

Complex Topology and Class-A Surface Modeling with Inventor

Paul Munford

Application Engineer – Graitec UK
@Cadsetterout

Class summary

From 'Hack and Whack' to 'Planned and perfect' complex topology with Autodesk Inventor.

Learning Objectives

- Learn how to use the language of curvature continuity with confidence
- Discover Inventor software's hidden surfacing tools
- Learn how to build complex topology from individual surface patches
- Learn how to convert surfaces into a solid model



Paul.Munford@Graitec.co.uk

@Cadsetterout



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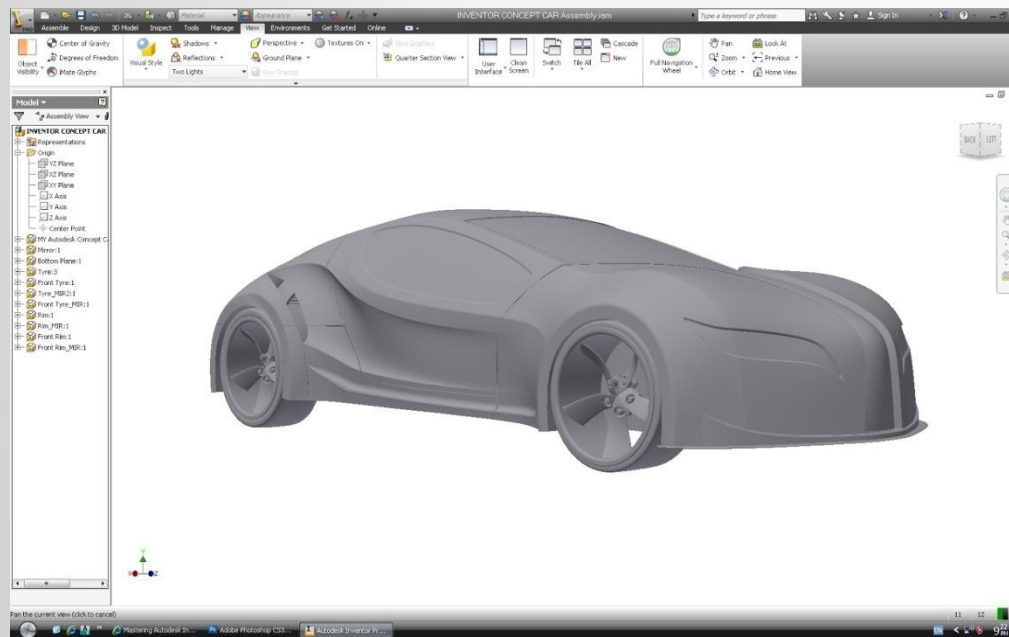


What is surfacing?



[Mindagus Petrikas](http://a-design.blogspot.com/)

<http://a-design.blogspot.com/>

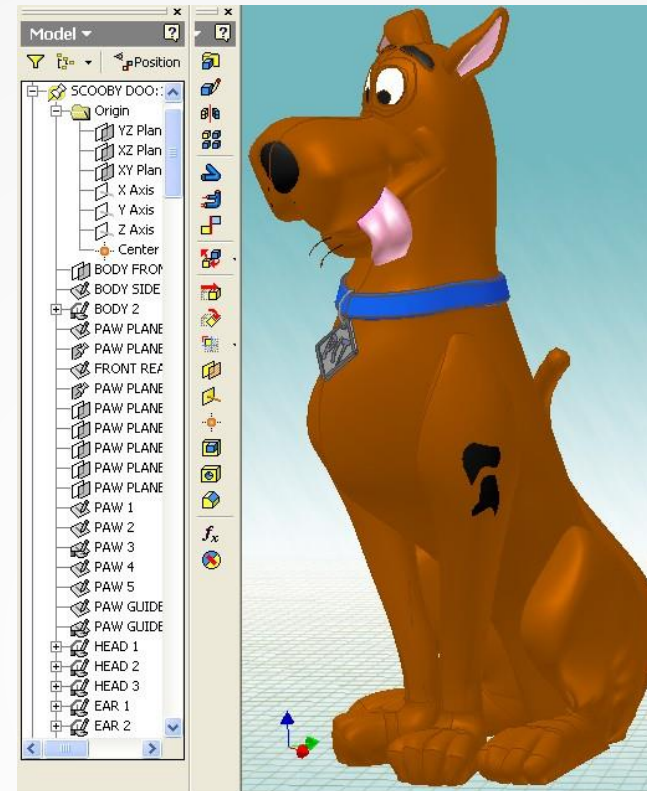


[Ellipses blog](#)



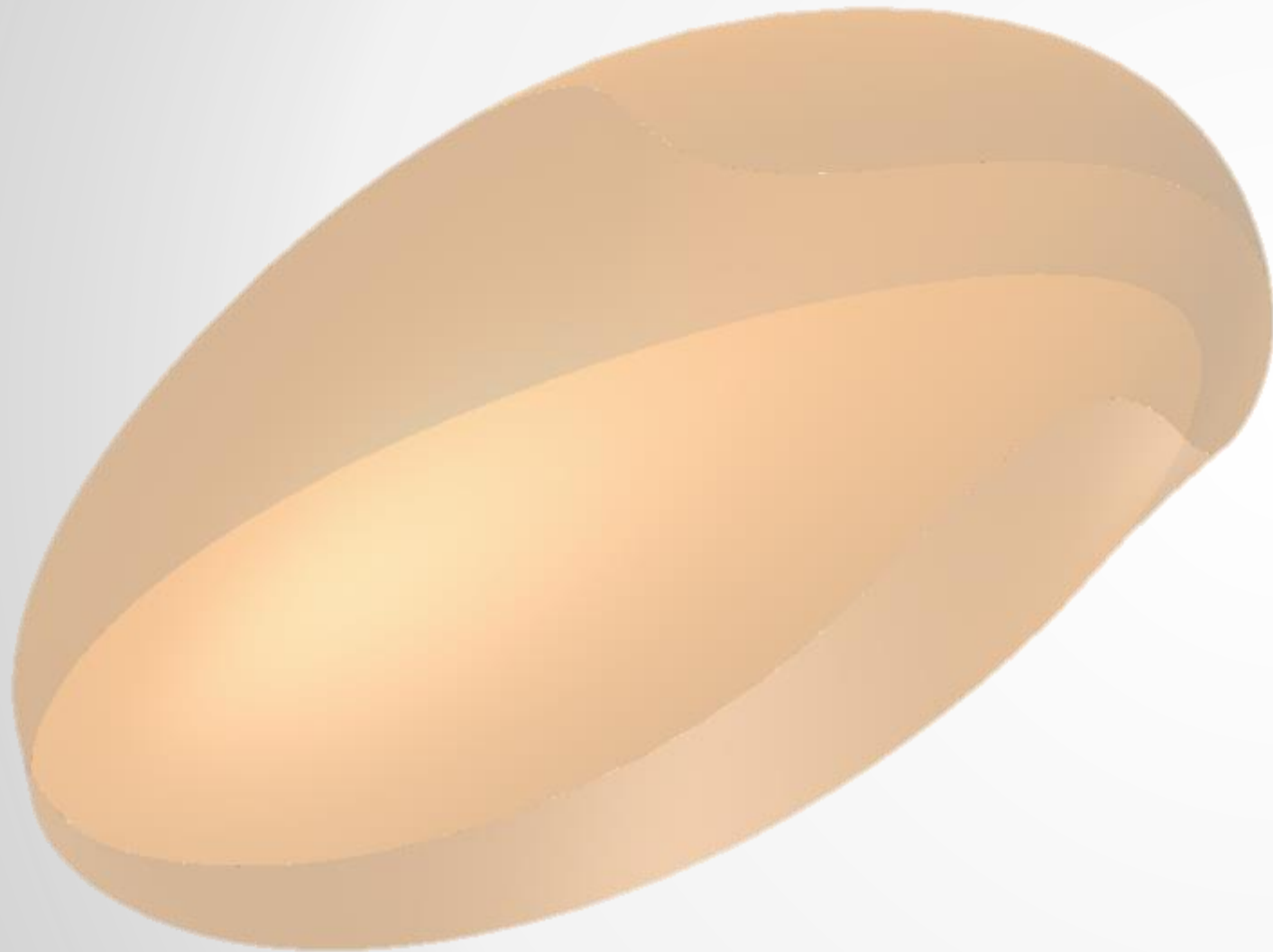
[J.D Mather](#)

A method of creating complex shapes with your CAD package, one surface patch at a time.



