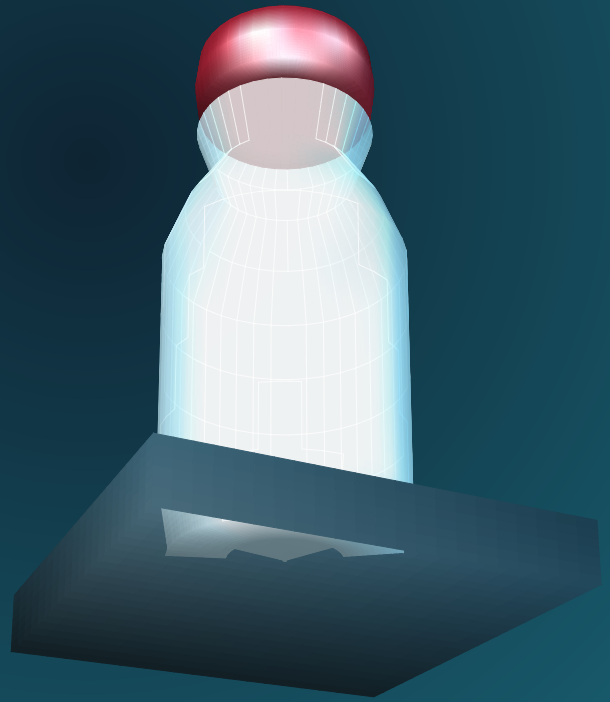
F7 · 3-D

Line 2 in three dimensions

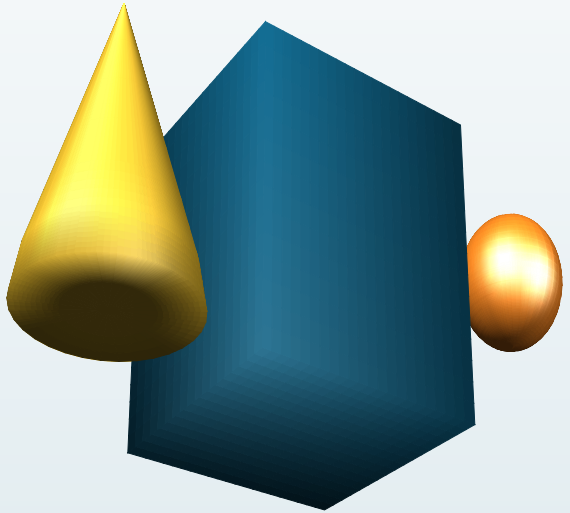
Equipment, airflow and data
Training deck for Building F7 operators



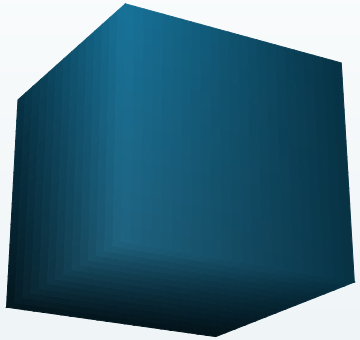
HALVORSEN-VIRE BIOLOGICS · CORVENNE STERILE OPERATIONS

Agenda

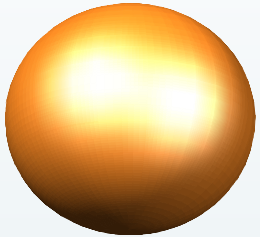
- Why we draw equipment in 3-D
  - Same artwork in SOPs, deck and Draw drawings
- Eight native primitives and three shading modes
  - Flat, Gouraud and Phong compared
- Materials, textures and light
- Extrusion and rotation objects from 2-D shapes and text
  - Convert → To 3D and Convert → To 3D Rotation Object
- Extruded custom shapes and Fontwork
- Data in 3-D: charts and tables
- Process map and summary
    - Backup slide is hidden and must not print



