

Supplemental for the paper “Robust topological construction of all-hexahedral boundary layer meshes”

Reberol M., Verhetsel K., Henrotte F., Bommes D., Remacle J.F.

This document contains the results of the all-hexahedral boundary layer meshing technique applied to the 114 models of the MAMBO dataset [1]. The results are compared to extruded all-hexahedral meshes, which are built by imposing a valence of two everywhere in our integer formulation. The input quadrilateral meshes have been generated with [2] (available in Gmsh).

All the hexahedral layers have been generated with the same default parameters. The ideal valences have been computed from the dihedral angles at the boundary edges and the solid angles at the boundary vertices.

In the statistics:

- The quality metric is the Signed Inverse Condition Number (SICN). It is similar to the scaled jacobian ($Q \leq 0$ for invalid quads/hexahedra (e.g. flat or inverted), $Q=1$ for squares/cubes). $qMin$, $qAvg$, $qMed$ are respectively the minimum, average and median of the element values.
- $\# ngl\ corners$ is the number *non grid-like* corners, which are boundary vertices where there is no local boundary hexahedral configuration matching the ideal valences.
- *time topo* is the time spent finding the mesh topology by solving the integer problem, and *time geom* is the time spent untangling/smoothing the mesh geometry. Both correspond to the execution on a single thread of a laptop 2.8 GHz CPU.
- *energy* is the sum of squared differences between the final edge valences and the ideal ones (see formula in article).
- $\#probs$ is the number of independent integer problems built by the domain decomposition and solved by the search-and-bound.
- $\#irref\ configs$ is the number of boundary hexahedral configurations where the valences are different from the ideal ones (red hexahedra in the figures).

In the figures:

- *light grey* color is used for extruded hexahedra (i.e. one face on the boundary).
- *blue* color is used for non-extruded hexahedra which match the ideal valences.
- *red* color is used for hexahedra in irregular configurations, where the valences are different from ideal ones (i.e. found by the integer solver).

Remarks:

- The geometry of the hexahedra is determined by the untangler/smooth[3] with the regular cube as target shape. Thus the boundary layer thickness is mainly given by the size of the boundary edges, which are fixed.
- This leads to slightly bumpy interior surfaces (e.g. B0) because the quad edge sizes are naturally different depending on the quad-valence (e.g. smaller at irregular vertex of valence 3).
- When the volume thickness is smaller than the boundary quad sizes, the layers of opposite faces overlap because there is currently no mechanism to avoid self-intersections (models B14, B15, B23). This should be improved in the near future.
- The implementation of the integer solver (which is applied to the sub-domains) is available in this supplemental [4]. It also contains the experimental proof of Proposition 2.
- The complete open-source implementation of our technique is available in an experimental branch of Gmsh [5].

References:

- [1] MAMBO dataset: <https://gitlab.com/franck.ledoux/mambo>
- [2] Reberol, M., Georgiadis, C., & Remacle, J. F. (2021). Quasi-structured quadrilateral meshing in Gmsh—a robust pipeline for complex CAD models. arXiv preprint arXiv:2103.04652.
- [3] Garanzha, V., Kaporin, I., Kudryavtseva, L., Protais, F., Ray, N., & Sokolov, D. (2021). Foldover-free maps in 50 lines of code. arXiv preprint arXiv:2102.03069.
- [4] AllHexLayerTopoSolver/ directory (C++ code)
- [5] Gmsh hexbl branch: <https://gitlab.onelab.info/gmsh/gmsh/-/tree/hexbl>

Model: B0

CAD: 14 corners, 21 curves, 9 surfaces, 1 volume

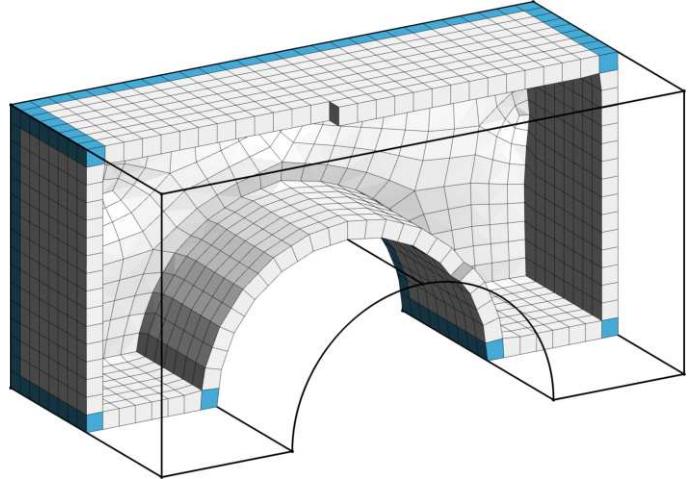
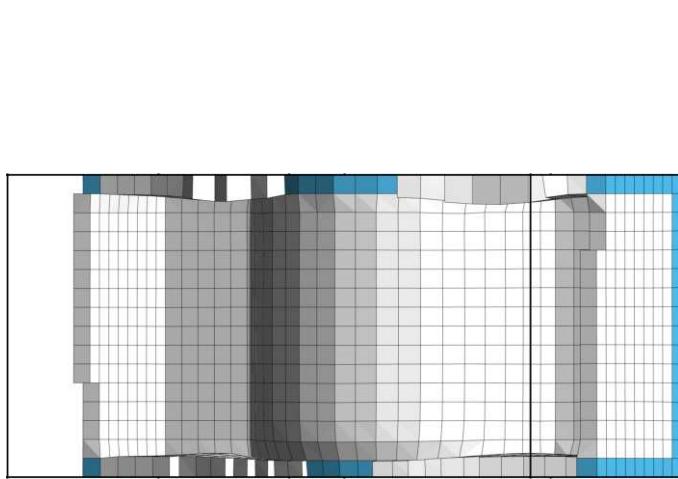
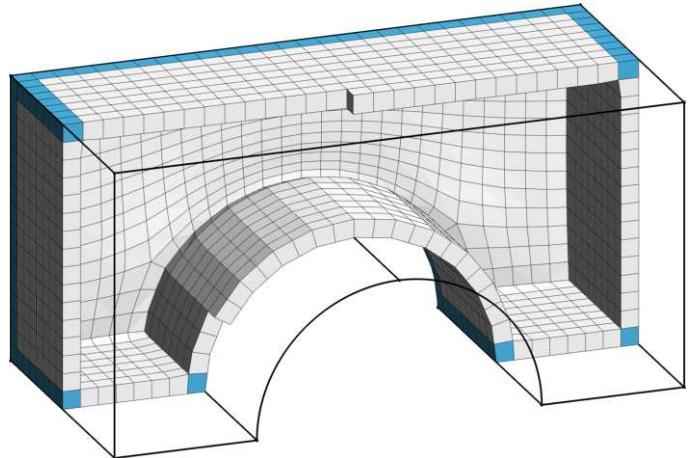
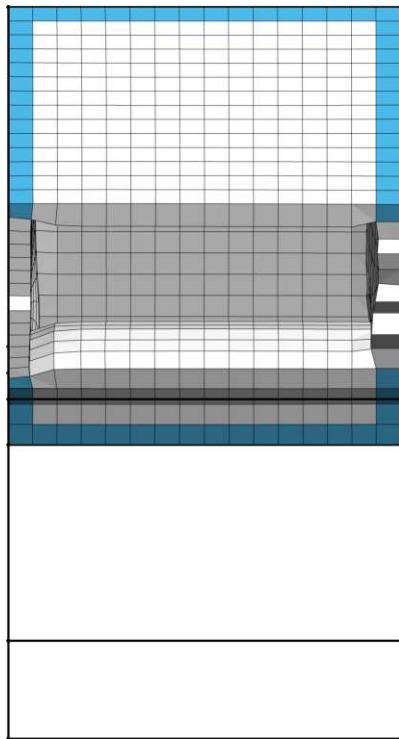
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
754	589	0.713	0.97	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.08341s	4716	2356	145.478	-	-	0.421	0.85	0.90
Ours	0.001233s / 0.136372s	4160	2072	0	0	0	0.738	0.97	0.98

Figures:



Model: B10

CAD: 10 corners, 15 curves, 7 surfaces, 1 volume

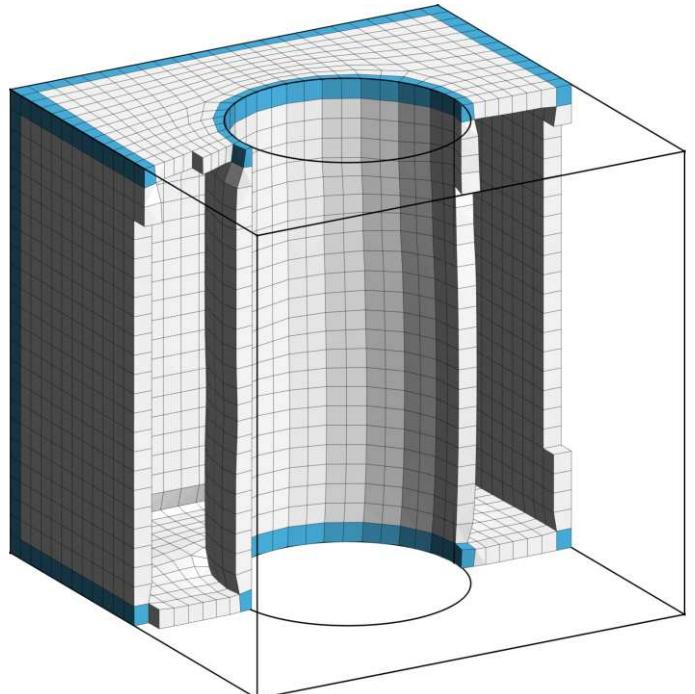
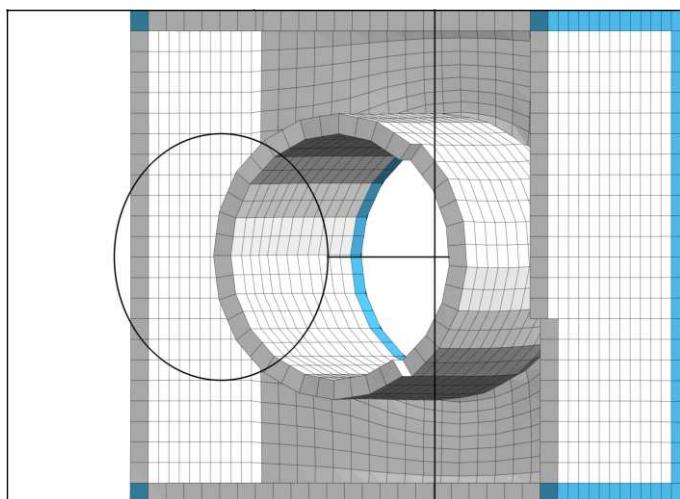
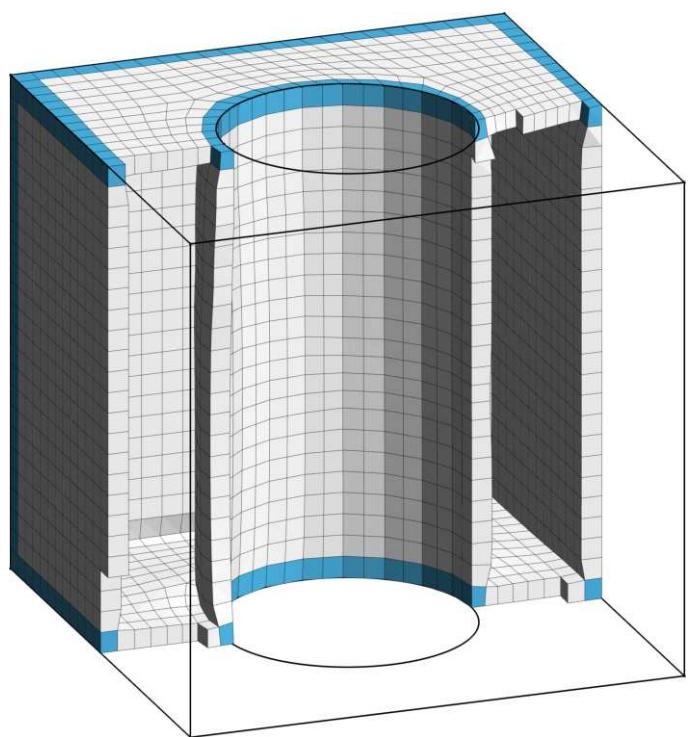
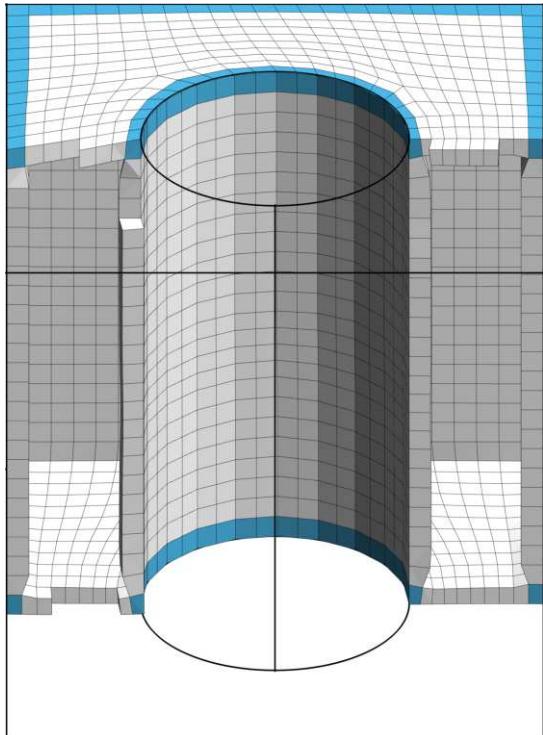
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1283	1095	0.599	0.97	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.4328s	8760	4380	184.066	-	-	0.437	0.89	0.97
Ours	0.00126s / 0.247526s	8048	4020	0	0	0	0.672	0.97	0.99