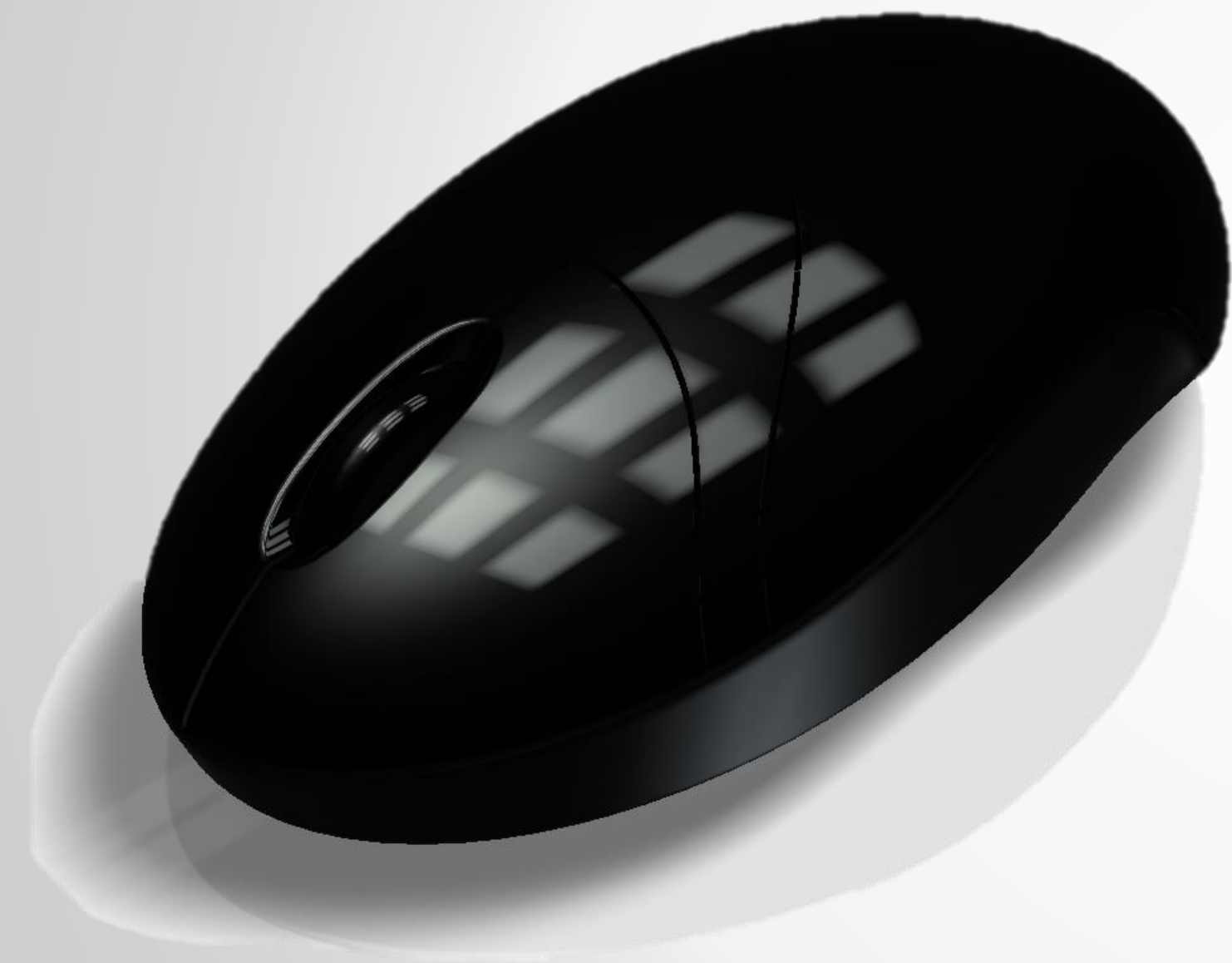
What is a surface?

an infinitely thin 'skin' stretched between boundary geometry.

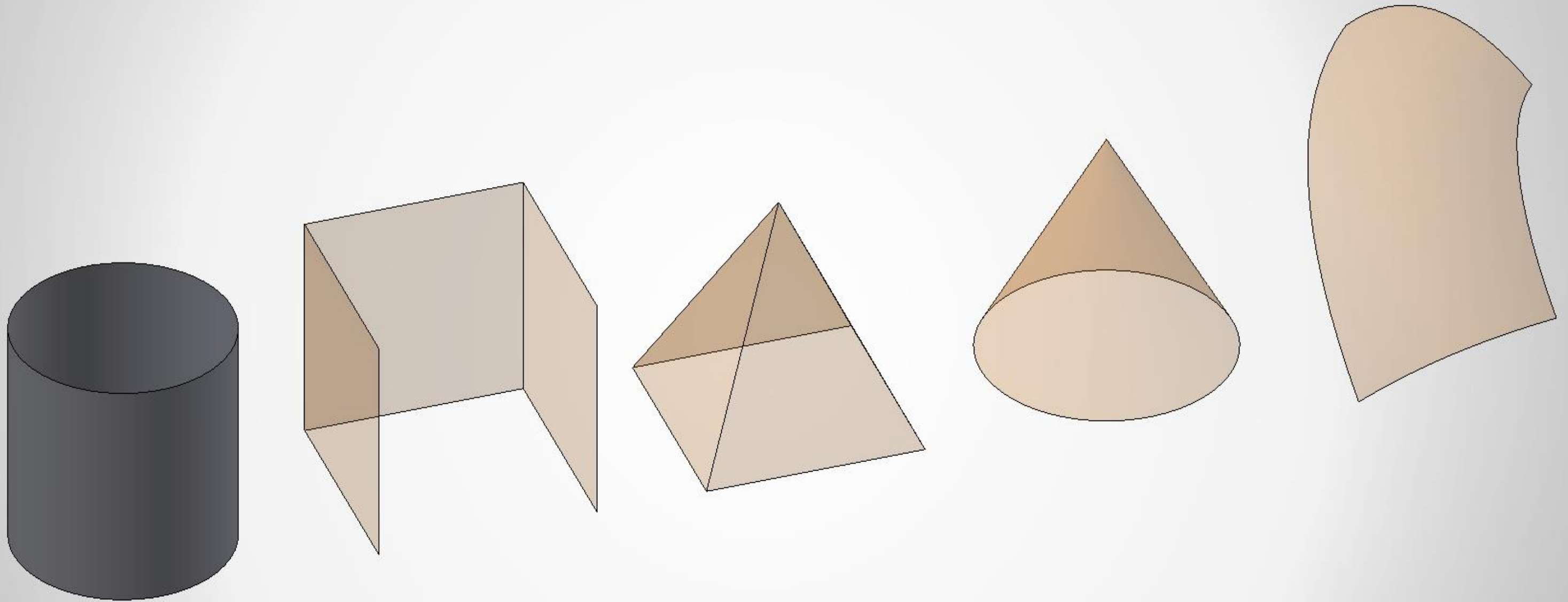


What is a solid?

An enclosed volume, completely surround by faces



Prismatic Vs Nurbs surfaces




Why Inventor?

Because that's all we've got!

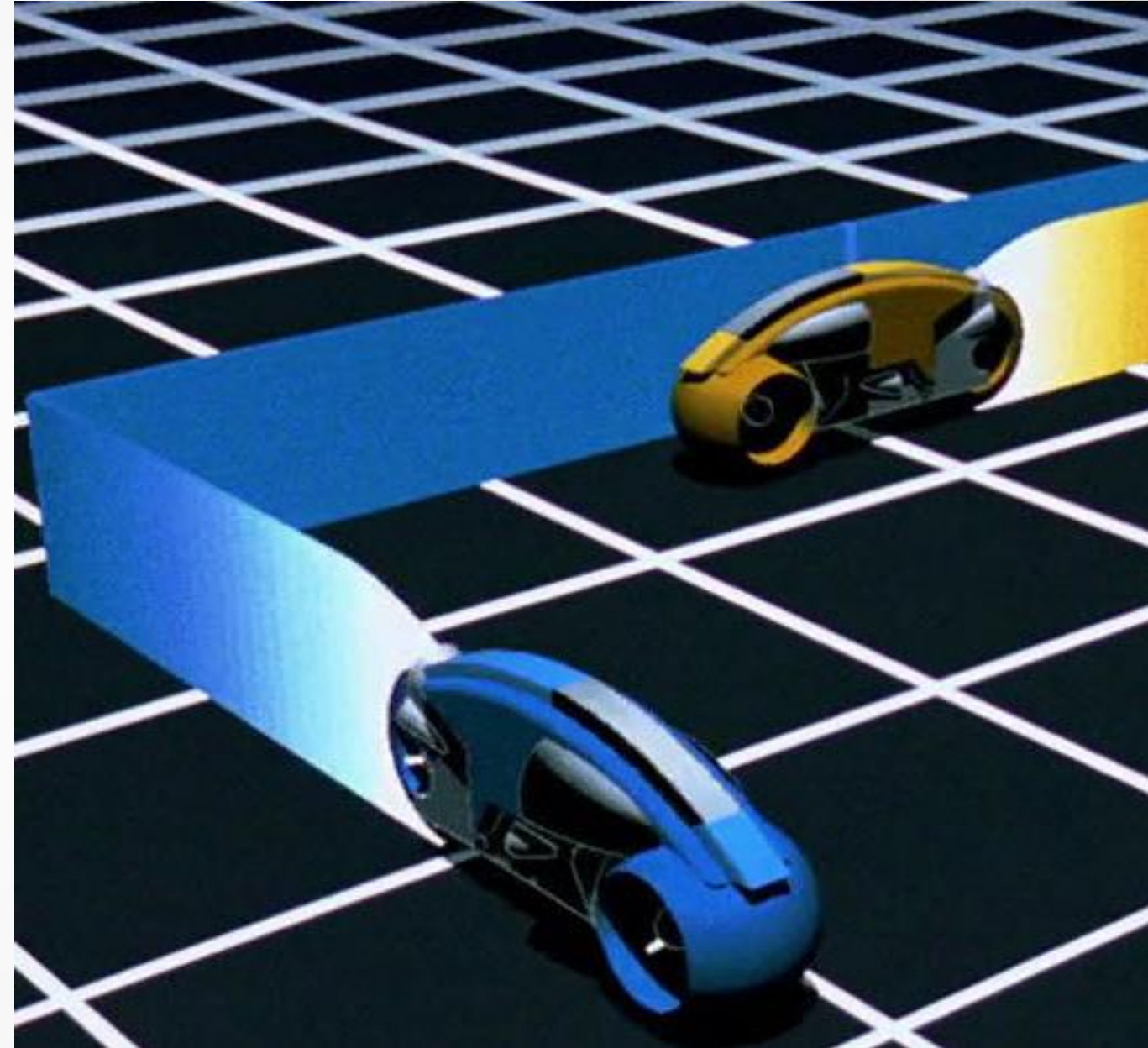
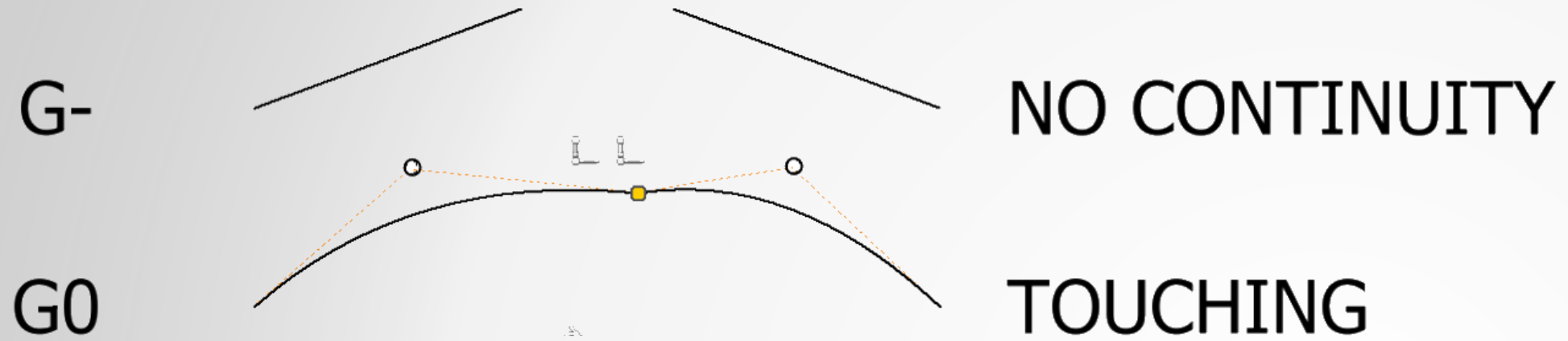
The Language of surface continuity