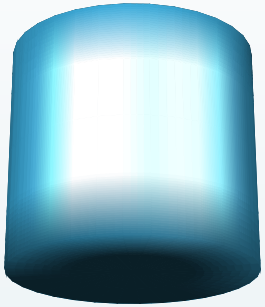
Eight native 3-D primitives



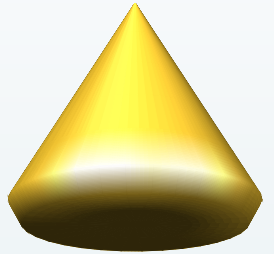
Cube



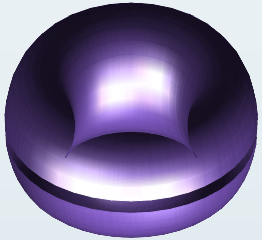
Sphere



Cylinder



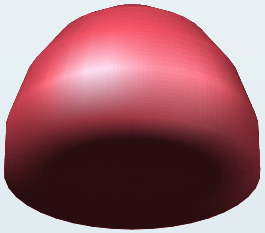
Cone



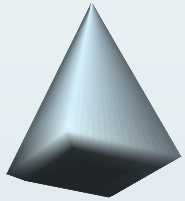
Torus



Shell



Half-sphere



Pyramid

Shading: flat, Gouraud and Phong



Flat

16 × 12 segments, faceted normals



Gouraud (smooth)

Colour interpolated across each facet



Phong

Per-pixel lighting with a sharp specular spot

Materials, textures and light

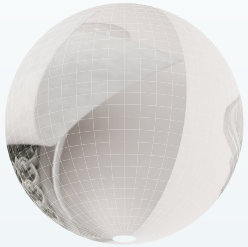


Photo texture on a sphere

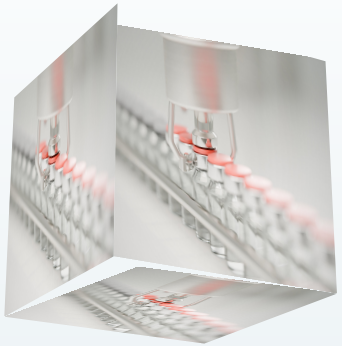
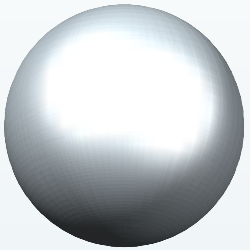
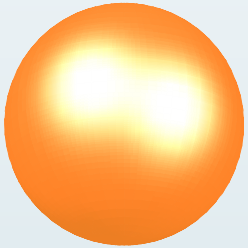


Photo texture on a cube



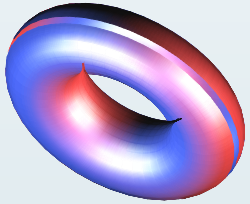
Polished metal (specular 100)



Self-illuminated (emission)

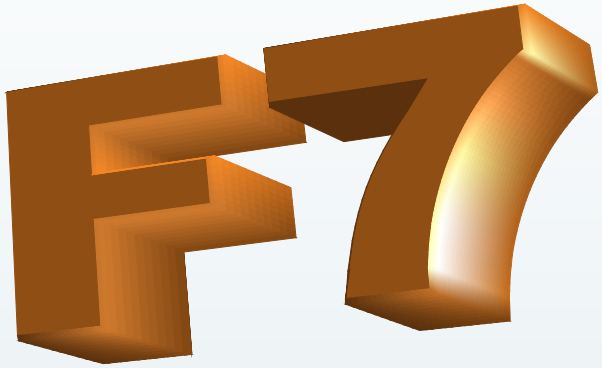


Translucent glass 50 %

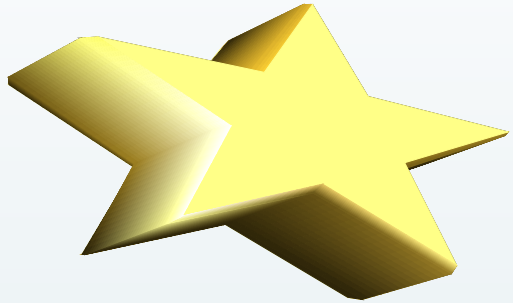


Coloured lights: red + blue

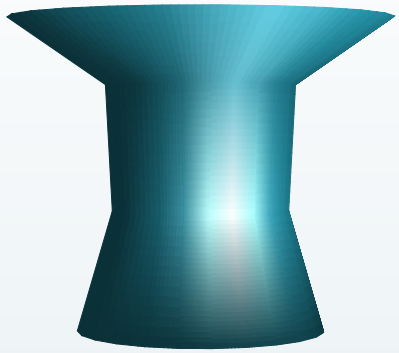
Extrusion and rotation objects from 2-D shapes and text