Figures:



Model: B11

CAD: 4 corners, 6 curves, 4 surfaces, 1 volume

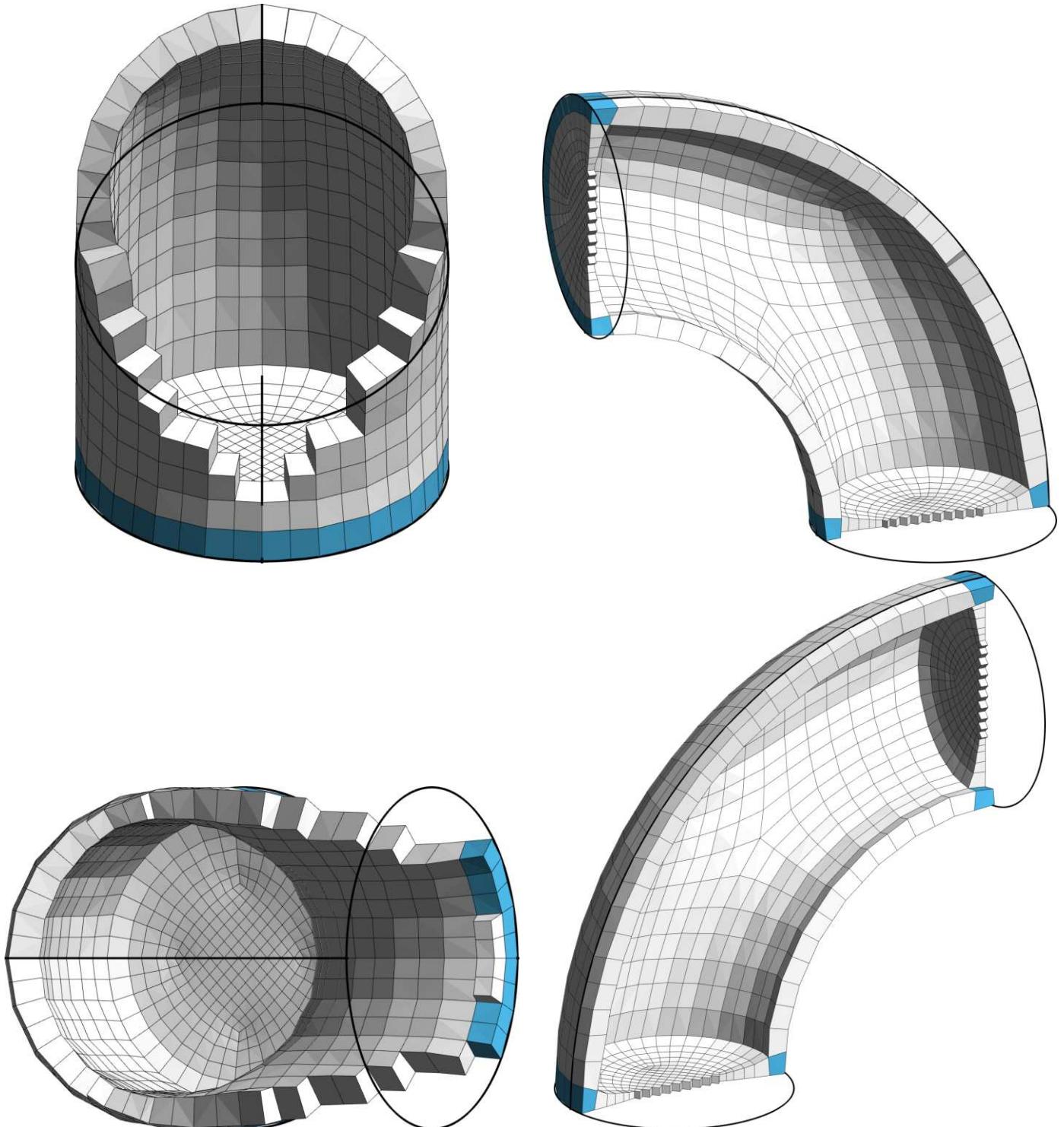
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
462	396	0.727	0.93	0.94	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.242595s	3172	1584	39.6747	-	-	0.651	0.89	0.89
Ours	0.000555s / 0.118442s	3012	1504	0	0	0	0.693	0.91	0.90

Figures:



Model: B12

CAD: 2 corners, 3 curves, 3 surfaces, 1 volume

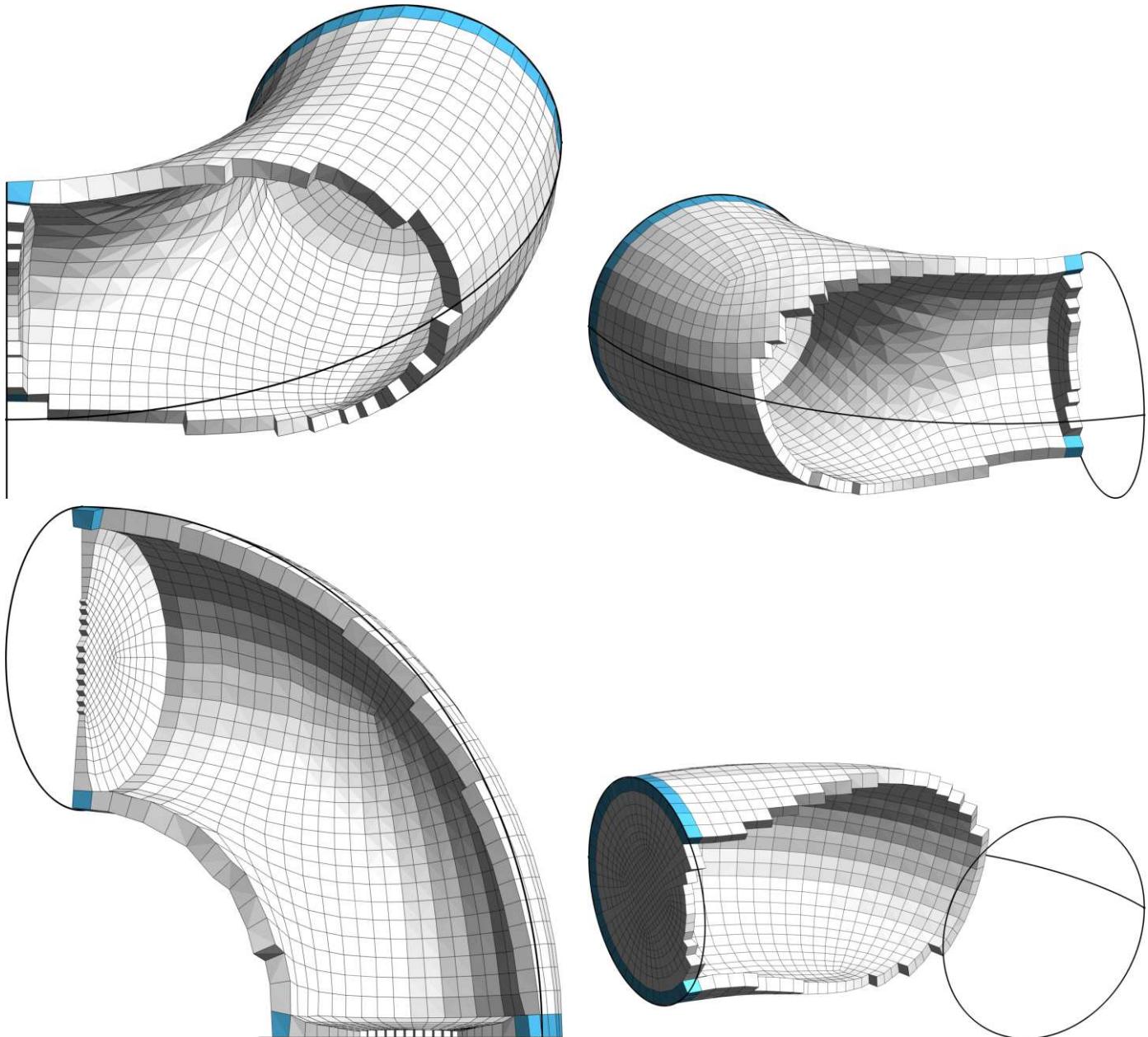
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
671	621	0.732	0.97	0.98	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.356625s	4972	2484	46.7815	-	-	0.632	0.93	0.97
Ours	0.000683s / 0.11214s	4780	2388	0	0	0	0.602	0.96	0.97

Figures:



Model: B13

CAD: 6 corners, 9 curves, 4 surfaces, 1 volume

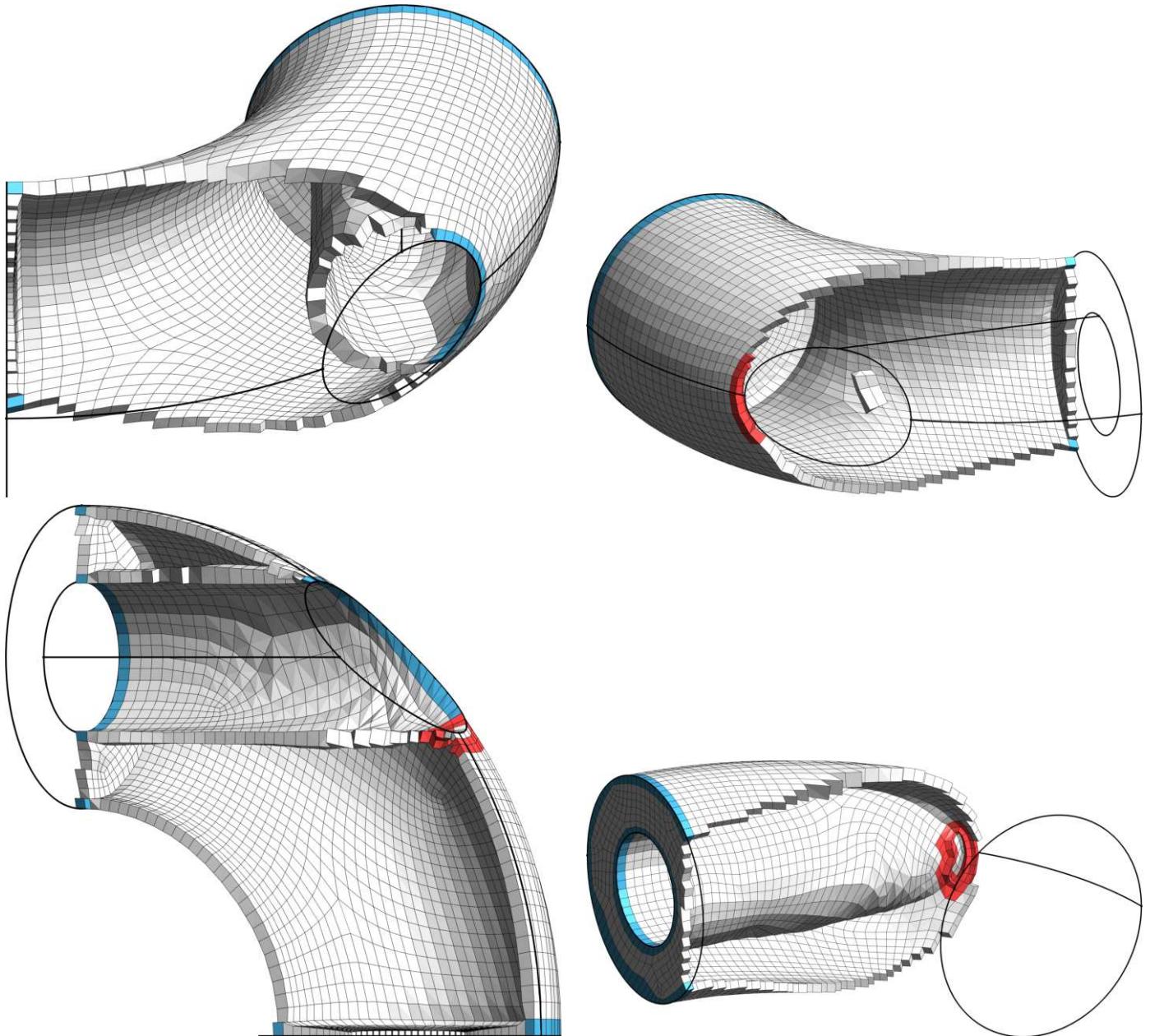
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1620	1494	0.440	0.92	0.95	2

