égalité
Fraternité

UTAC

UN-R127-03 Supplement 1 proposal

Windscreen & cowl test area clarifications (UTAC's questions)

1/ Windscreen: figure, third & Upper corners

2/ Cowl: lateral limits, third & overlap of impactors
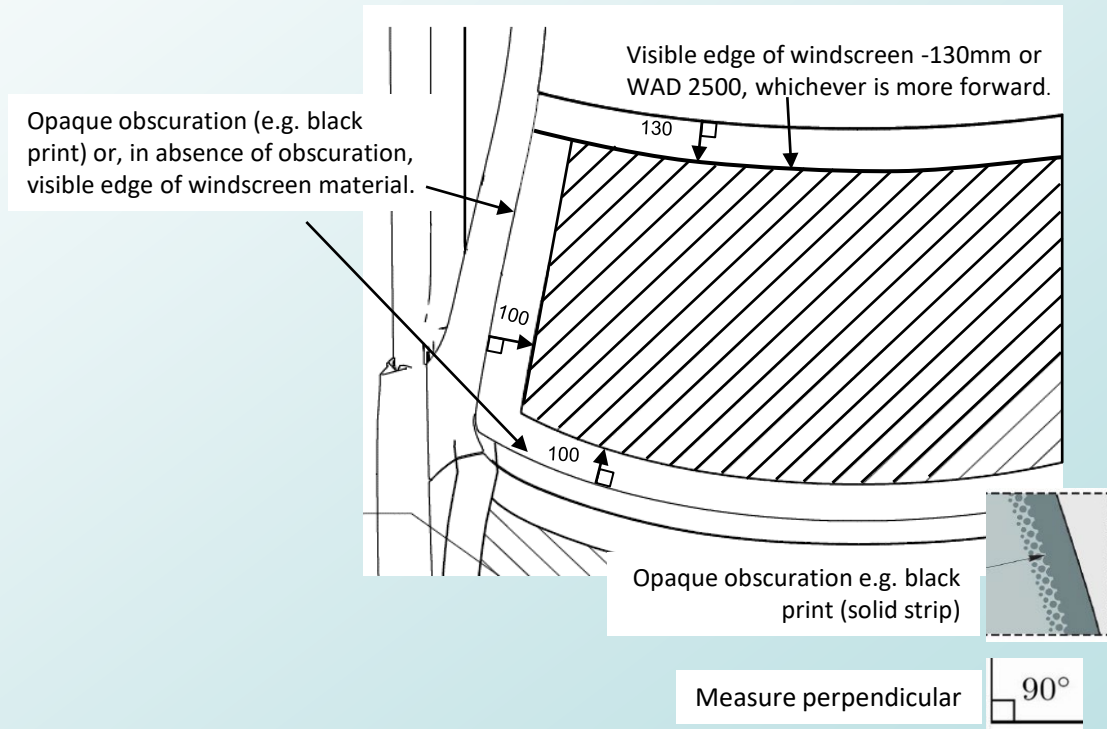
3/ Jerk criteria : graph & formula

1a) **Windscreen** test area: **figure**

➤ Figure 12 to add in §2.44

Figure 12
Windscreen test area

Visible edge of windscreen -130mm or WAD 2500, whichever is more forward.

Opaque obscuration (e.g. black print) or, in absence of obscuration, visible edge of windscreen material.

130

100

100

Opaque obscuration e.g. black print (solid strip)

Measure perpendicular 90°

1b) Windscreen: **Third**

➢ Proposal to define the third of the windscreen:

2.49 "Third of the windscreen test area" means the geometric trace of the area between the lateral boundaries of the windscreen test area as defined in §2.44.(c), measured with a flexible tape following the outer contour of the windscreen on any transverse section, divided in three equal parts.