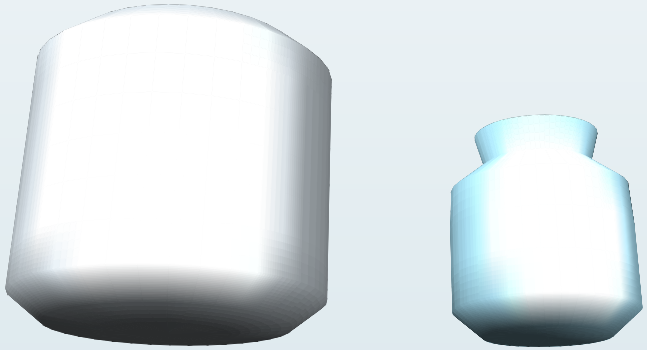
Text → Convert → To 3D (extruded, bevel 8 %)

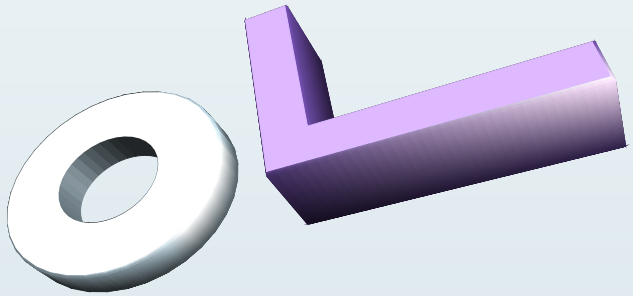


2-D star → extrusion object (depth 9 mm, bevel 15 %)



2-D profile → Convert → To 3D Rotation Object

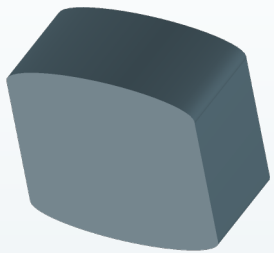




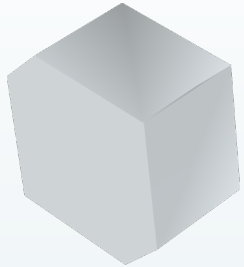
Manual lathe: tank with dished heads and a vial.

Manual extrusion: flange with a hole (two polygons) and an L-bracket.