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.58975s	11952	5976	139.837	-	-	0.071	0.89	0.94
Ours	0.087843s / 0.553547s	11498	5750	10.5214	1	10	0.092	0.92	0.95

Figures:



Model: B14

CAD: 2 corners, 3 curves, 3 surfaces, 1 volume

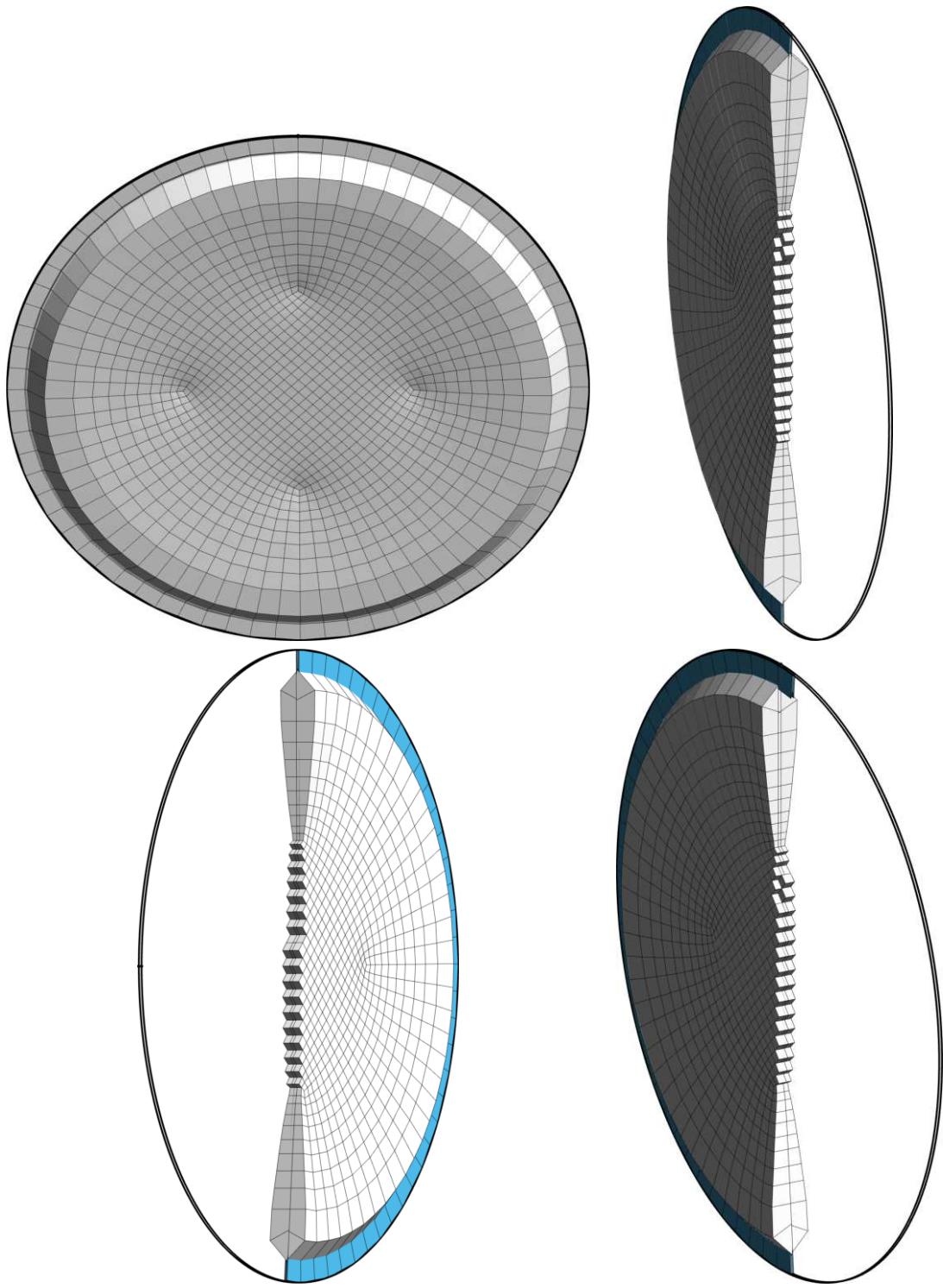
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
740	666	0.056	0.88	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 81.1277s	5332	2664	71.808	-	-	-0.00	0.81	0.99
Ours	0.000832s / 1.16771s	5044	2520	0	0	0	0.060	0.82	0.99

Figures:



Model: B15

CAD: 2 corners, 3 curves, 3 surfaces, 1 volume

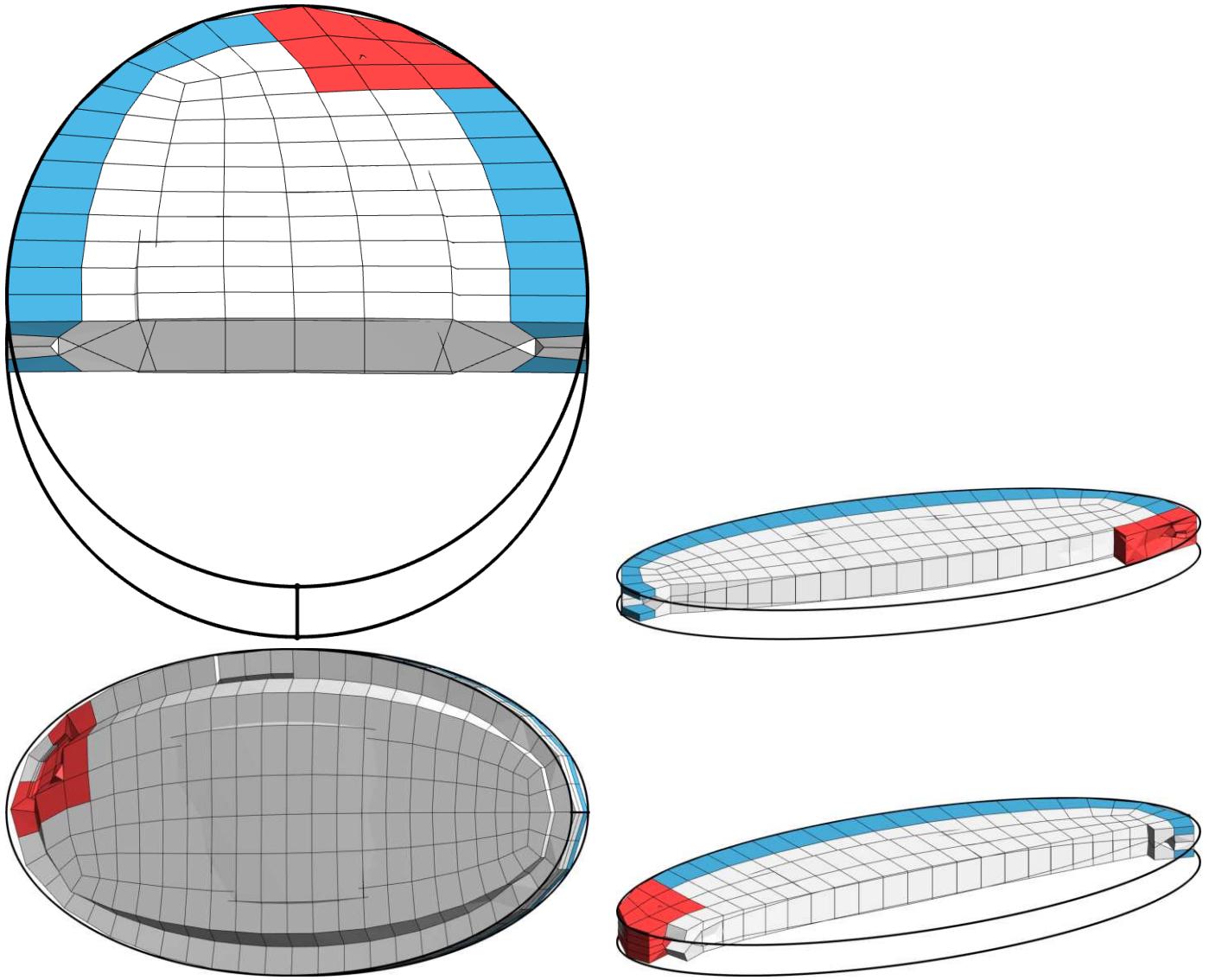
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
196	142	0.450	0.76	0.89	2

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.631499s	1140	568	51.9236	-	-	0.263	0.54	0.37
Ours	0.001534s / 0.207309s	968	484	14.7687	1	10	0.273	0.63	0.53

Figures:



Model: B16

CAD: 8 corners, 12 curves, 6 surfaces, 1 volume

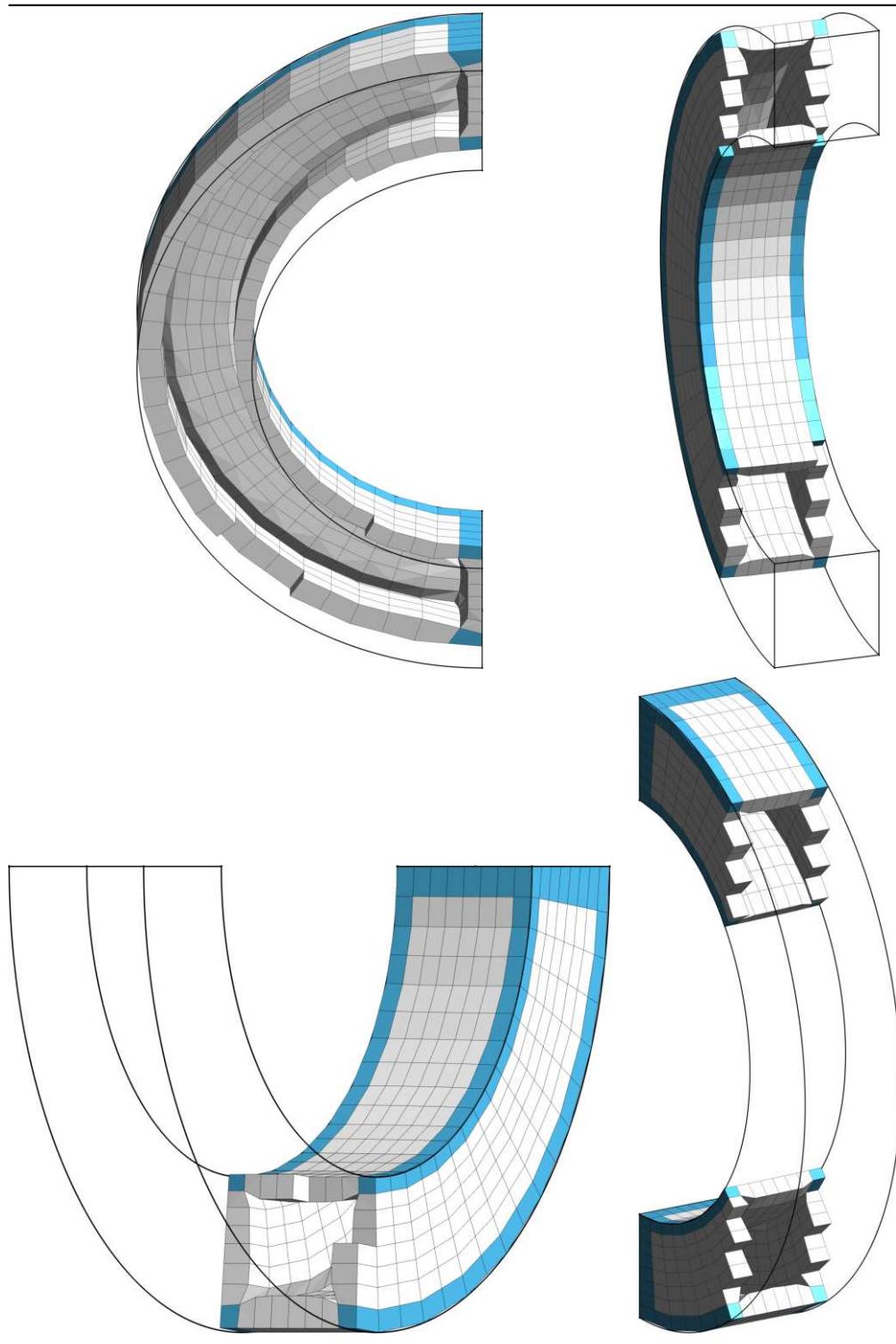
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
390	288	0.707	0.82	0.78	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.721687s	2308	1152	95.9409	-	-	0.390	0.65	0.66
Ours	0.000385s / 0.099828s	1948	968	0	0	0	0.659	0.82	0.83

