

Resolving Imprinting and Merging Problems in CUBIT

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Imprinting

Produces identical and coincident topology between volumes that abut.

Merging

Compresses identical and coincident topology into a single representation that is shared.

Causes of Imprinting and Merging Problems

- CAD Translation – translating from one format to another introduces problems.
- Tolerance Mis-match – going from CAD package with loose tolerance to CUBIT's fine tolerance can cause ambiguities.
- User Modeling Errors – user didn't create parts correctly, parts don't line up.

Approach

1. Imprint & Merge
2. Find Overlapping Surfaces (*find overlap volume <id_range>*)
3. Turn on labels for curves (*label curve on*)
4. Turn on vertex visibility (*vertex visibility on|off*)
5. Diagnose problem

Solutions

- Tweaking -- moving, offsetting or replacing surfaces or curves, while extending the adjoining surfaces to fill the resulting gaps. This is useful for eliminating gaps between volumes.

Tweak {Curve|Surface} <id_list> Target Surface <id_list>

- Tolerant Imprinting – imprinting that uses a tolerance (merge tolerance)

Imprint Tolerant {Body|Volume} <range>

Imprint Tolerant Surface <id> [with] Curve <range>

Imprint Tolerant Surface <id> <id> [with] Curve <id_range>

- Force Merging – geometry must have like topology (same number curves and vertices)

Merge {Surface|Curve|Vertex} <id> with {Surface|Curve|Vertex} Force

- Adjusting Merge Tolerance

Merge Tolerance <val=5.0e-4>

- Local Imprinting

Imprint {Volume|Body} <range> [with] Curve <range> [keep]

Imprint {Volume|Body} <range> [with] Vertex <range> [keep]

Imprint {Volume|Body} <range> [with] Position <coords> [Position <coords> ...] [keep]

Imprint Surface <range> [with] Curve <range> [keep]