2D Curvature Continuity

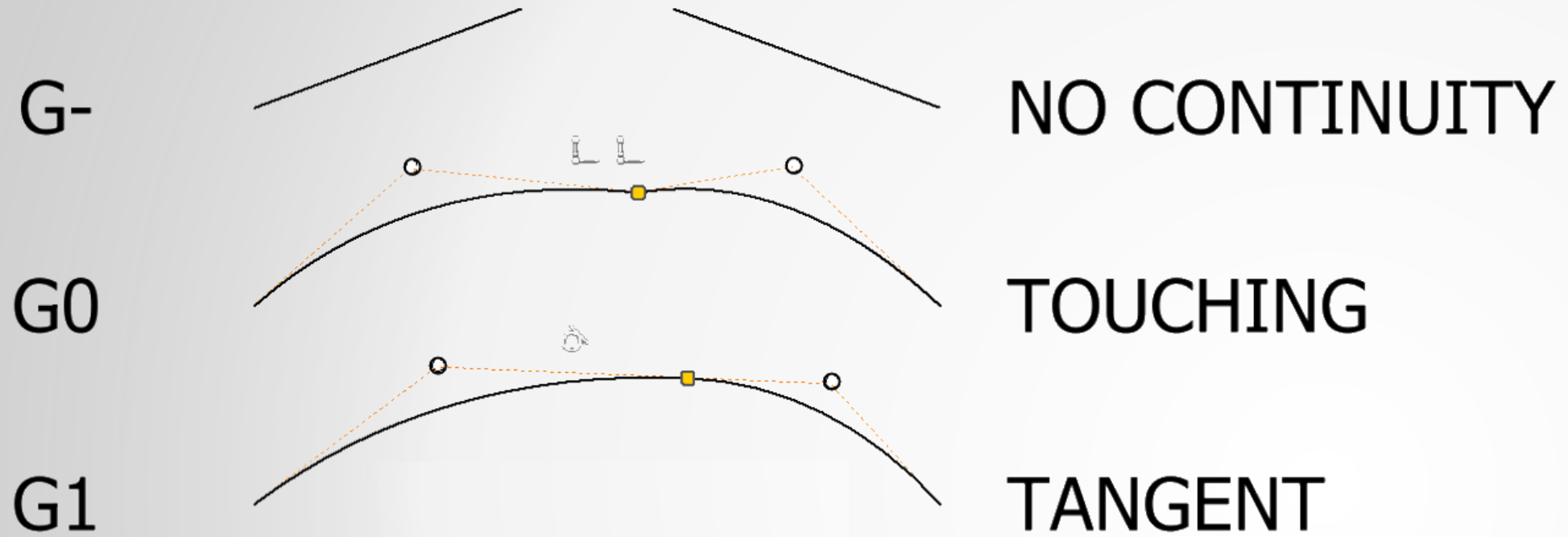
G-  NO CONTINUITY



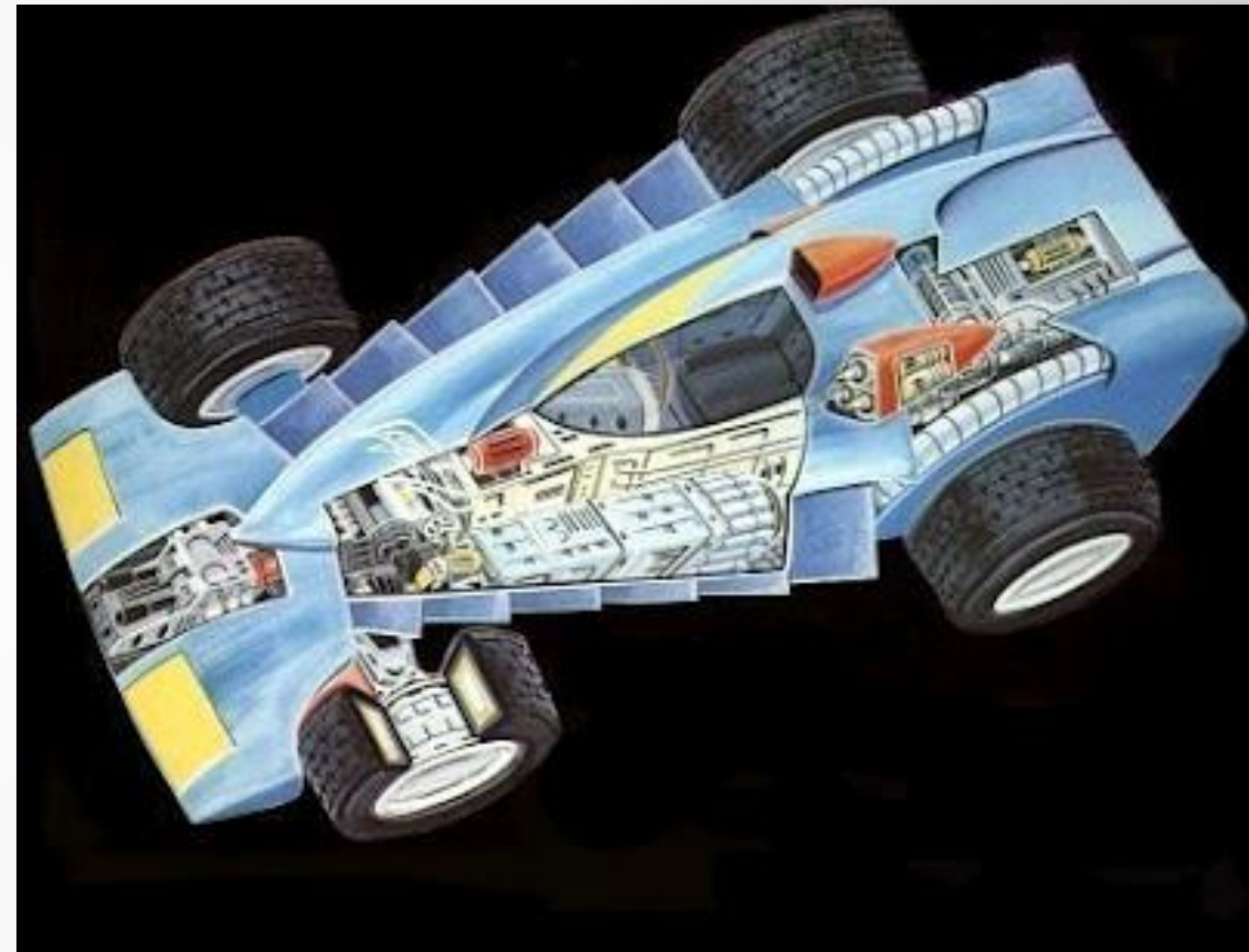
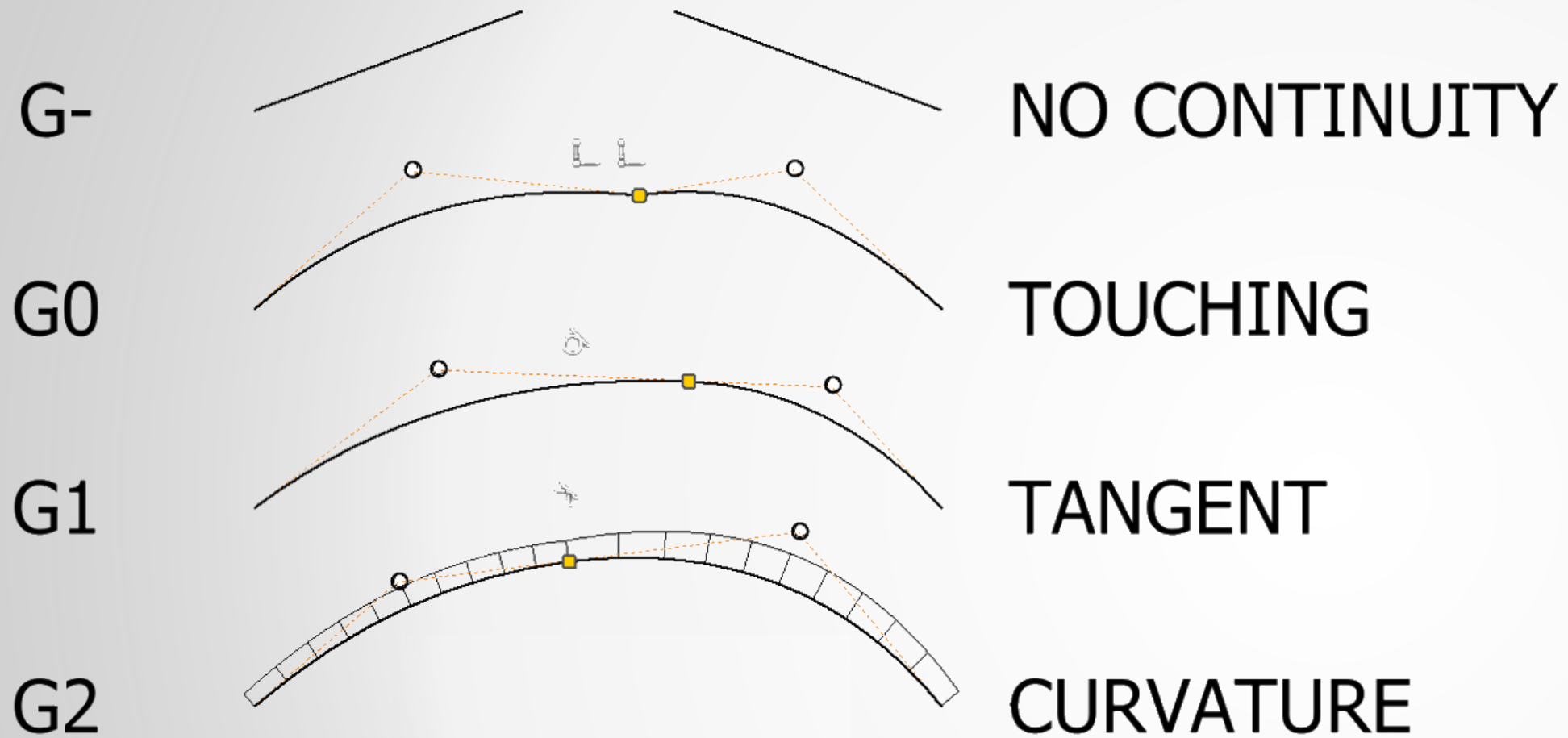
2D Curvature Continuity