Figures:



Model: B17

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

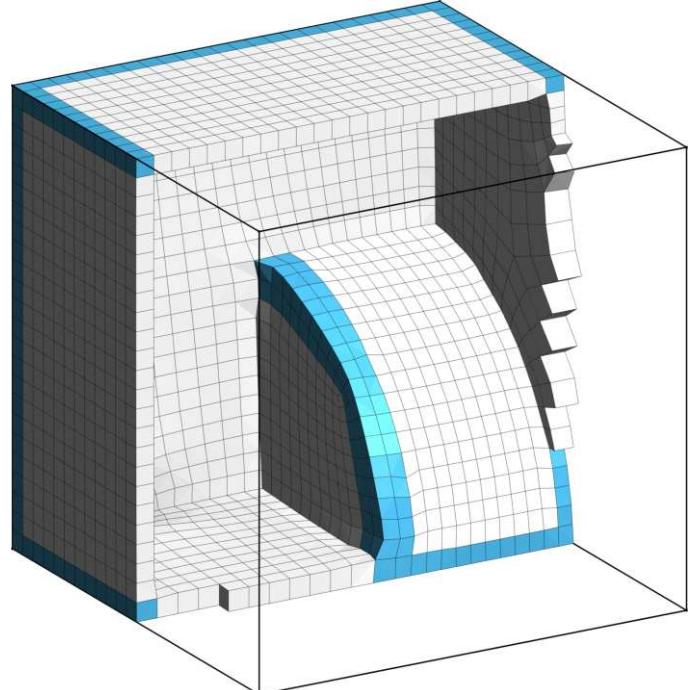
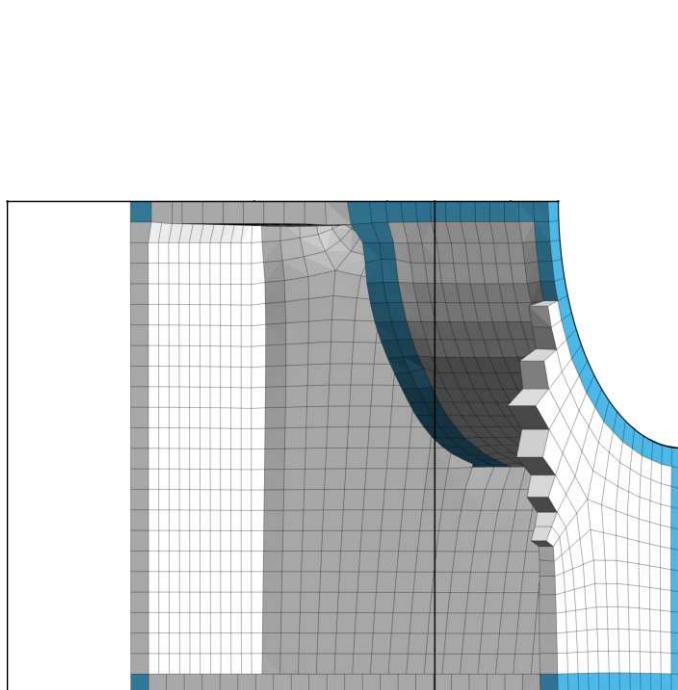
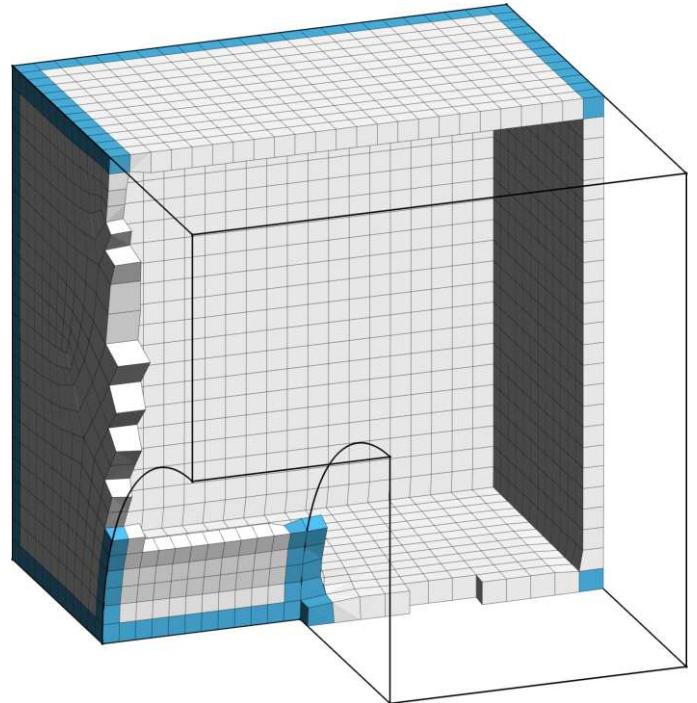
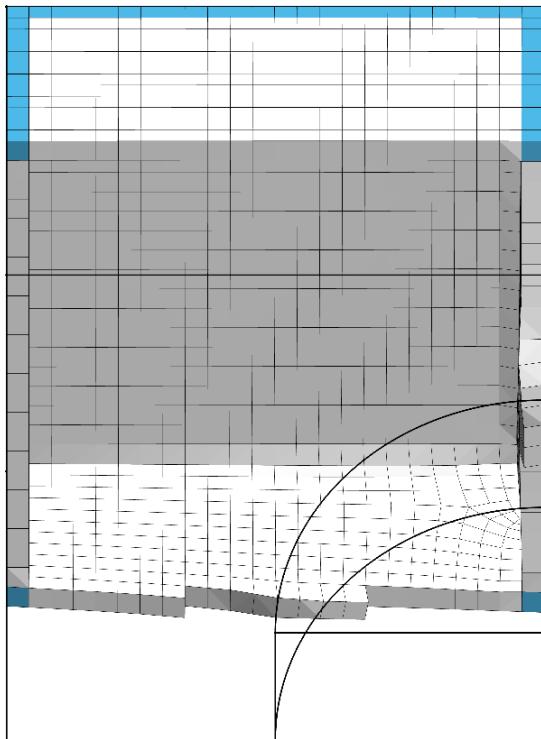
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1030	850	0.783	0.98	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.34341s	6804	3400	170.808	-	-	0.517	0.90	0.97
Ours	0.0017s / 0.184153s	6220	3104	0	0	0	0.814	0.98	0.99

Figures:



Model: B18

CAD: 10 corners, 15 curves, 7 surfaces, 1 volume

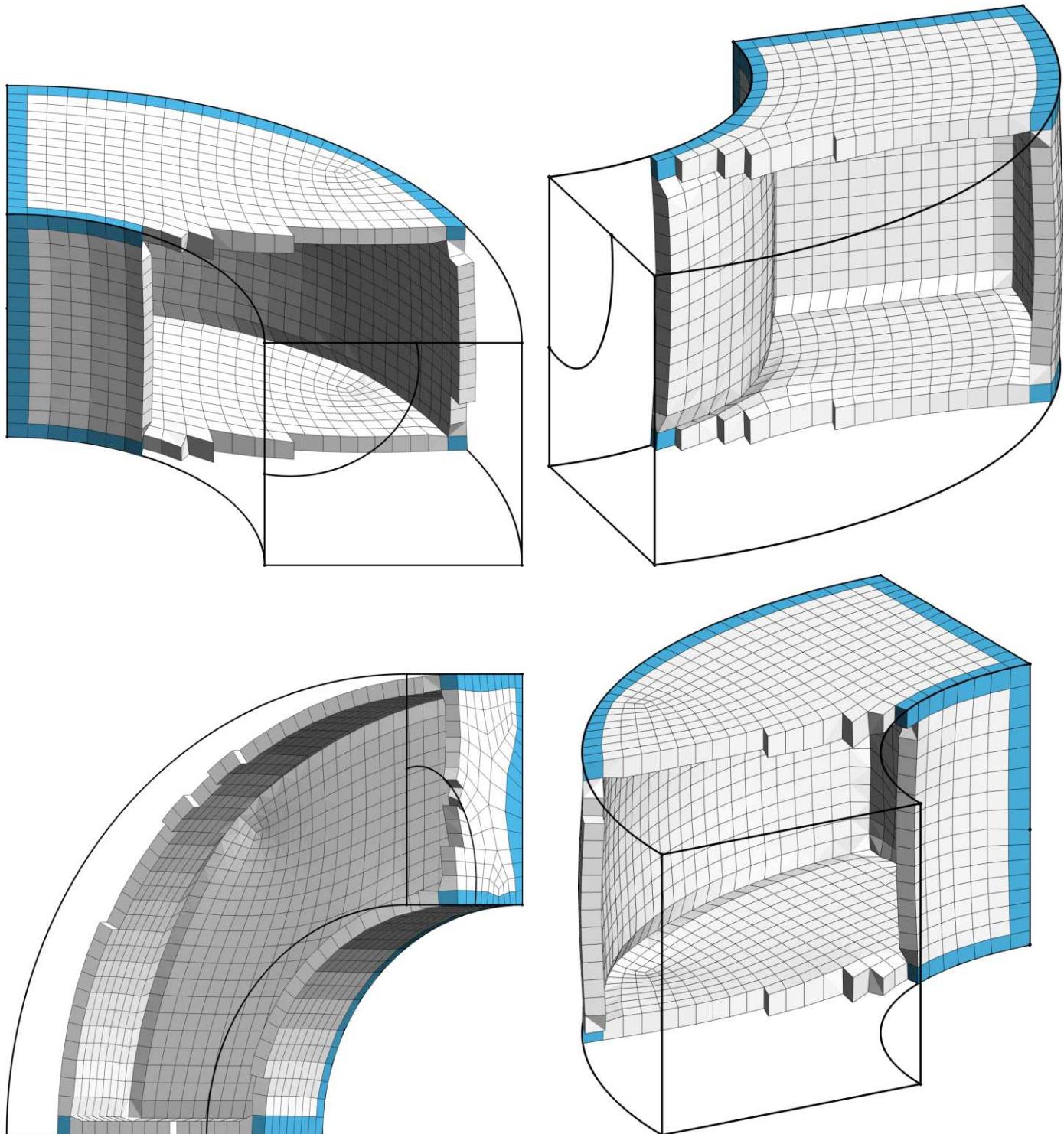
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
747	608	0.244	0.94	0.96	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.87825s	4868	2432	123.535	-	-	0.275	0.86	0.93
Ours	0.001186s / 0.123981s	4396	2192	0	0	0	0.272	0.94	0.95

Figures:



Model: B19

CAD: 14 corners, 21 curves, 9 surfaces, 1 volume

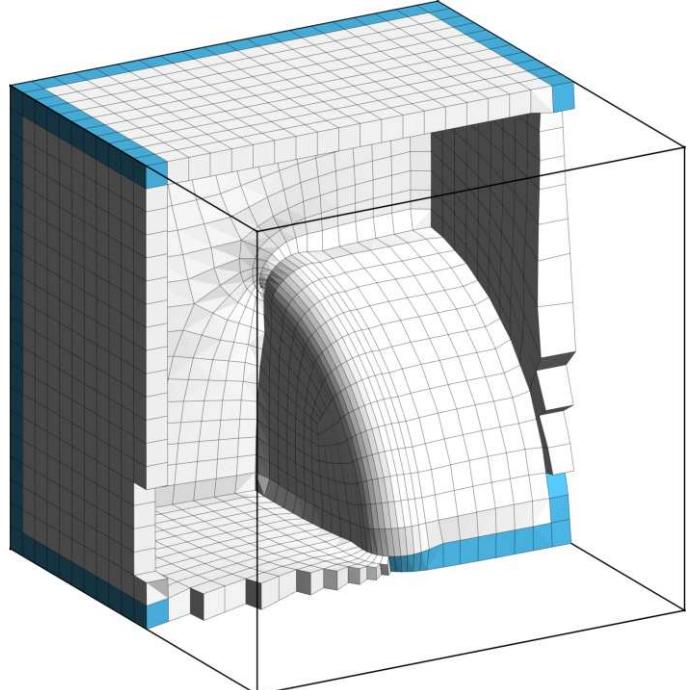
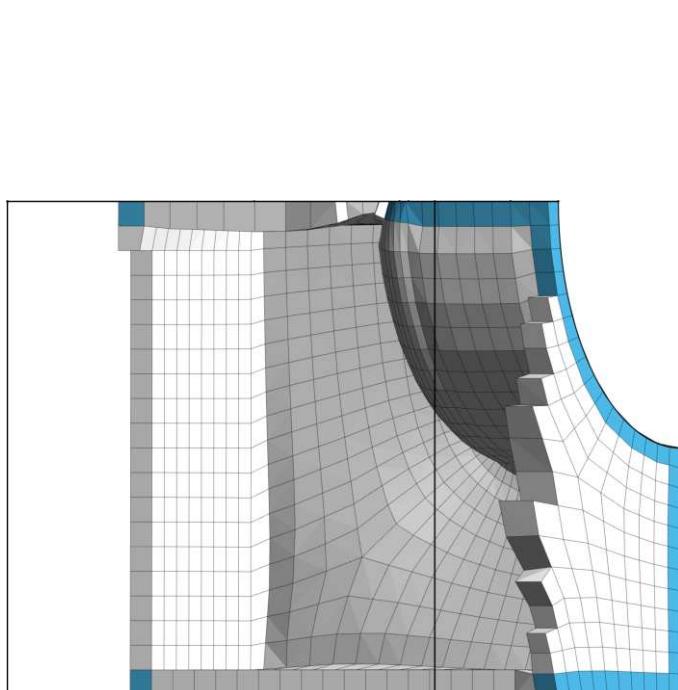
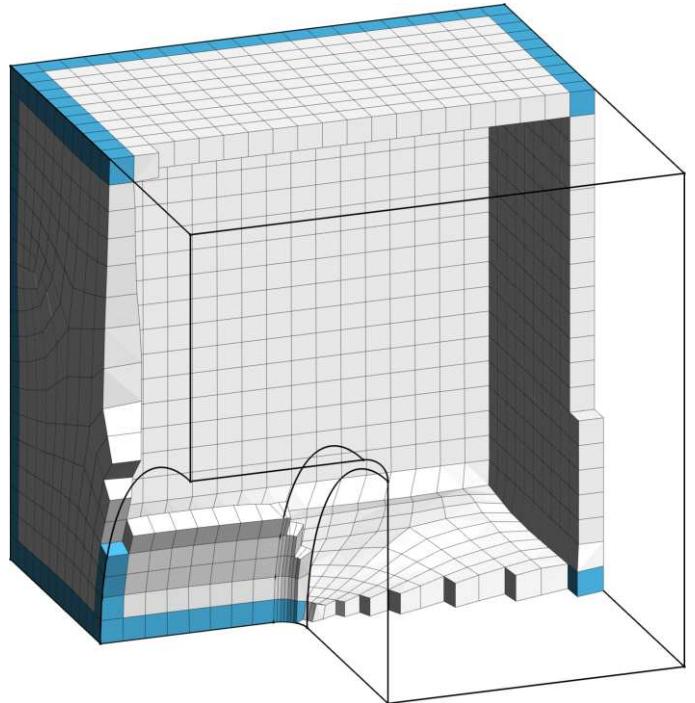
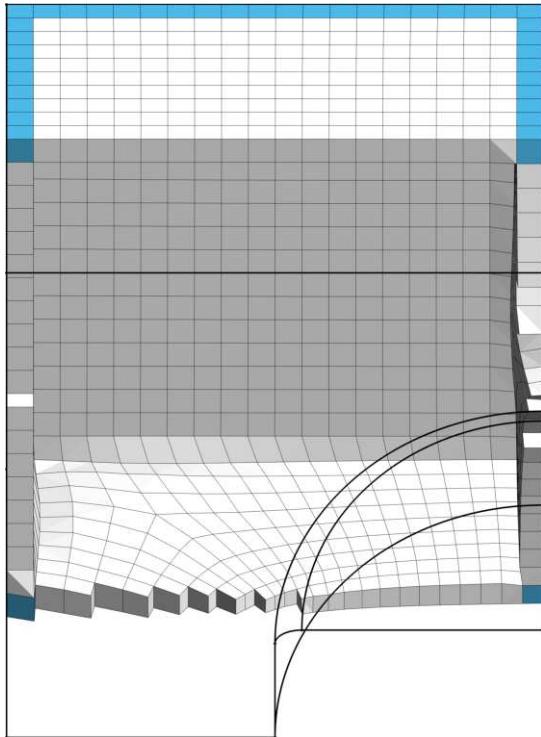
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
856	683	0.245	0.91	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.2535s	5468	2732	146.11	-	-	0.229	0.83	0.91
Ours	0.000773s / 0.194115s	4906	2446	0	0	0	0.231	0.91	0.99

Figures:



Model: B1

CAD: 20 corners, 32 curves, 12 surfaces, 1 volume

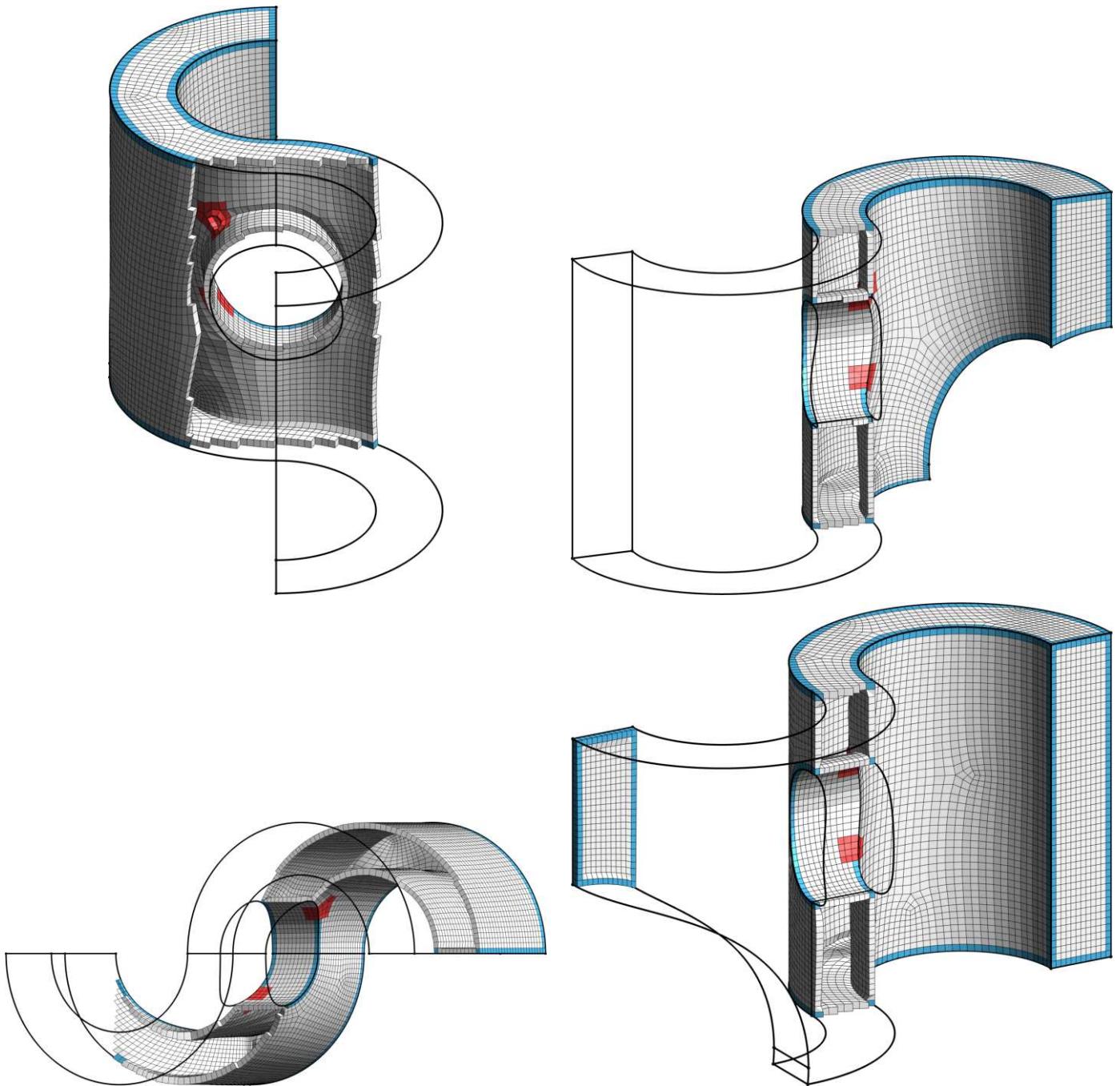
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
3694	3208	0.302	0.95	0.97	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 4.92856s	25664	12832	417.332	-	-	0.300	0.89	0.97
Ours	0.021276s / 0.840035s	24146	12070	21.5522	4	24	0.376	0.95	0.97

Figures:



Model: B20

CAD: 5 corners, 8 curves, 5 surfaces, 1 volume

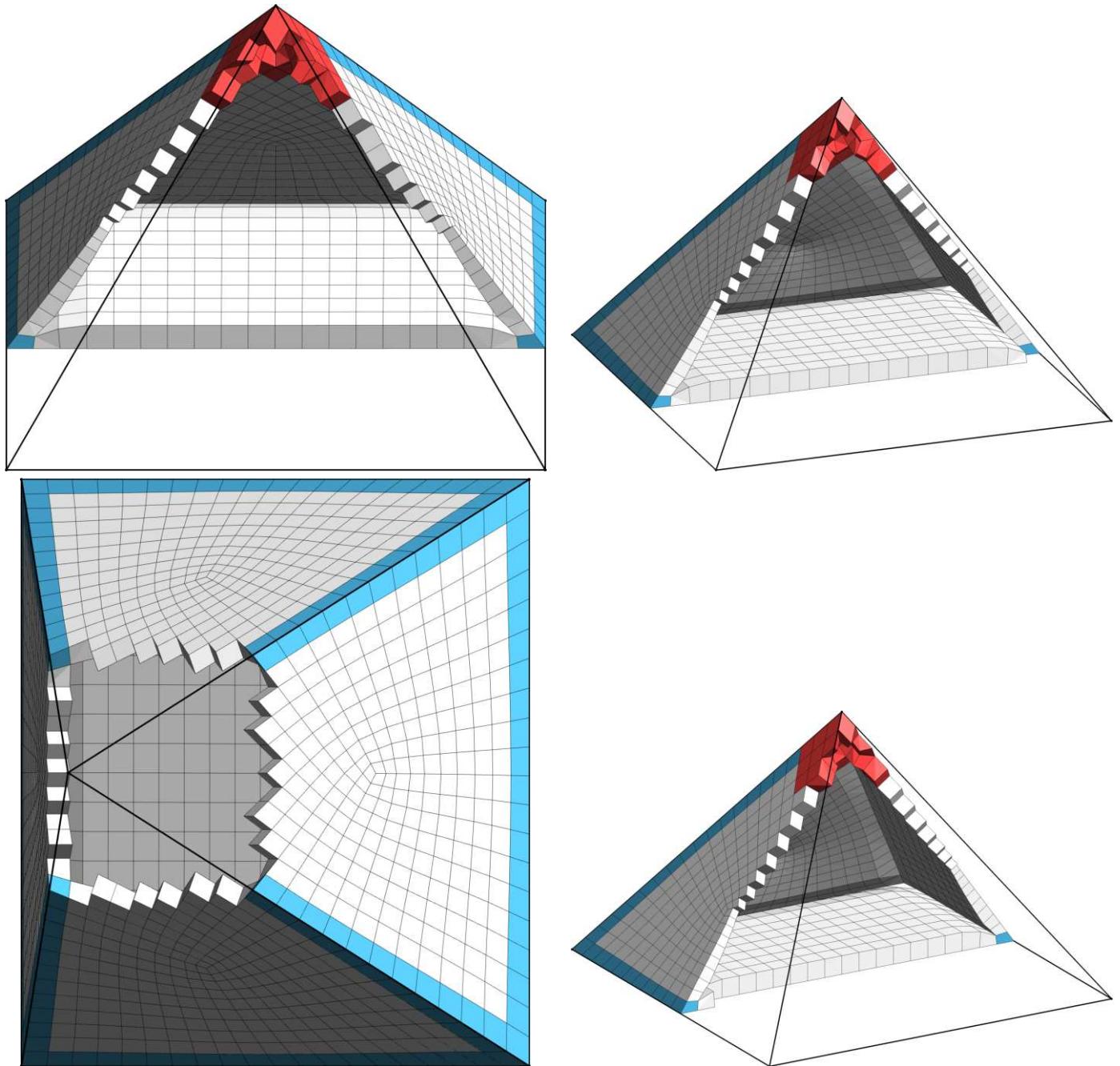
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
485	400	0.865	0.95	0.96	1