Reminder : UN R127-03 § 2.44. (c)

"**2.44. "Windscreen test area" is an area on the outer surface of the windscreen. It is bound: (…)**

(c) At each side, by a line 100 mm inside the opaque obscuration of the windscreen. In case of absence of the opaque obscuration, the line is measured from the side visible edge of the windscreen material.
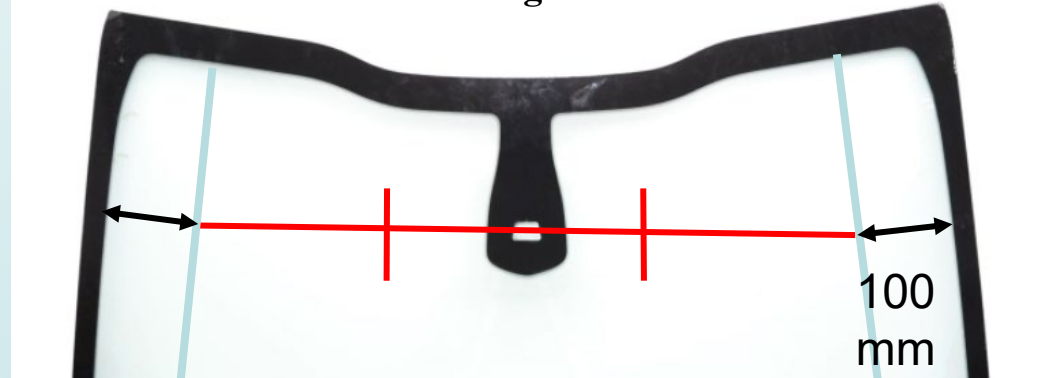
If the test area cannot be drawn, upper corners are defined by the "bonnet template":

Where the lines defined in (b) and (c) do not intersect, they should be extended and/or modified using the semi-circular template defined in 2.8., as shown in Figure 13.

The template should be placed on the vehicle with corners "A" and "B" turned to the front of the vehicle, and Points "C" and "D" to the rear and with line AB parallel to the median transversal plane of the vehicle. The template should be slid progressively rearwards ~~transversally~~ until the arc of the template makes first contact with the line defined in (b).

Ensuring line AB remains parallel to the median transversal plane and first contact of the template with line defined is (b) is maintained, the template should be slid progressively transversally ~~rearwards~~ until the arc of the template makes first contact with the line defined in (c). Throughout the process, the template should be curved to follow, as closely as possible, the outer contour of the vehicle's windscreen, without wrinkling or folding of the template. Then the contour of windscreen test area is extended and/or modified to follow the circumferential arc of the template to meet the line defined in (c), as shown in Figure 13.

If the template cannot make simultaneous contact with lines defined in (b) and (c), then additional templates should be used where the radii are increased progressively in increments of 20 mm, until simultaneous contact with lines defined in (b) and (c) are achieved.

Figure 13
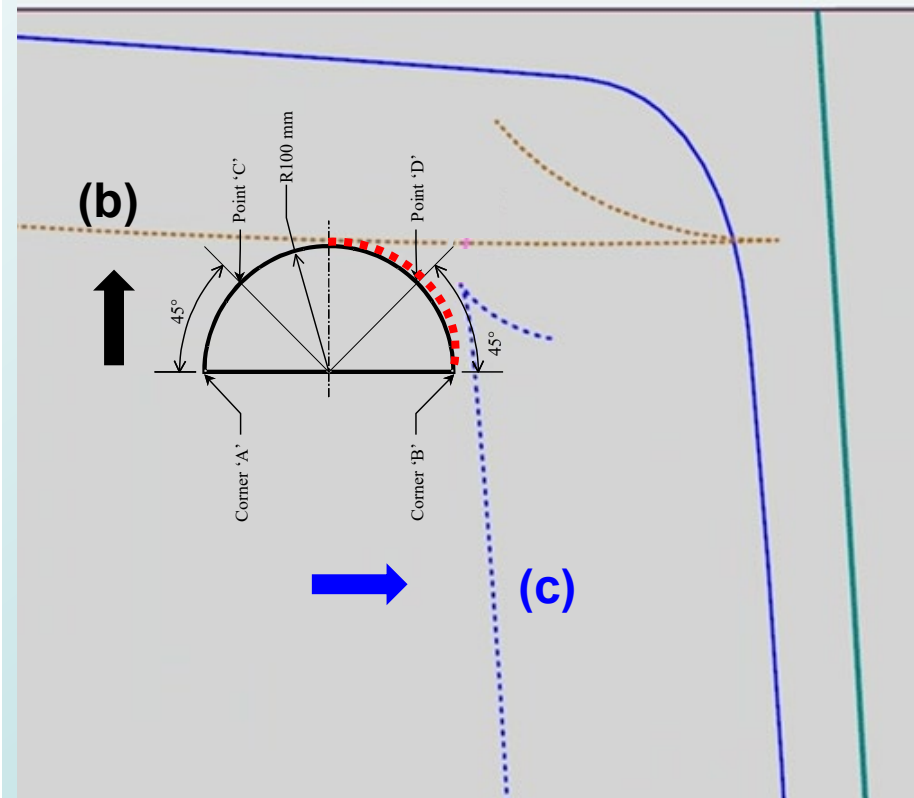
2a) **Cowl** monitoring area: **Lateral limits**