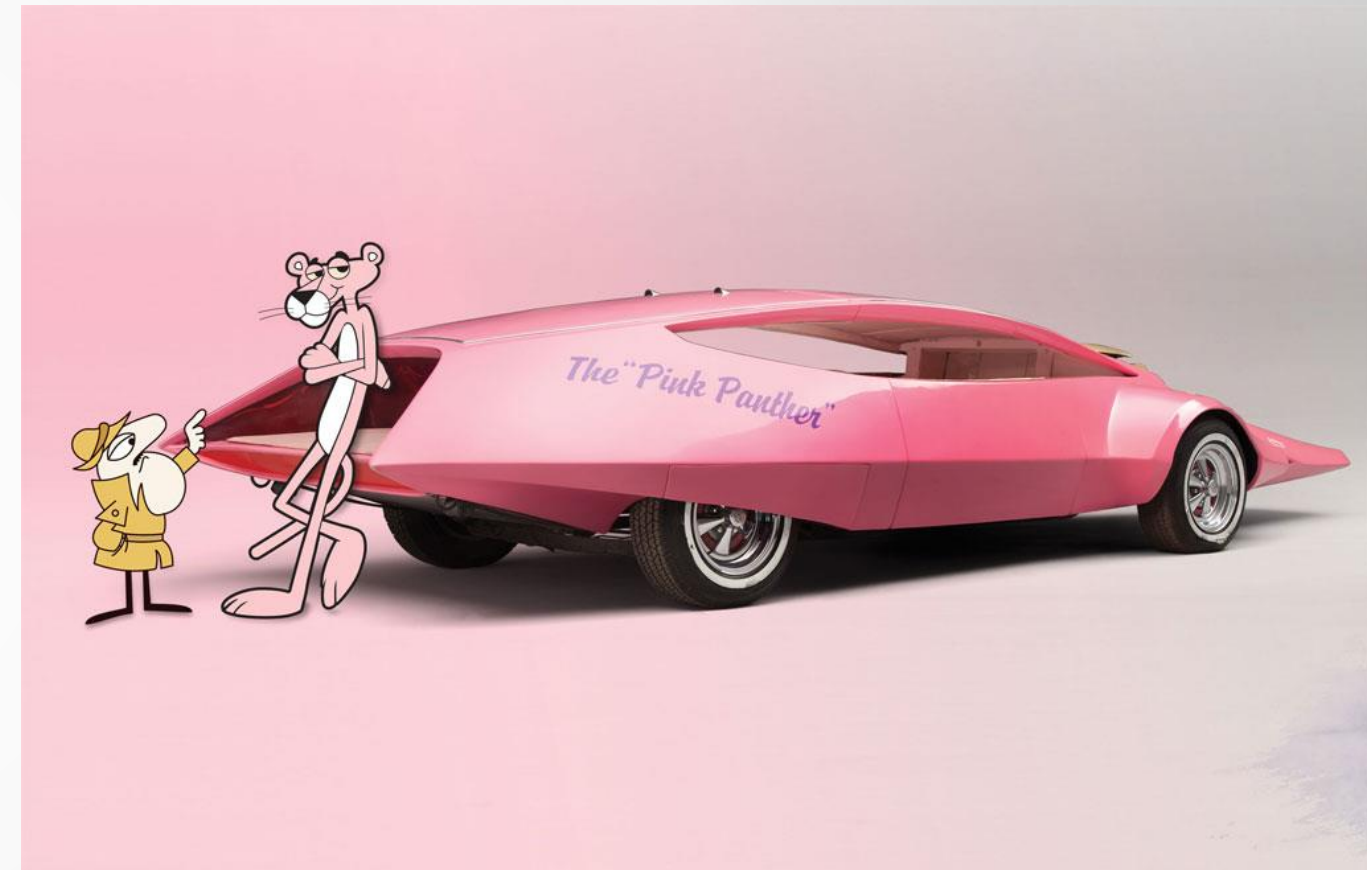
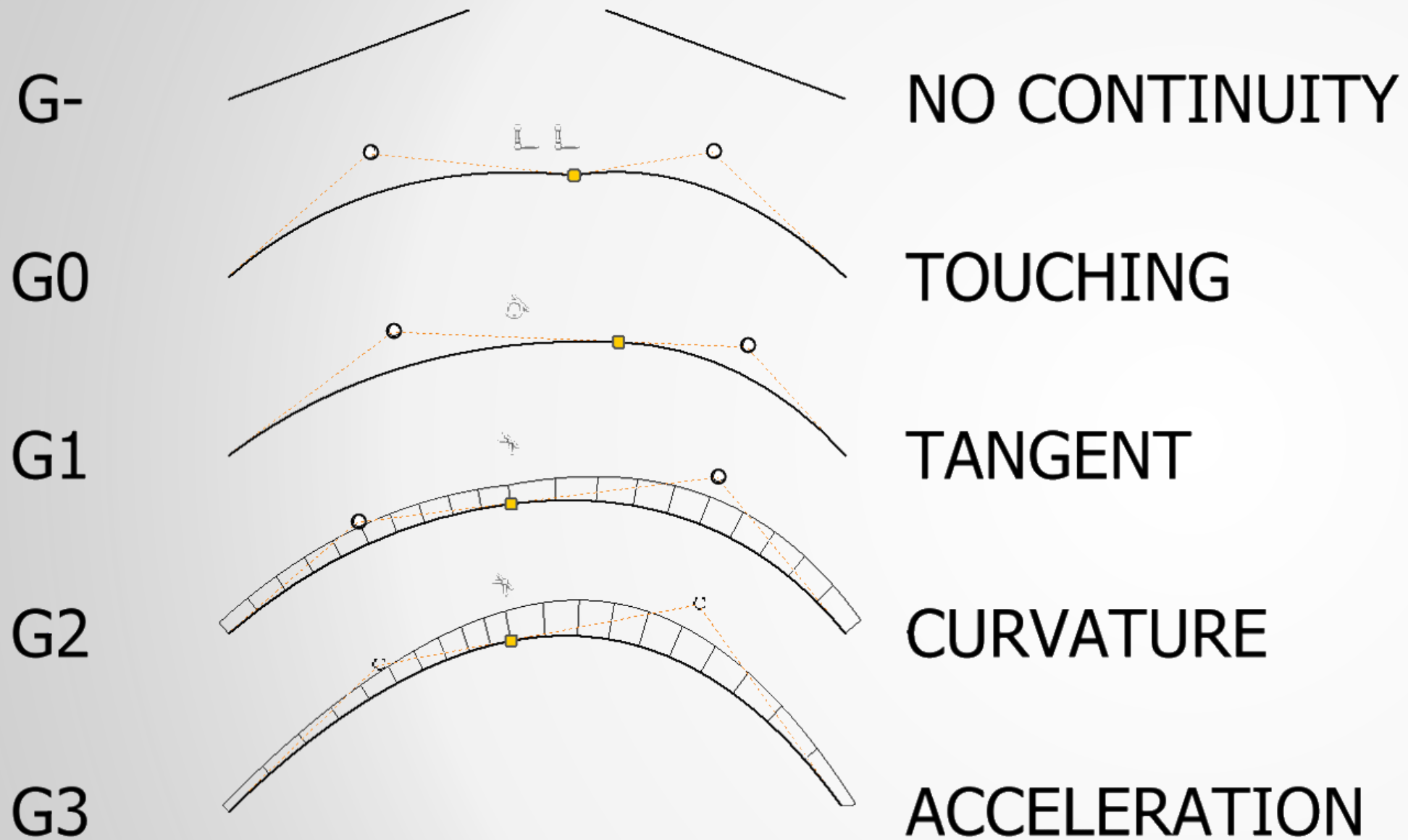
2D Curvature Continuity