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.744615s	3204	1600	102.052	-	-	0.311	0.82	0.96
Ours	0.003971s / 0.124464s	2932	1464	10.4564	1	9	0.507	0.91	0.97

Figures:



Model: B21

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

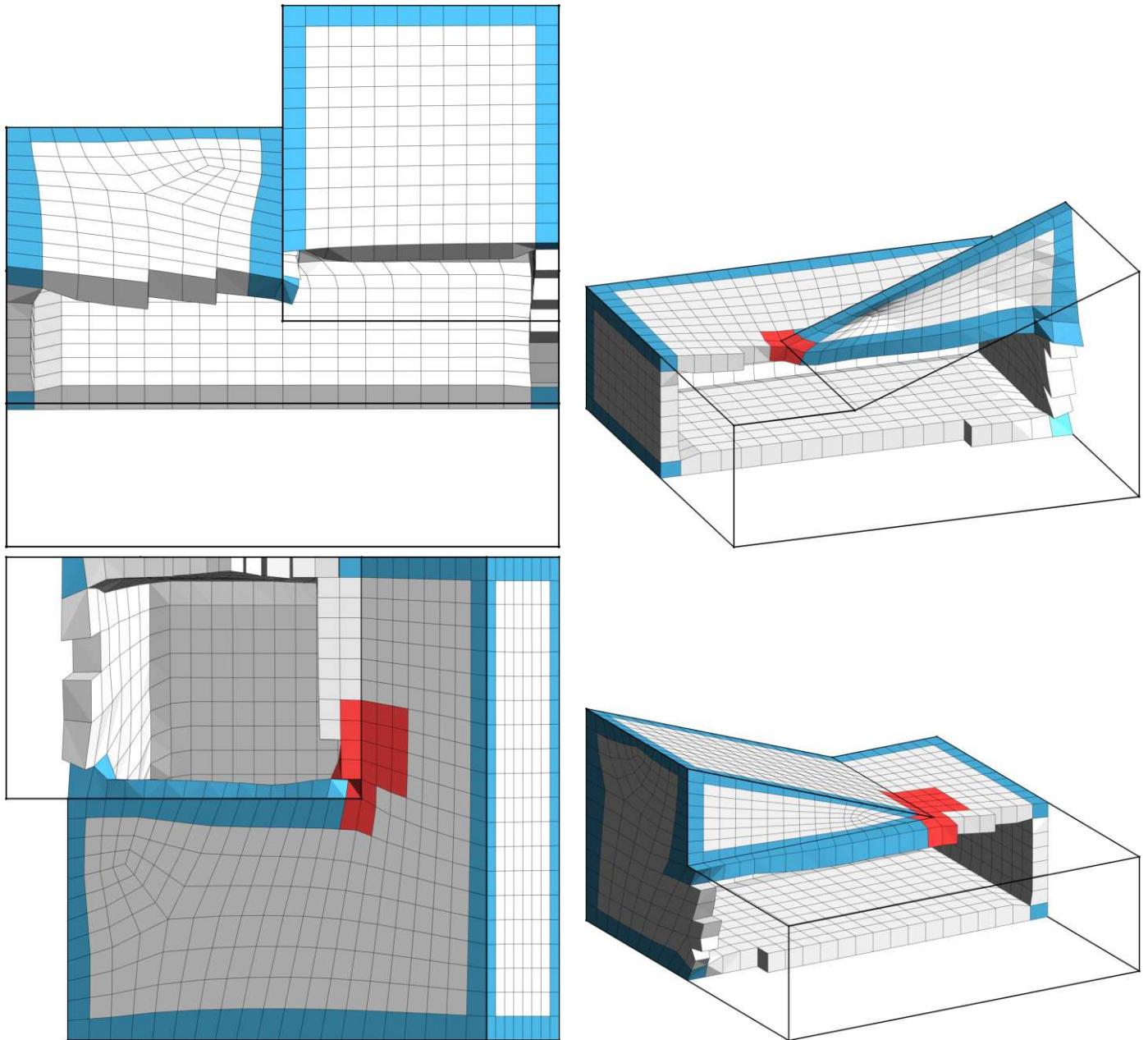
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
567	431	0.341	0.92	0.96	1

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.07591s	3452	1724	124.963	-	-	0.210	0.81	0.84
Ours	0.018353s / 0.239653s	3072	1530	4.20988	1	5	0.317	0.92	0.96

Figures:



Model: B23

CAD: 6 corners, 9 curves, 5 surfaces, 1 volume

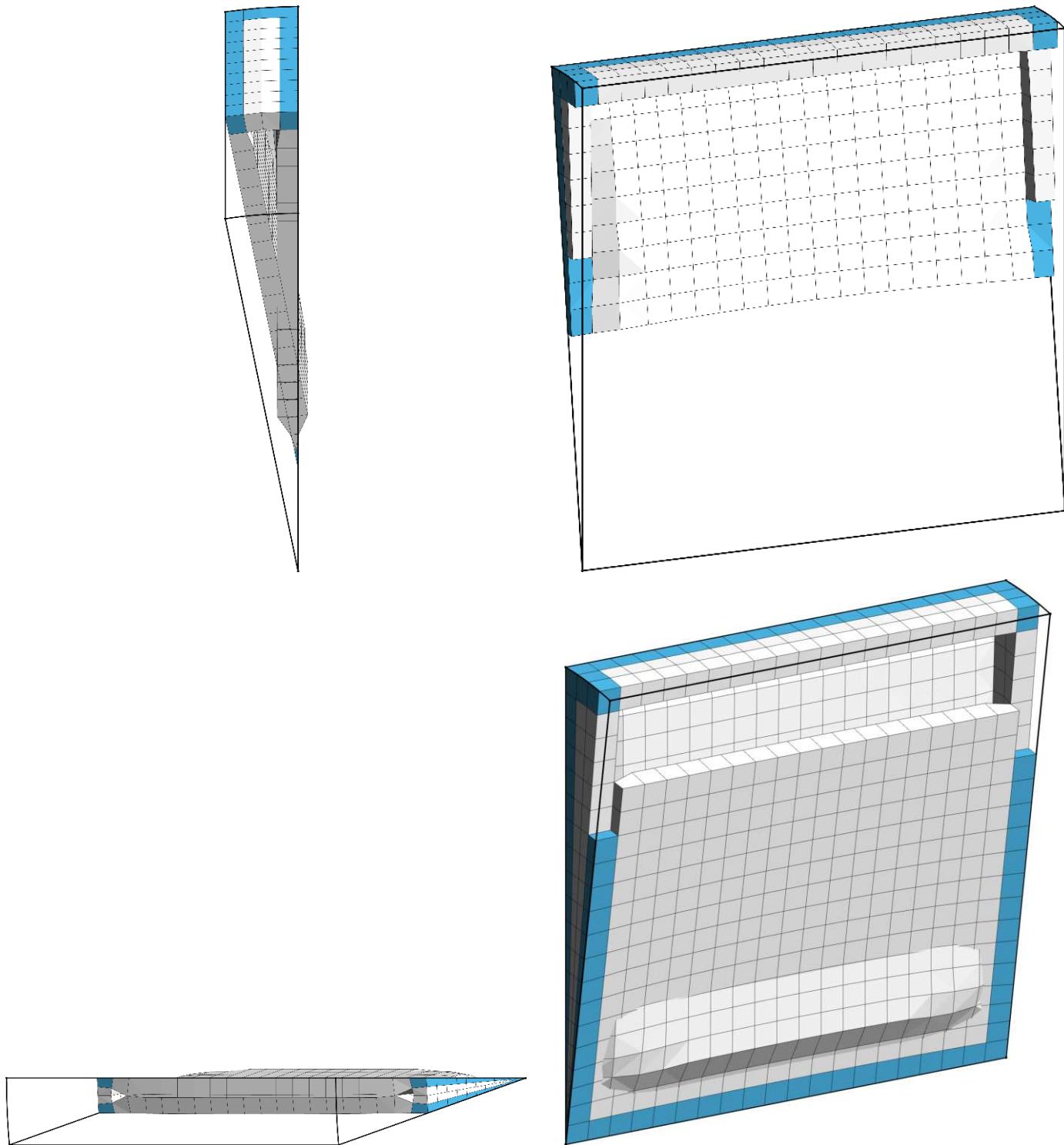
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
337	258	0.173	0.93	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 26.5502s	2068	1032	100.806	-	-	-0.02	0.74	0.85
Ours	0.000535s / 0.244697s	1790	890	0	0	0	0.111	0.83	0.98

Figures:



Model: B24

CAD: 8 corners, 12 curves, 6 surfaces, 1 volume

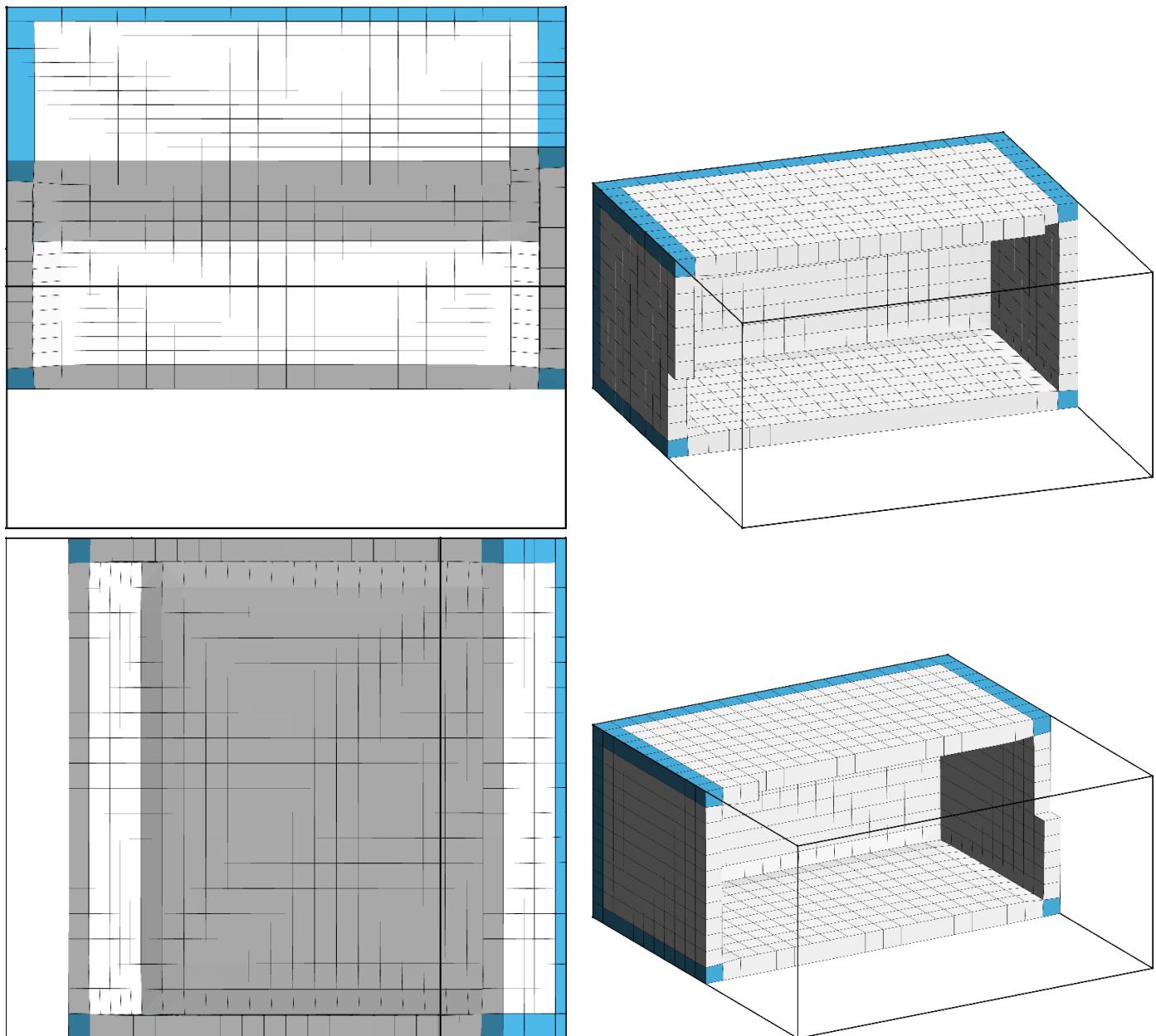
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
550	440	0.978	0.99	0.98	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.54737s	3524	1760	104	-	-	0.571	0.87	0.96
Ours	0.000647s / 0.117502s	3132	1560	0	0	0	0.978	0.99	0.98