Figure 14:
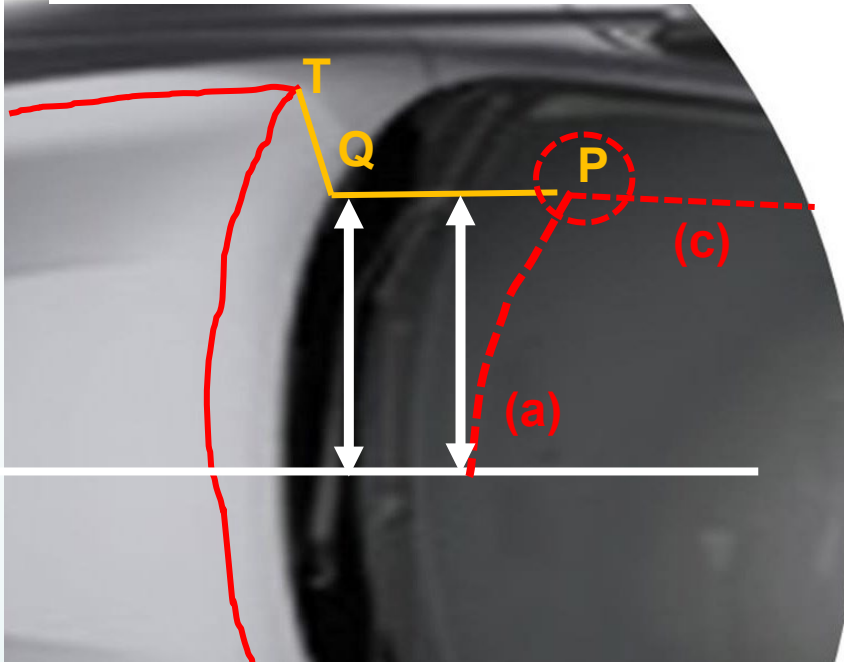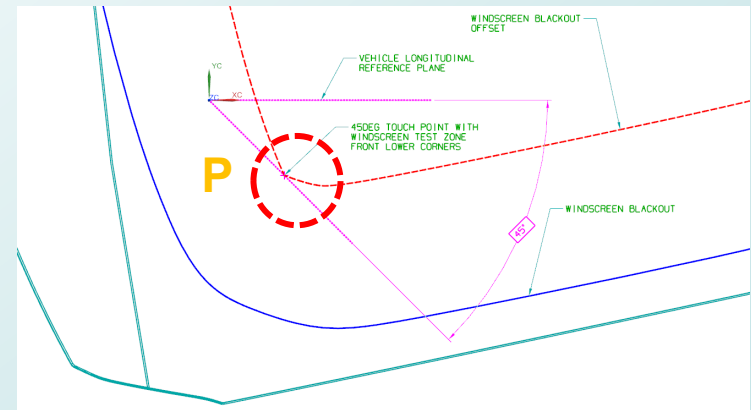**lateral limits of the cowl monitoring area**

Figure 15:
Particular case, if no unique "P point" corner:

➢ **Proposal to define the cowl lateral limits:**

In order to generate the lateral boundary of the cowl monitoring area (see Figure 14), at each side:
- the "P corner point" will be projected forward to the rear edge of the bonnet top and create Q point;
-    the Q point will be connected to the "T point" (rear corner of the bonnet top test area);
using a flexible tape held tautly from point P to Q and on the outer surface of the vehicle from point Q to T.
If there is no unique "P point" where the lines defined in 2.44 (a) and (c) intersect, then the "P point" is defined by the first contact made by a 45° line, as shown in Figure 15.