2D Curvature Continuity



2D Curvature Continuity

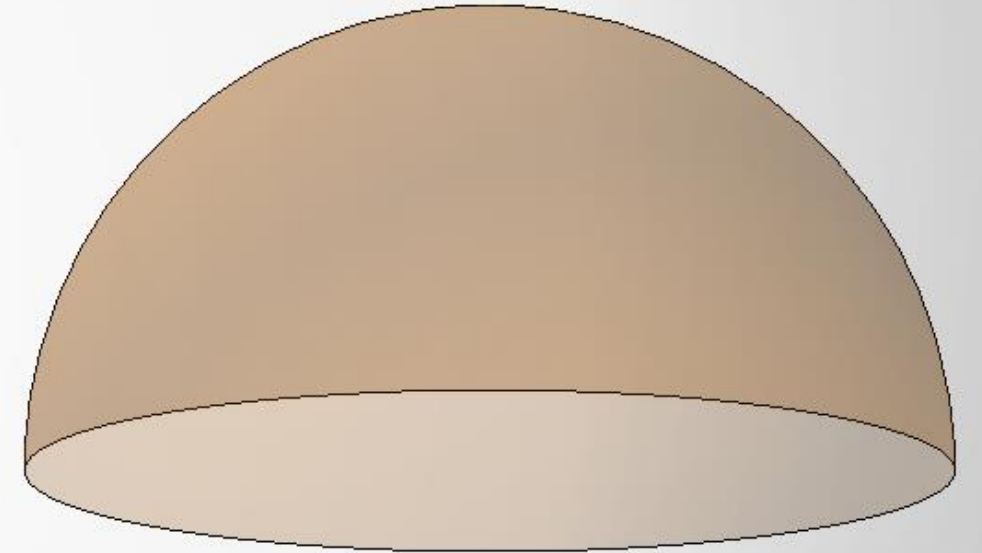
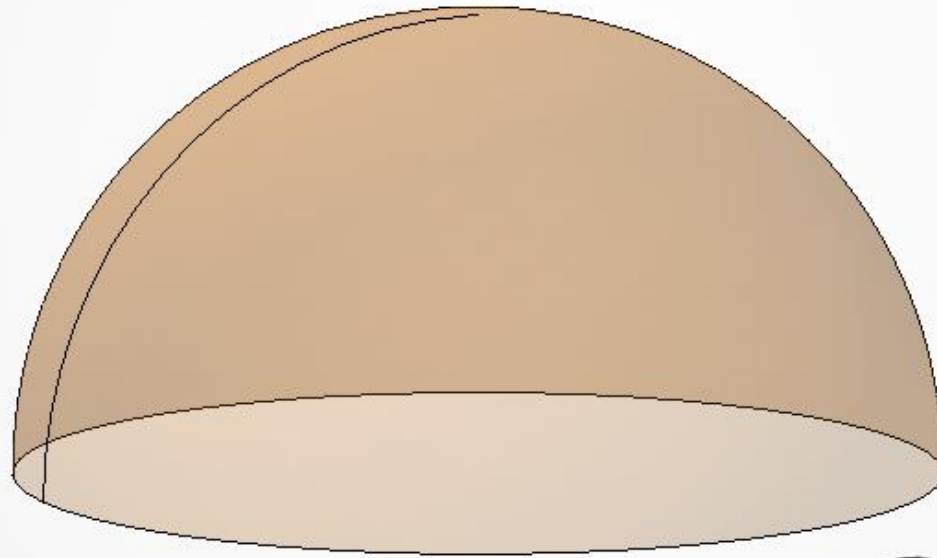
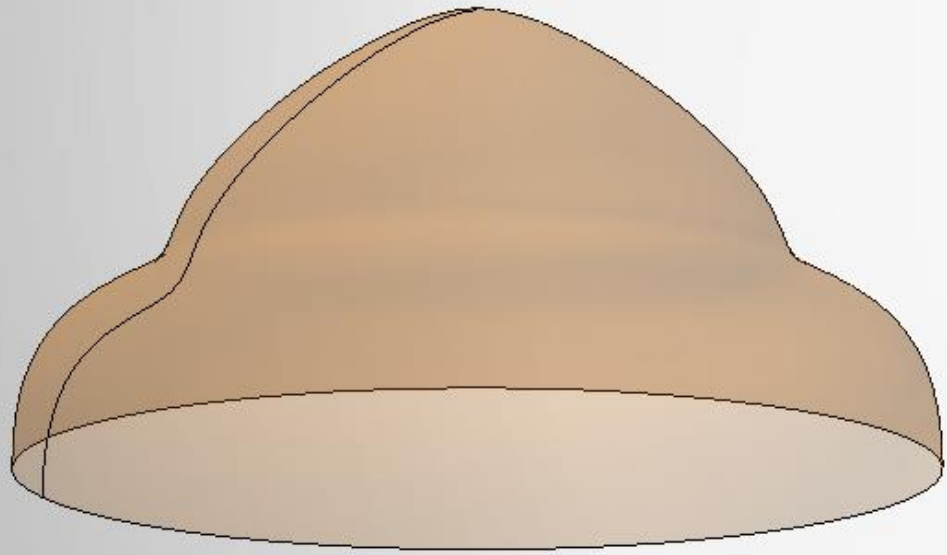


