DPW-VI: Baseline Grid Families

Name	WB	WBNP	Δy_1
Tiny (T)	~20	25-30	0.001478"
Coarse (C)	~30	40-45	0.001285"
Medium (M)	~45	60-70	0.001118"
Fine (F)	~70	85-100	0.000972"
Extra Fine (X)	~100	130-150	0.000845"
Ultra Fine (U)	~150	190-225	0.000735"

Nominal Size of Grid System in M-DOF

At Least 4 Sequential Mesh Levels & Bias Towards Finest

DPW-VI: Gridding Guidelines (1/2)

- **Tiny Grid**
  - Viscous Wall Spacing: $Y^+ \sim 1.0 \rightarrow \Delta y_1 = 0.001478"$
  - At Least 2 Constantly-Spaced Cells at Viscous Walls, $\Delta y_2 = \Delta y_1$
  - Growth Rates < 1.2X Normal to Viscous Walls
  - Wing Spanwise Spacing < 0.1%*Semispan at Root, Engine & Tip
  - WNP Chordwise Spacing < 0.1%*C (local chord) at LE & TE
  - Wing & Nacelle TE Base >> 8 Cells [Pylon TE is Sharp]
  - Spacing Near Fuselage Nose & Afterbody < 1%*Cref
- **Grow Next-Finer Grid in Family by ~ 1.5X in Size**
  - Scale Dimensions in All Three Computational Directions by ~ 1.15X
  - Grid Spacings Reduce by 0.87=(1/1.15) per Mesh Level
    - 0.1% in Tiny → [T,C,M,F,X,U] = [0.100, 0.087, 0.076, 0.066, 0.057, 0.050]%

DPW-VI: Gridding Guidelines (2/2)

- **WB Grids Consistent with Those within WBNP Systems**
  - Helps Minimize Deltas due to Grid → Better NP-Deltas
- **WBNP Grid Sizes ~ 1.3X-1.5X WB Grid Sizes**
  - Pick Factor, Then Keep Constant Throughout Grid Family
- **Farfield Boundary > 100*Semispans**
  - Note: This is Farther than before, which was 100*Crefs
- **Miscellaneous Notes:**
  - Try to be Multigrid Friendly on Structured Meshes
  - Store Grid Coordinates in 64-bit Precision
  - If Storing Grids in Plot3D Format, Keep Zones < 33M Nodes
  - Itemize Surface Elements by Components [W, B, N, P, Sym, Far]
  - Itemize Element Count for Unstructured Meshes
    - Volume: Tetrahedra, Prisms, Pyramids, Hexahedra
    - Surface: Triangles, Quads