2b) **Cowl** monitoring area: **Third**

➢ Proposal to define the third of cowl monitoring area:

2.50. "Third of Cowl monitoring area" means the distance between the lateral boundaries of the cowl monitoring area as defined in §2.45, measured on any transverse section, divided in three equal parts.

Third of cowl monitoring area
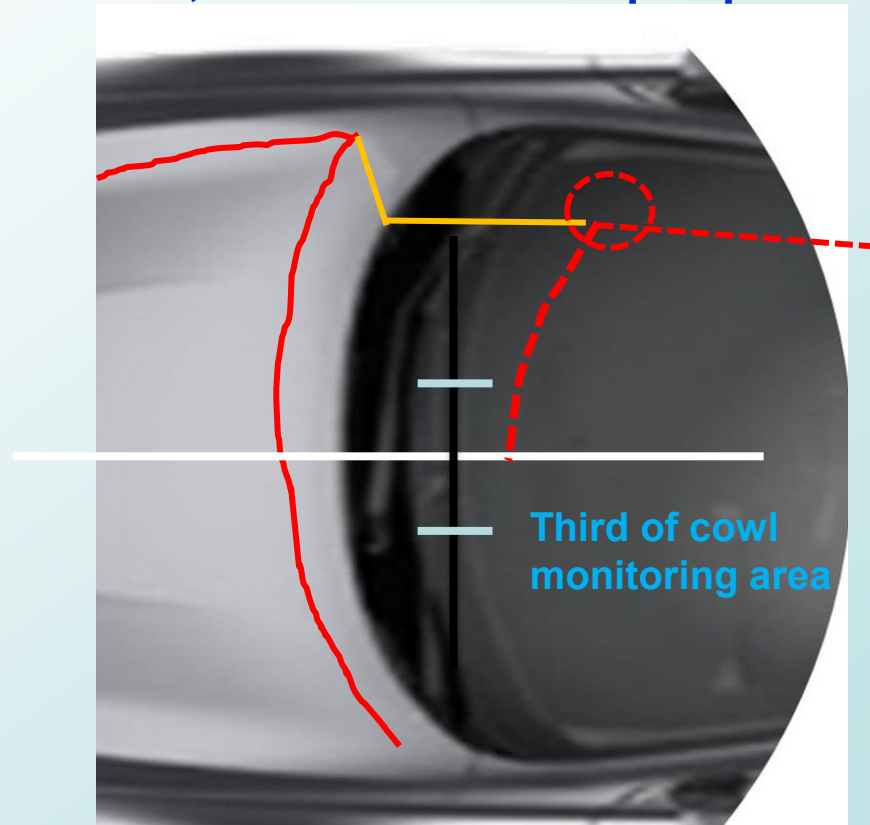
2c) **Cowl** monitoring area: **impactors overlap**

Depending on the size of vehicles, the adult & child cowl monitoring area may overlap. Need to clarify which impactor to use:

➢ For windscreen test area, UN R127-03 adopted:

- **Tests assigned to any measuring points located in the windscreen area forward of and including WAD 1,700 are performed with the child headform impactor. Tests assigned to any measuring points located in the windscreen area rearward of WAD 1,700 are performed with the adult headform impactor.**

➢ **add this text directly in § 2.45 (cowl)**

# 3) **jerk criteria** clarification

Add following formula and figure to § 2.48.

2.48.   "Atypical windscreen fracture behaviour" is where the headform to windscreen impact results in at least one of the following cases:

(a) The absolute value of the minimum value of the derivation of the headform acceleration versus time is below 180 g/ms for the first 4 ms after the initial contact of the headform to the windscreen, **as shown in Figure 16** ; or

Figure 16: Jerk criteria graph and formula

$$\left| \min \left(\frac{da}{dt} \right) \right| < 180 \text{g/ms, for } 0 < t < 4\text{ms}$$