3D Curvature Continuity



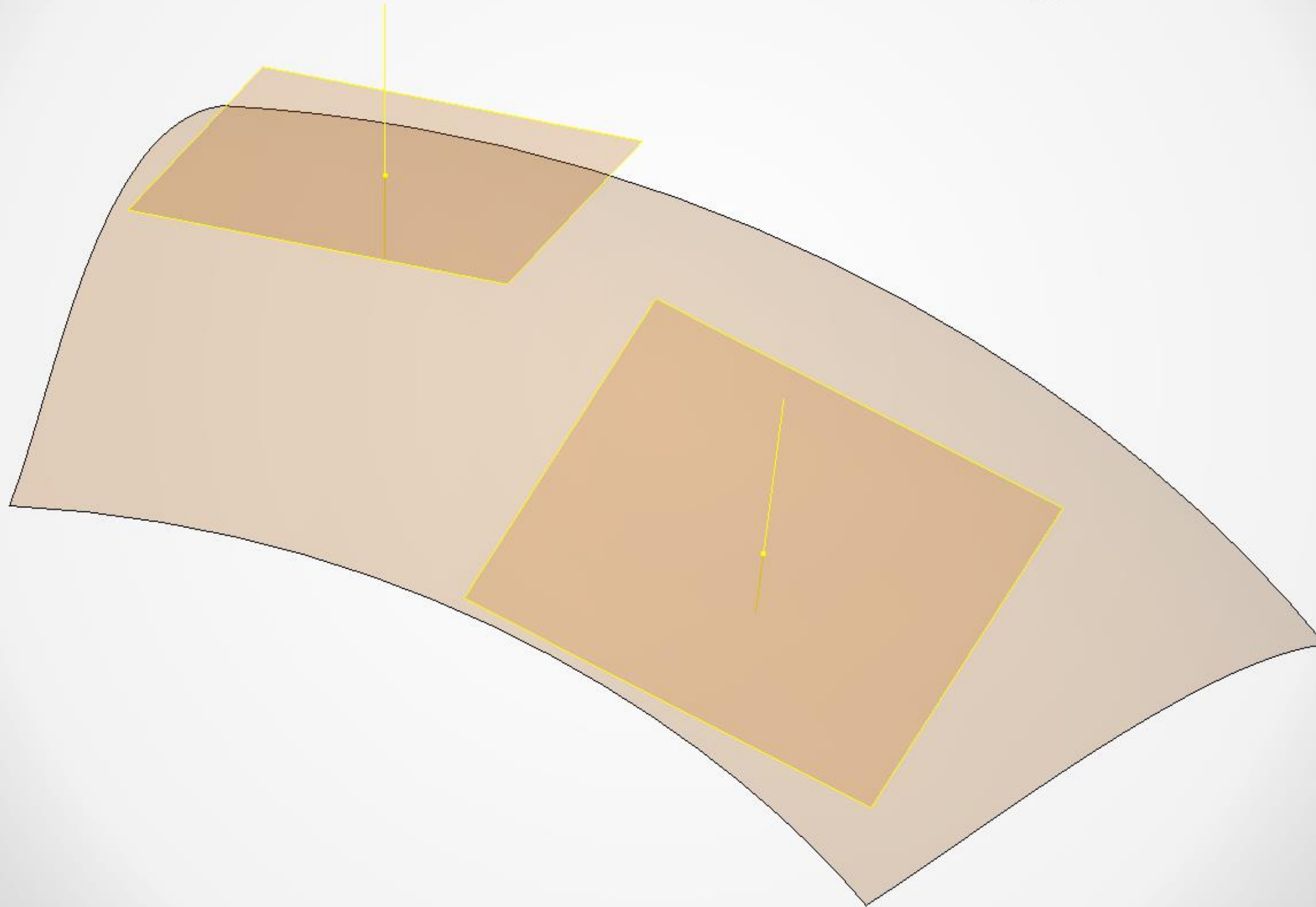
Geometry V's topology

SAME TOPOLOGY

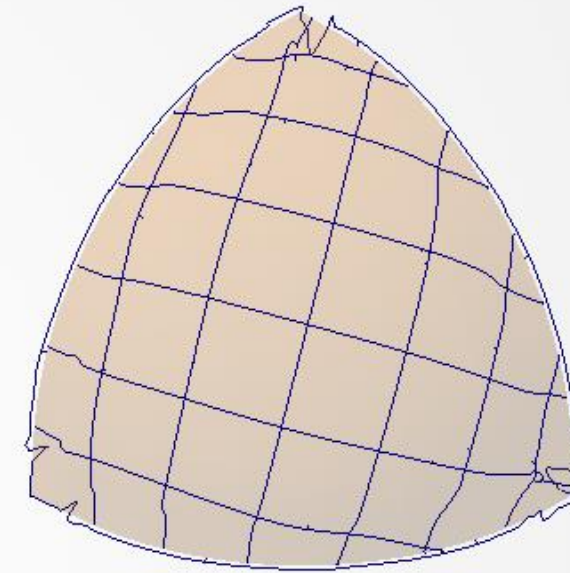
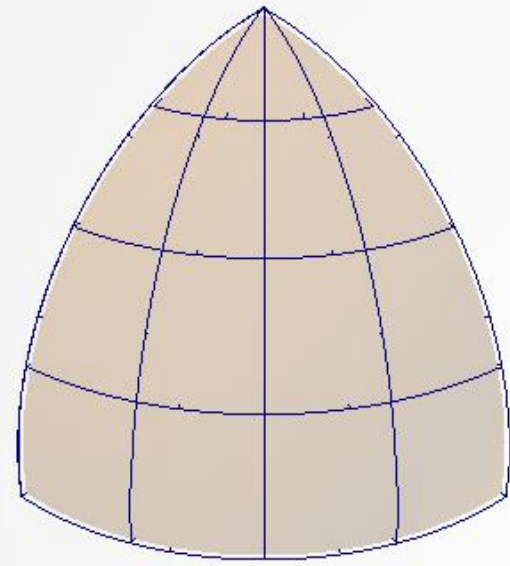