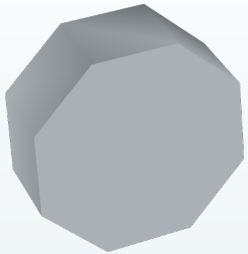
Extruded custom shapes and Fontwork



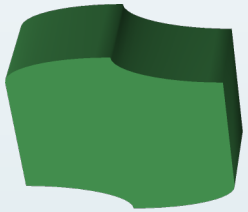
Tank — parallel



Cube preset — perspective



Metal, specular 90



Light from below

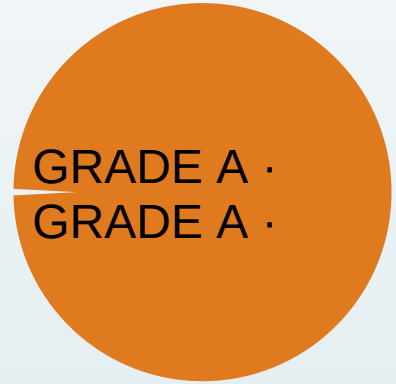


Deep, flat shading



Skewed parallel

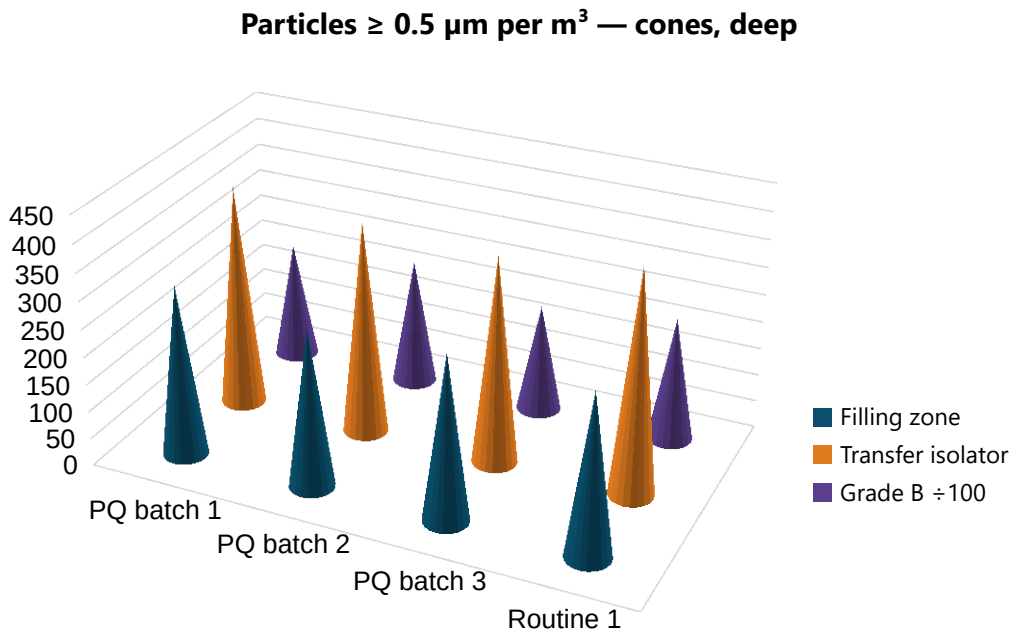






Fontwork: wave (metal), circle-pour and slant-up, all with 3-D extrusion

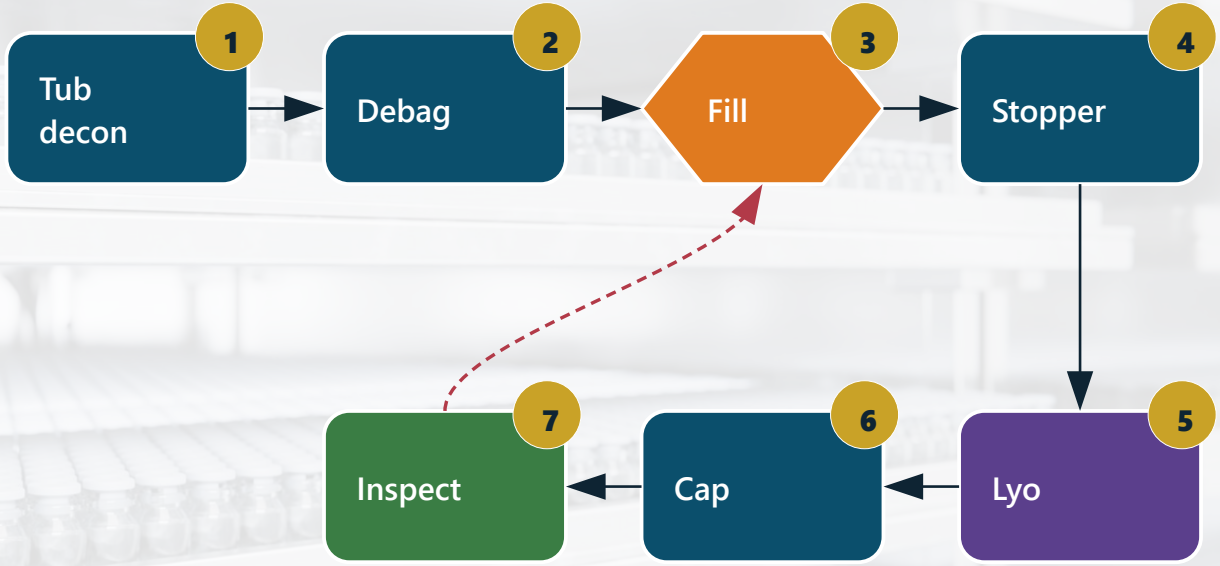
Data in three dimensions



Test	Batch 1	Batch 2	Batch 3
Media fill units	11 520	11 520	11 520
Positives	0	0	0
Fill-weight Cpk	1.74	1.69	1.71
Reject rate	0.58 %	0.66 %	0.61 %
Shelf ΔT (K)	0.8	0.9	0.7
Verdict	**Released for routine manufacture**		

Native Impress table: header fill, banding, white grid and a merged verdict row.

Process map



Groups: step box + numbered badge. Connectors glue to the box edges; the dashed curve is the re-inspection loop.

Summary

- Line 2 released for routine manufacture
- 34 560 media-filled units, zero positives
- Same 3-D artwork reused in SOPs and drawings
- *Questions: validation.f7@example.invalid*