Jerk criteria
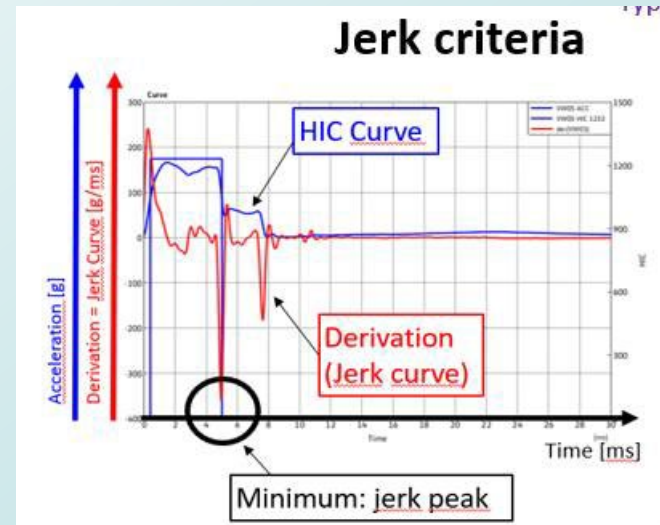
(b) The minimum value of the acceleration below 300 m/s² between the initial peak and 10 milliseconds is reached later than 4 ms in the time/acceleration plot, or glass breaking which expands to whole windshield is not visibly observed."

I.DAUSSE (Renault) for OICA GESP 70 (Dec 2021)

ANNEXES

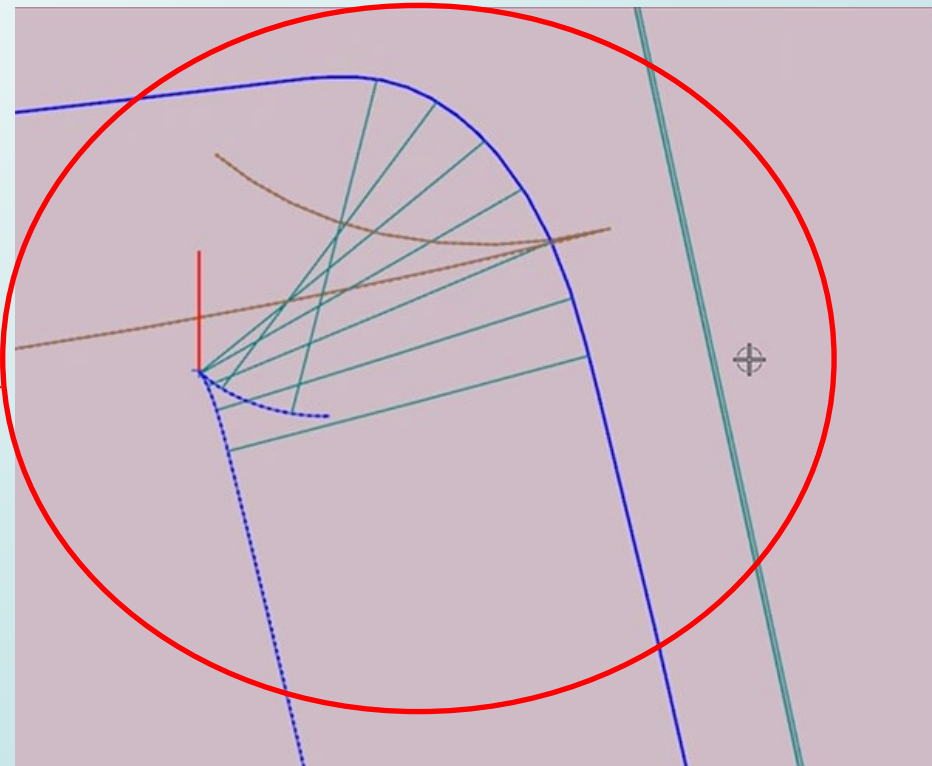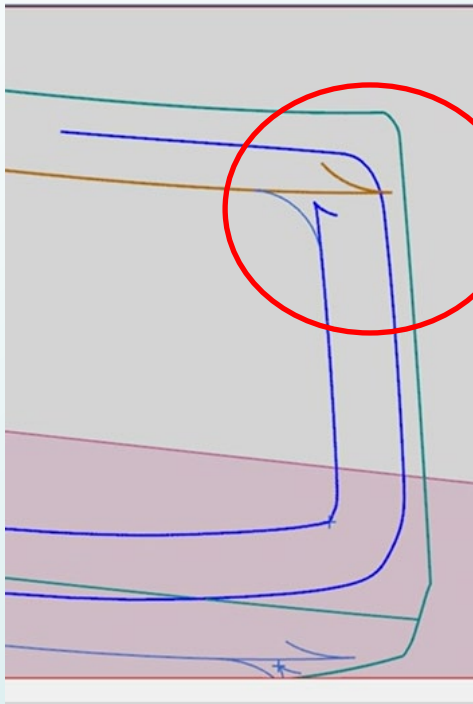1c) Windscreen test area: **upper corners**