SAME GEOMETRY

SURFACE NORMALS



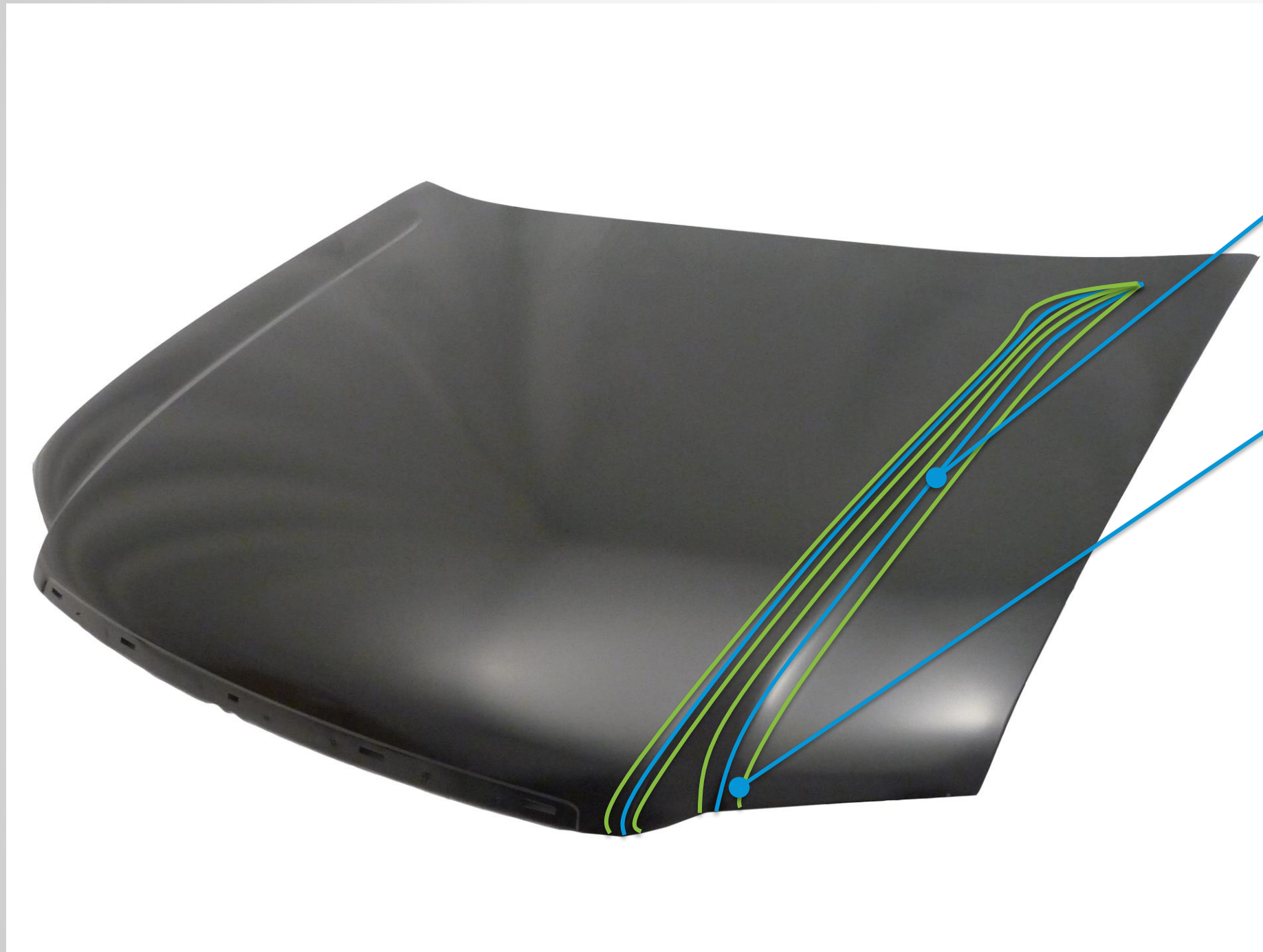
Isoparms



ISOPARMS

Patch layout

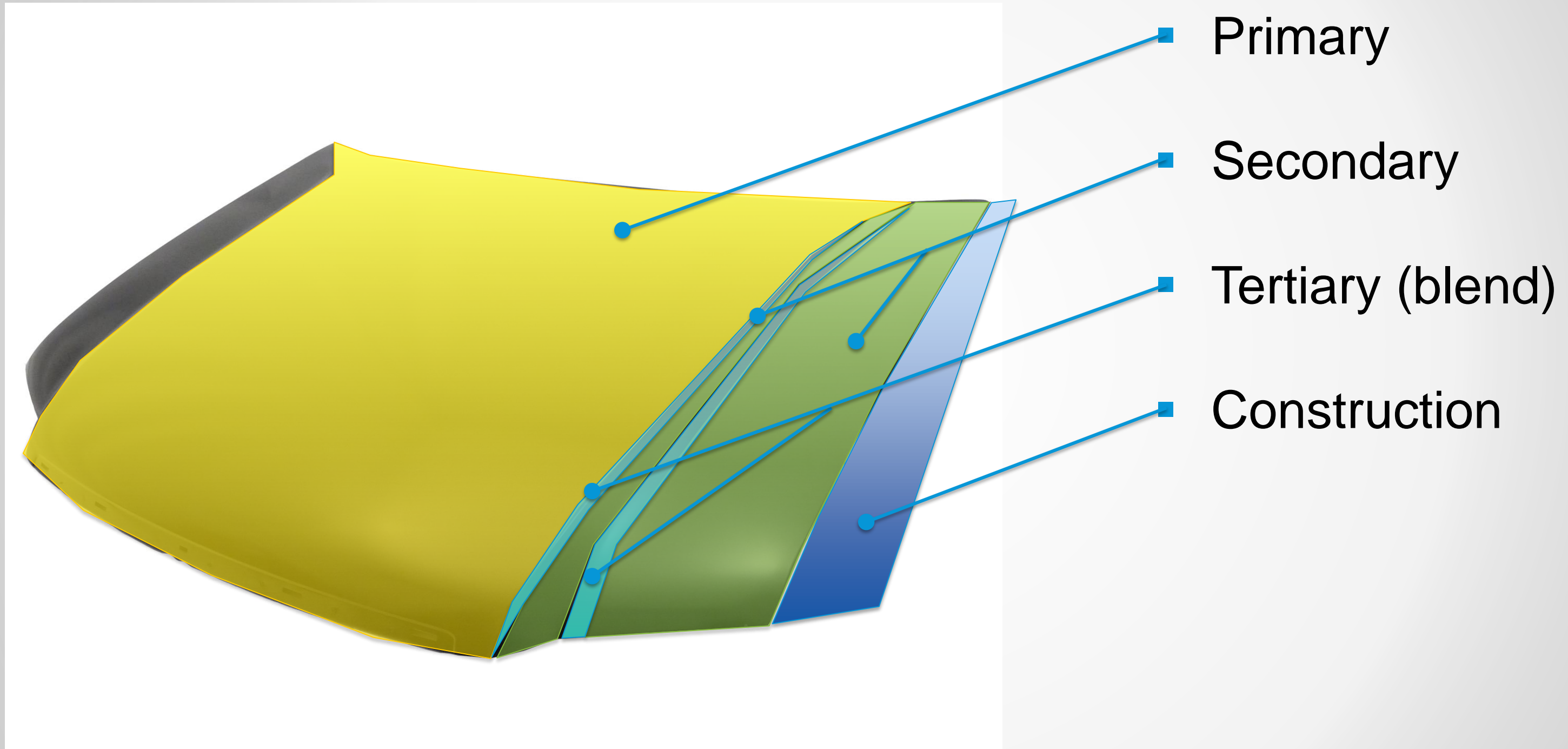
Theoretical sharp edges



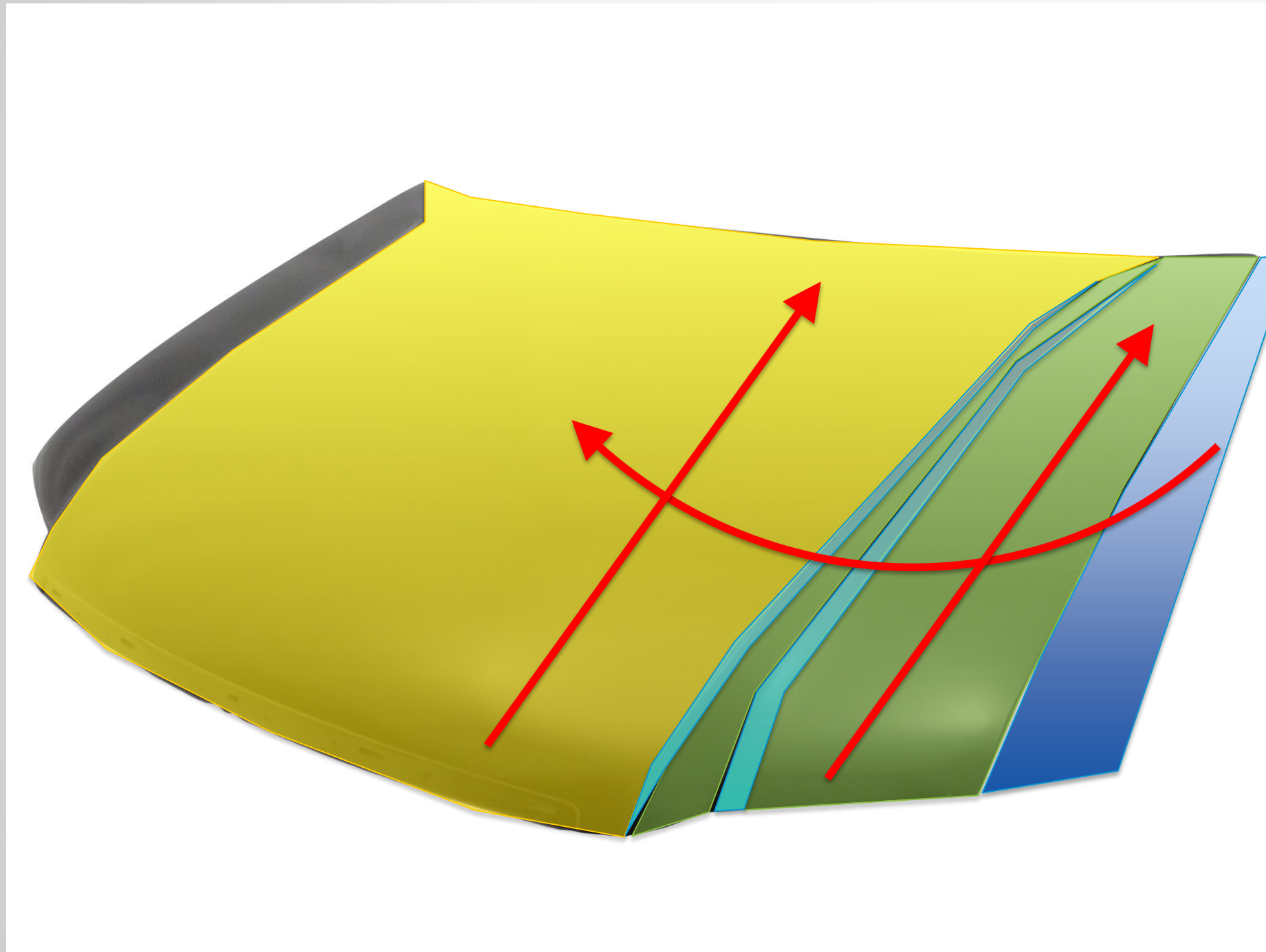
Where edges would meet

Where Blends start

Patch layout



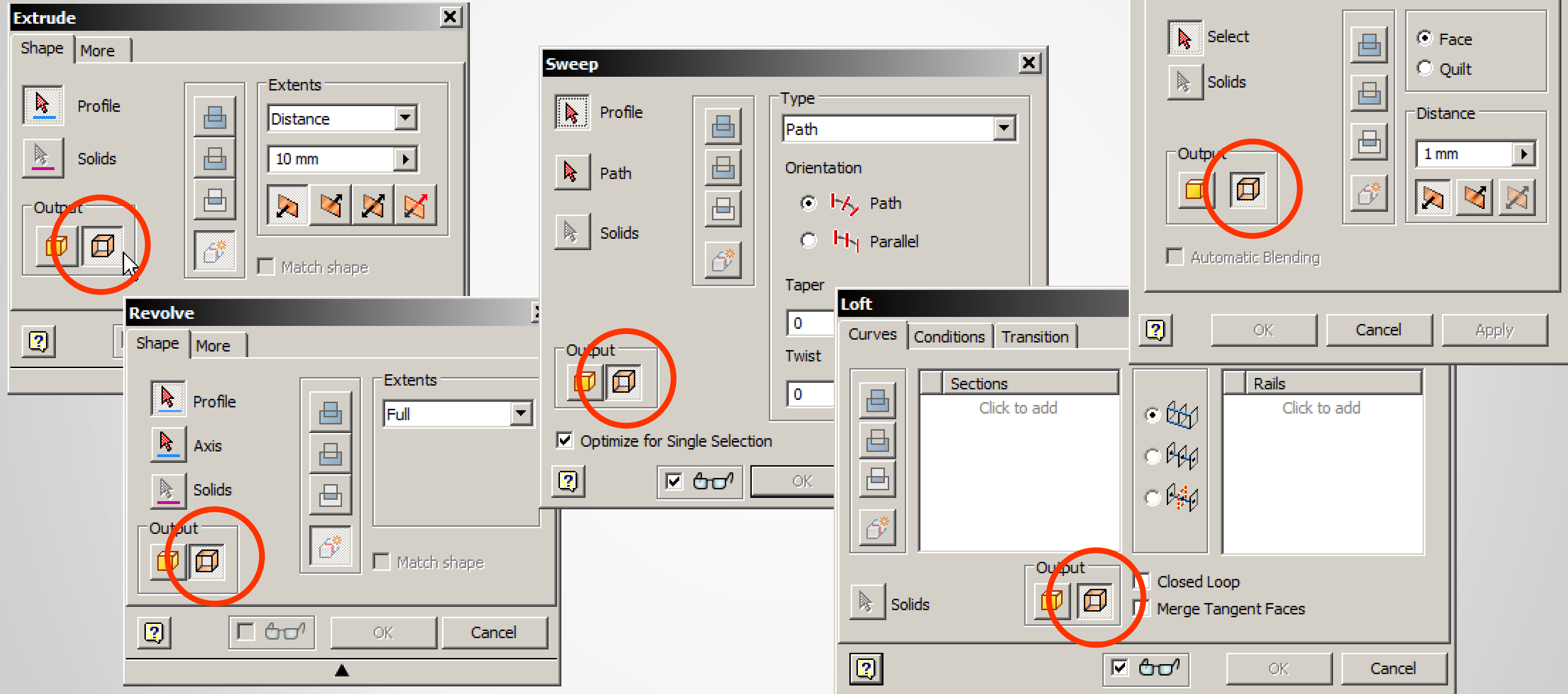
Flow



- Keep your Lofts flowing in the same direction

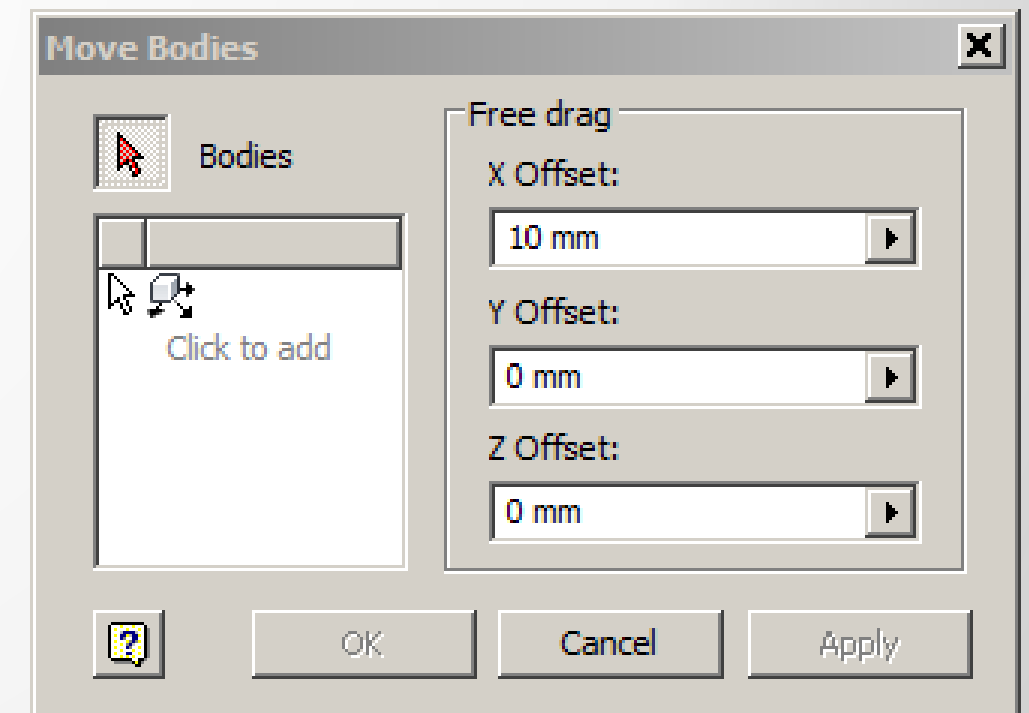
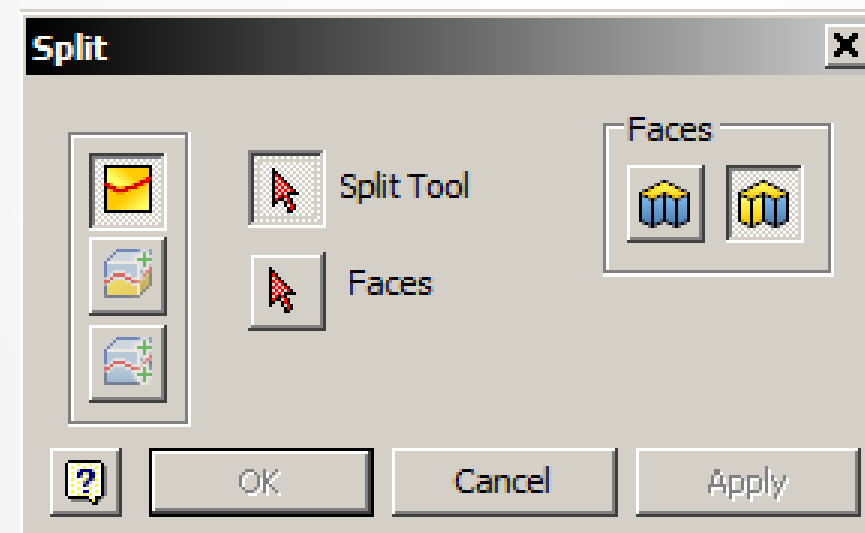
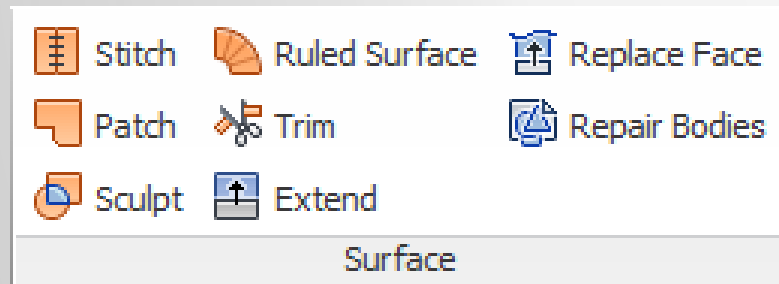
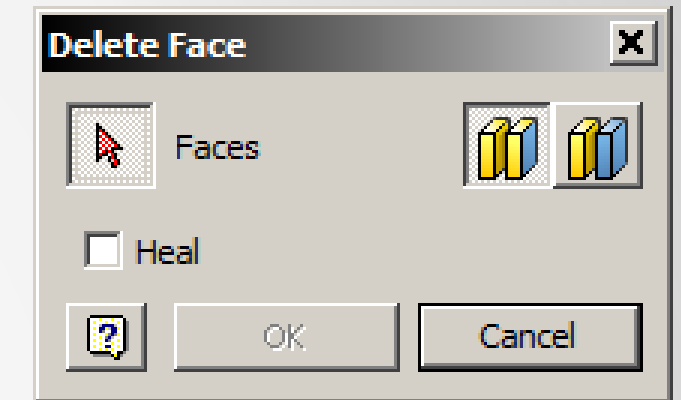
Creating surfaces

How do I create surfaces?

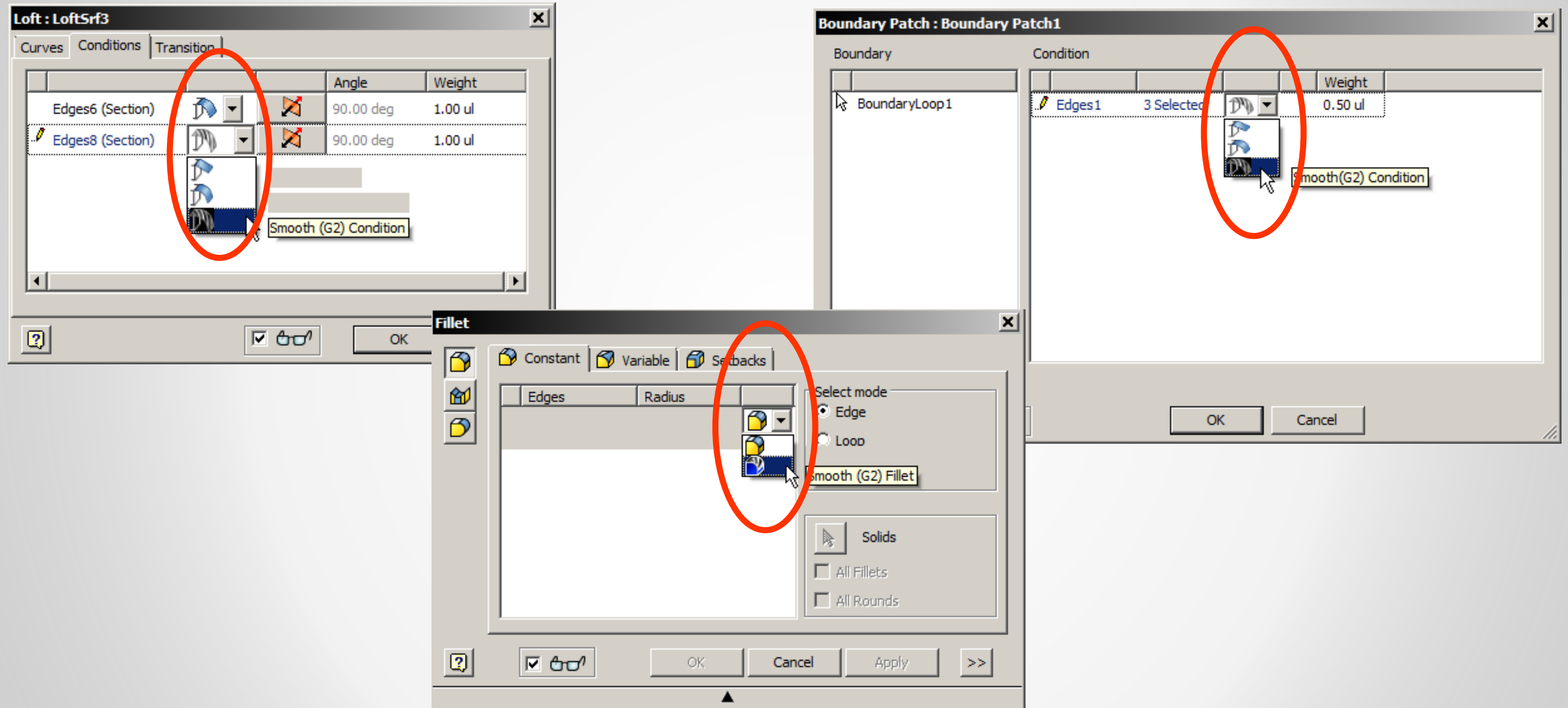


How do I edit surfaces?

- Trim = Trim surface
- Split = Split face tool
- Copy = Thicken/Offset tool
- Move = Move body
- Extend = Make the surface bigger
- Rule surface = Create a perpendicular or tangent surface from an edge.
- Delete



Surface continuity controls



2D and 3D Splines

- 2D Interpolation Splines
- 2D CV Splines
- 3D Splines
- Projected Geometry

Let's try it...

Surface Analysis

- Chrome
- Zebra stripes
- Curvature

Let's try it...

Surfacing Gotchas

- High Curvature
- Near Tangency
- Sliver Faces
- Degradation

Let's try it...

Surfaces to solids

- Thicken
- Sculpt
- Stitch

Let's try it...

Examples

- Spoon
- Knife
- Mouse

Let's try it...

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