1c) Windscreen test area: **upper corners**

Problem: no "corner"

Splines are 90° offset from
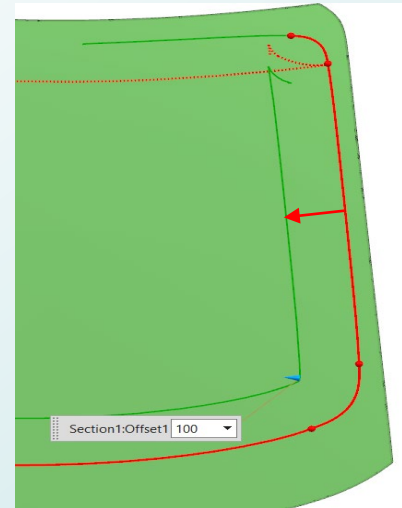- Side blackprint → blue side limit
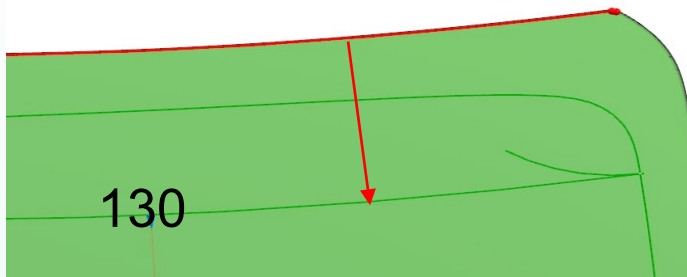- Rear visible edge → brown rear limit
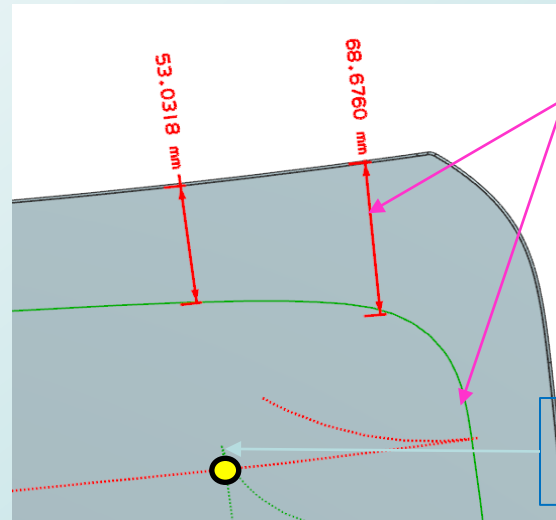
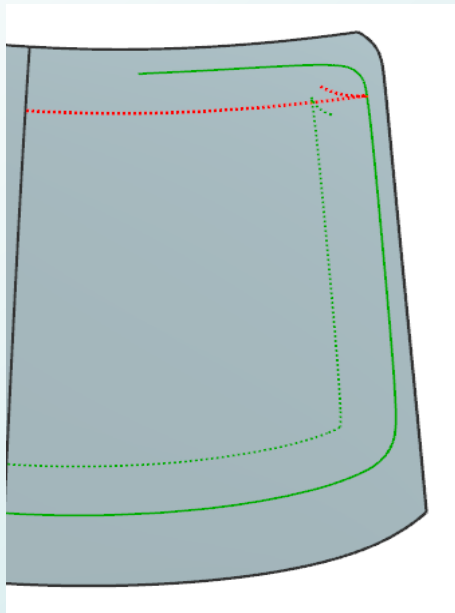=> **With 2 "hook shapes" which do not intersect.**

1c) Windscreen test area: **upper corners**

Notice how splines are giving a different type of offset feedback when offset 90° to spline

130

Section1:Offset1 100

Highly dependent on how far forward the blackout starts from the rear edge of glass, how far down the side the corner arc (spline) reaches, and radius of corner arc

53.0318 mm

68.6760 mm

Small overlap for intersection - Potential for no intersection