Figures:



Model: B25

CAD: 11 corners, 17 curves, 8 surfaces, 1 volume

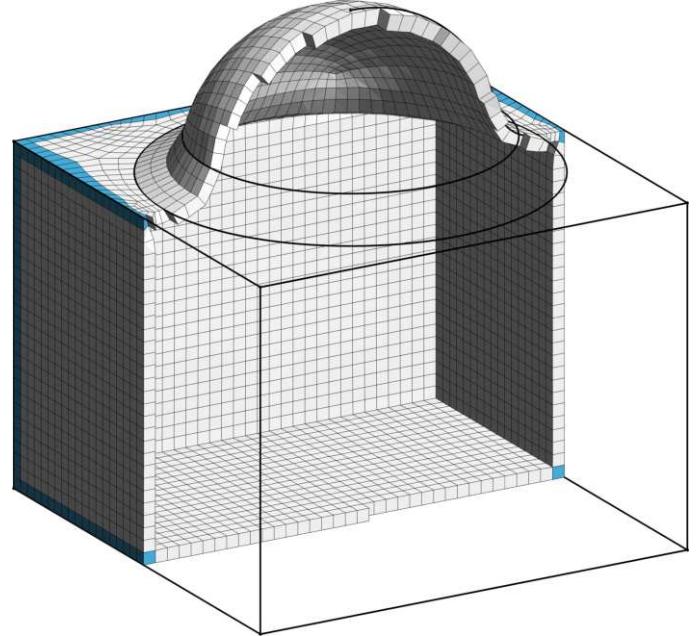
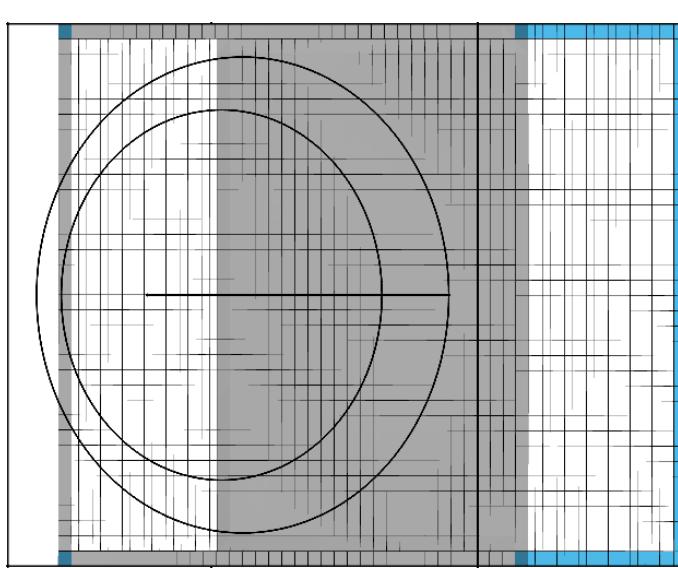
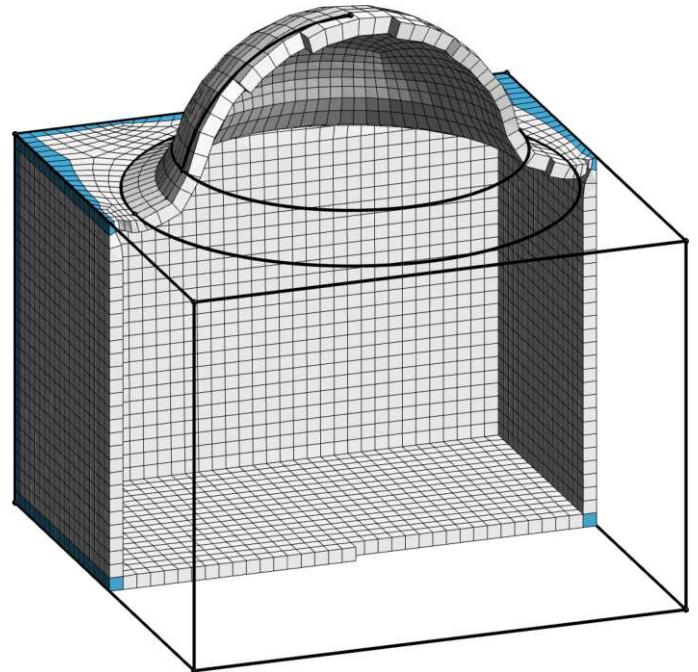
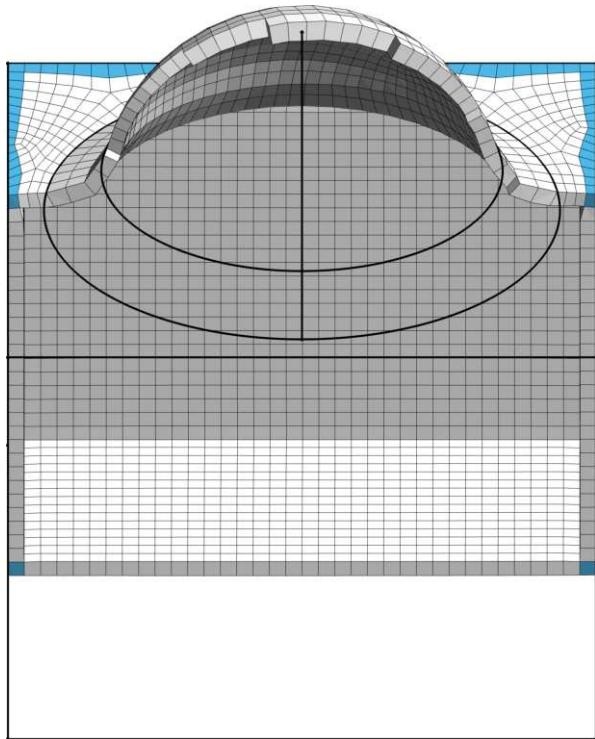
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2050	1756	0.447	0.97	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 2.16051s	14052	7024	200	-	-	0.421	0.92	0.99
Ours	0.003455s / 0.653331s	13276	6632	0	0	0	0.518	0.97	0.99

Figures:



Model: B27

CAD: 10 corners, 15 curves, 7 surfaces, 1 volume

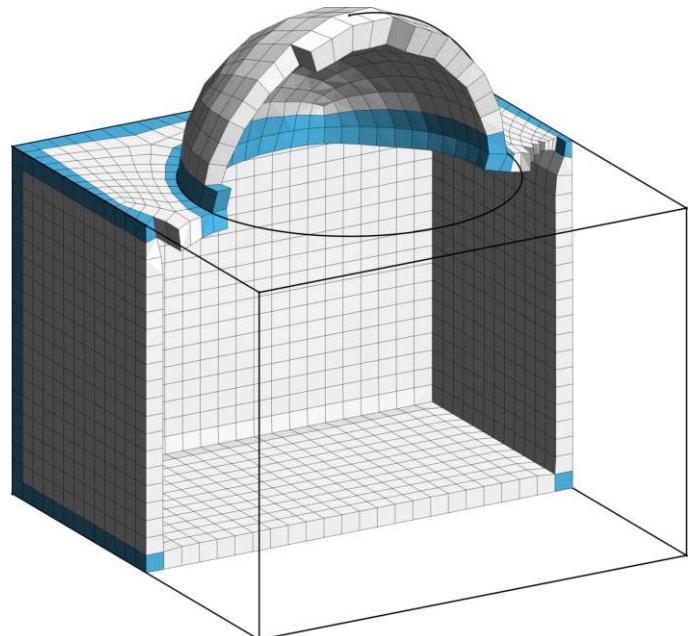
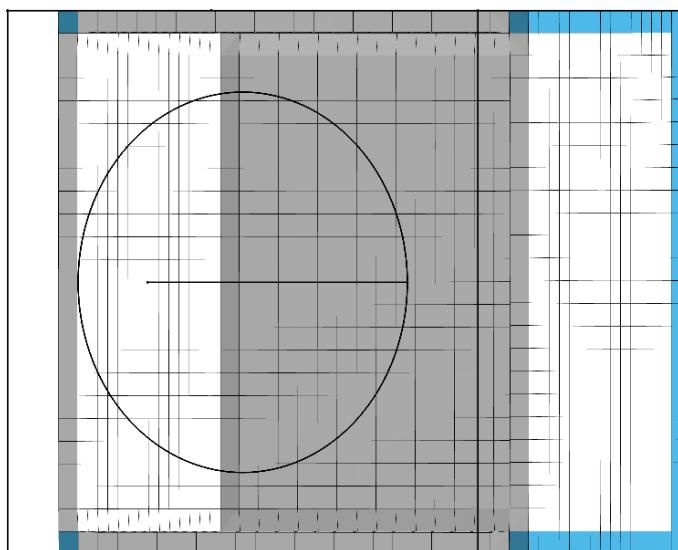
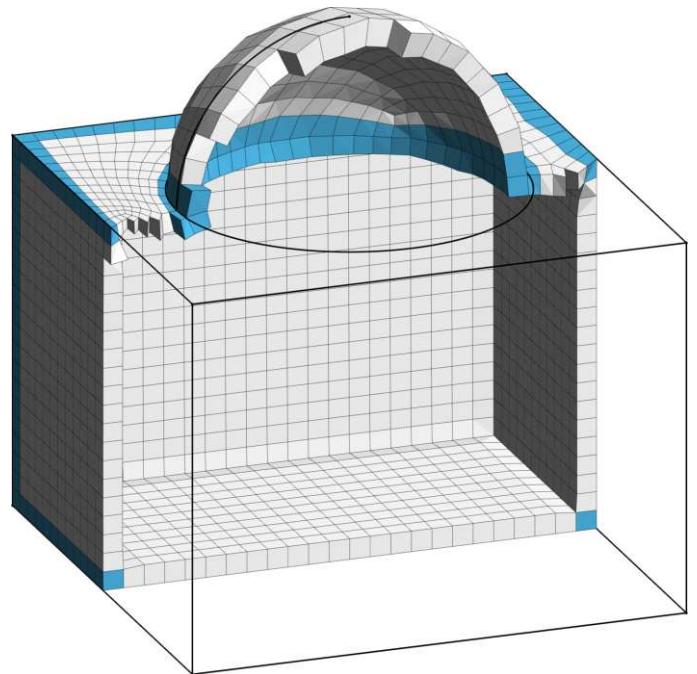
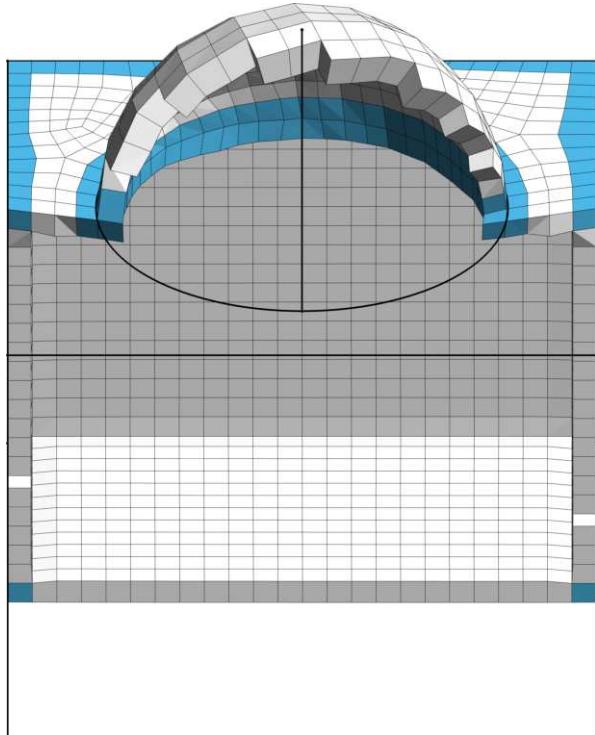
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
983	815	0.486	0.96	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.971395s	6524	3260	157.628	-	-	0.417	0.88	0.96
Ours	0.000862s / 0.249305s	6108	3048	0	0	0	0.562	0.96	0.99

Figures:



Model: B28

CAD: 10 corners, 15 curves, 7 surfaces, 1 volume

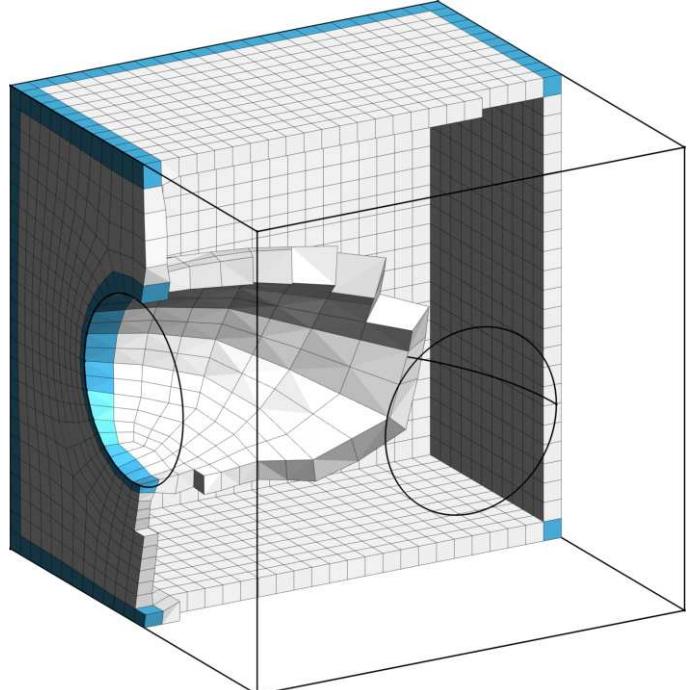
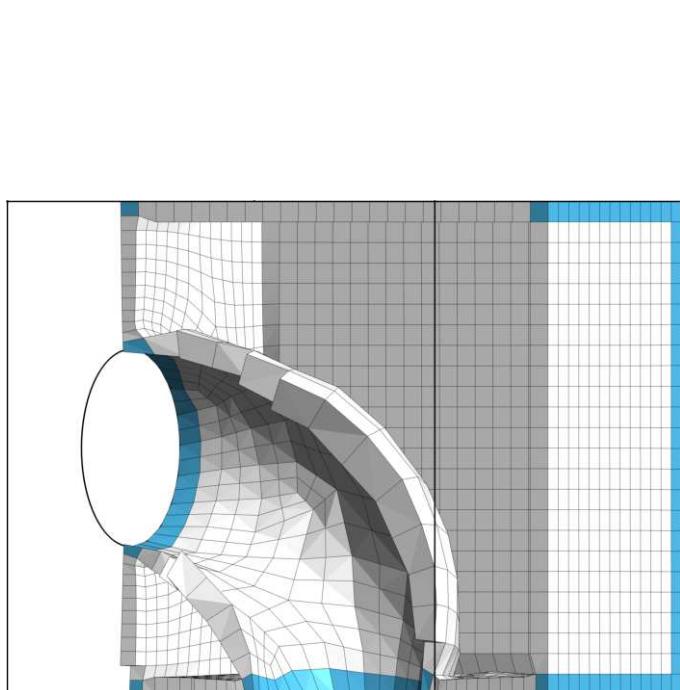
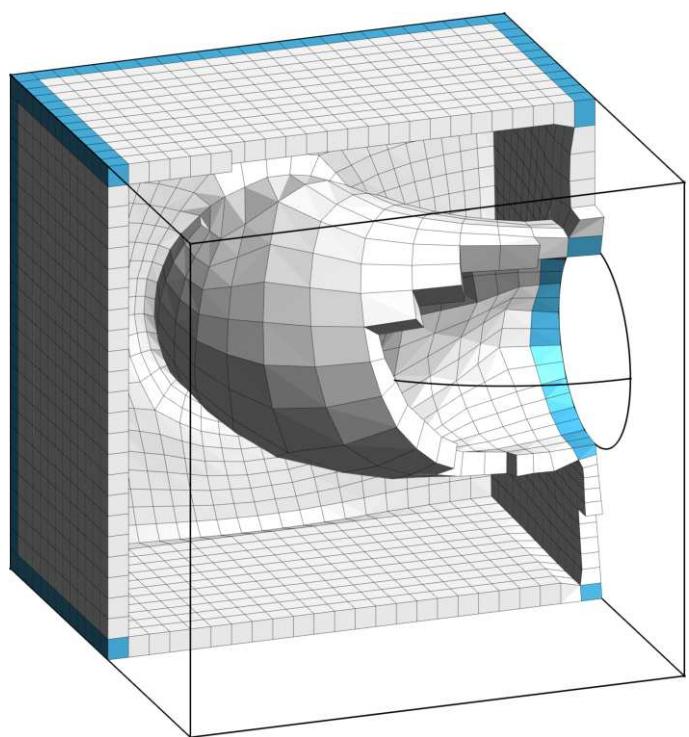
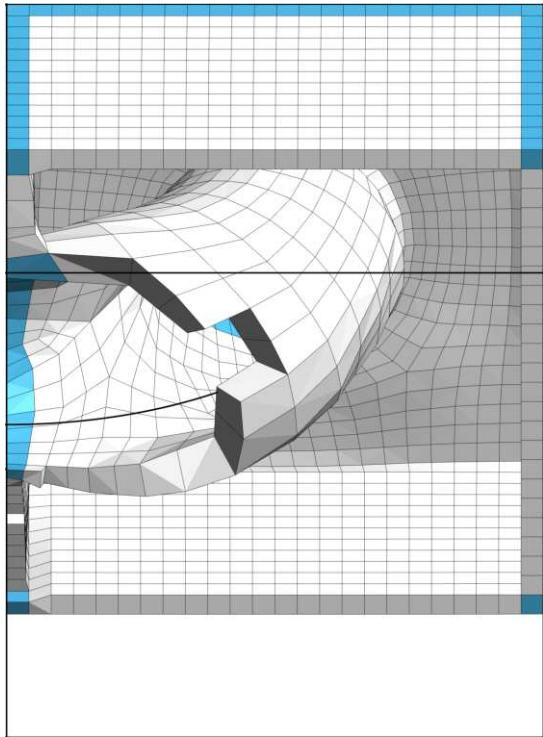
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1189	1001	0.158	0.94	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 3.73936s	8008	4004	184.964	-	-	0.032	0.86	0.93
Ours	0.001141s / 0.289345s	7296	3644	0	0	0	0.026	0.95	0.99

Figures:



Model: B29

CAD: 10 corners, 15 curves, 7 surfaces, 1 volume

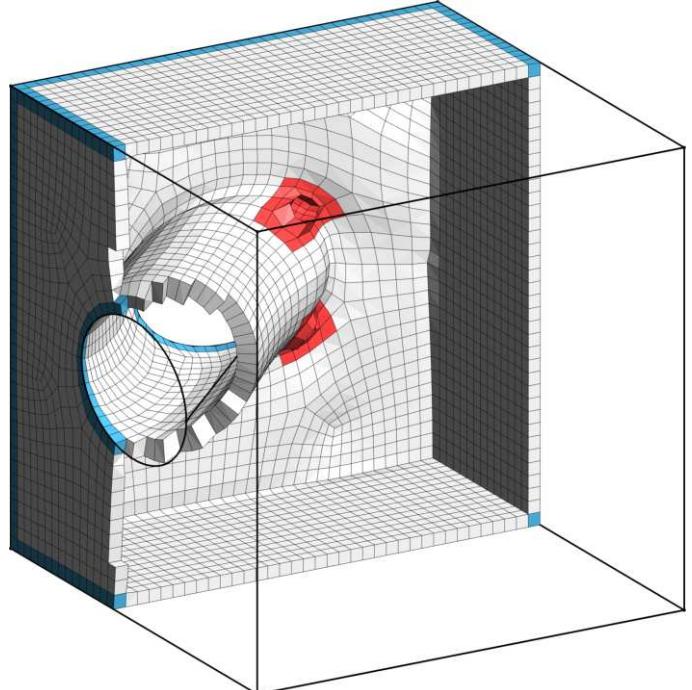
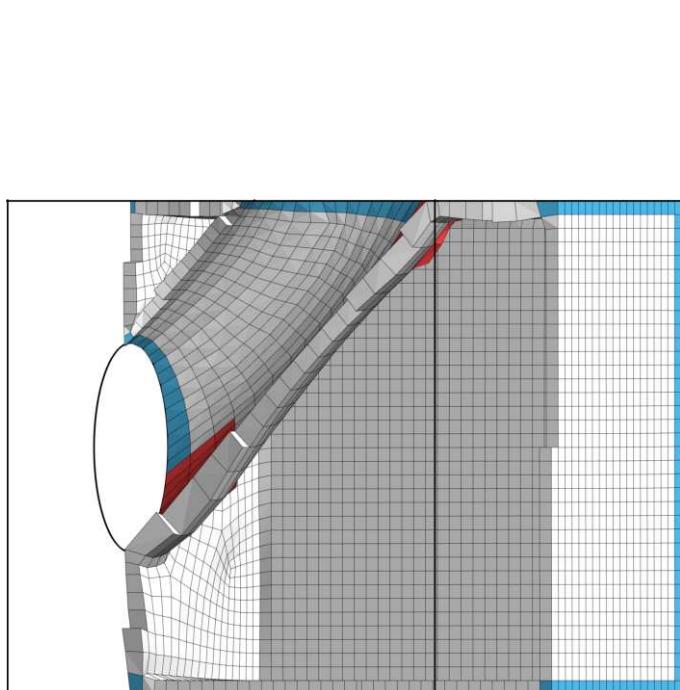
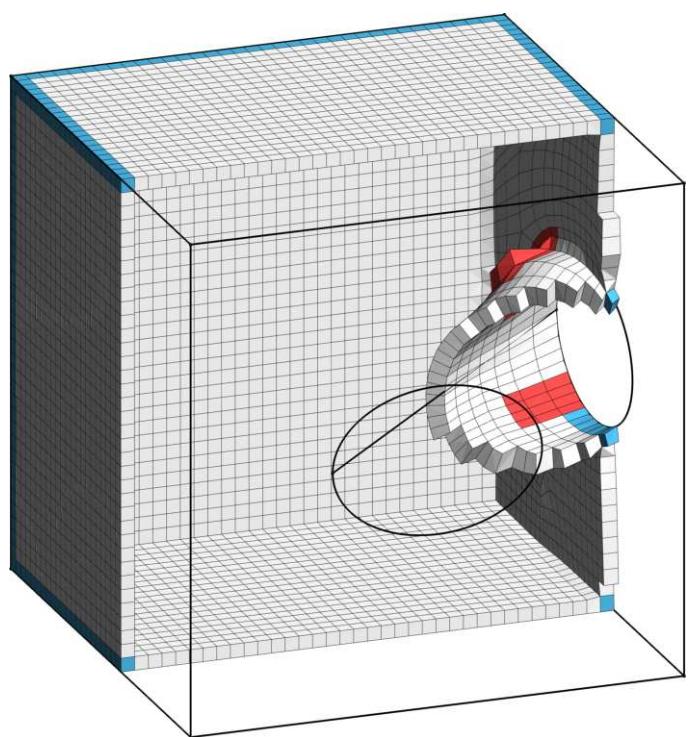
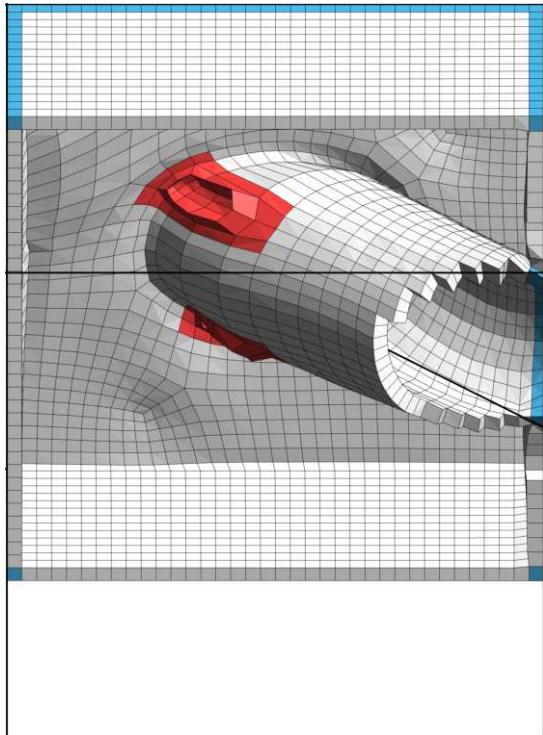
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2230	1966	0.362	0.95	0.99	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 11.5507s	15728	7864	259.793	-	-	0.175	0.90	0.99
Ours	0.208546s / 0.726553s	14848	7422	21.6308	3	24	0.309	0.95	0.99

Figures:



Model: B2

CAD: 10 corners, 15 curves, 8 surfaces, 1 volume

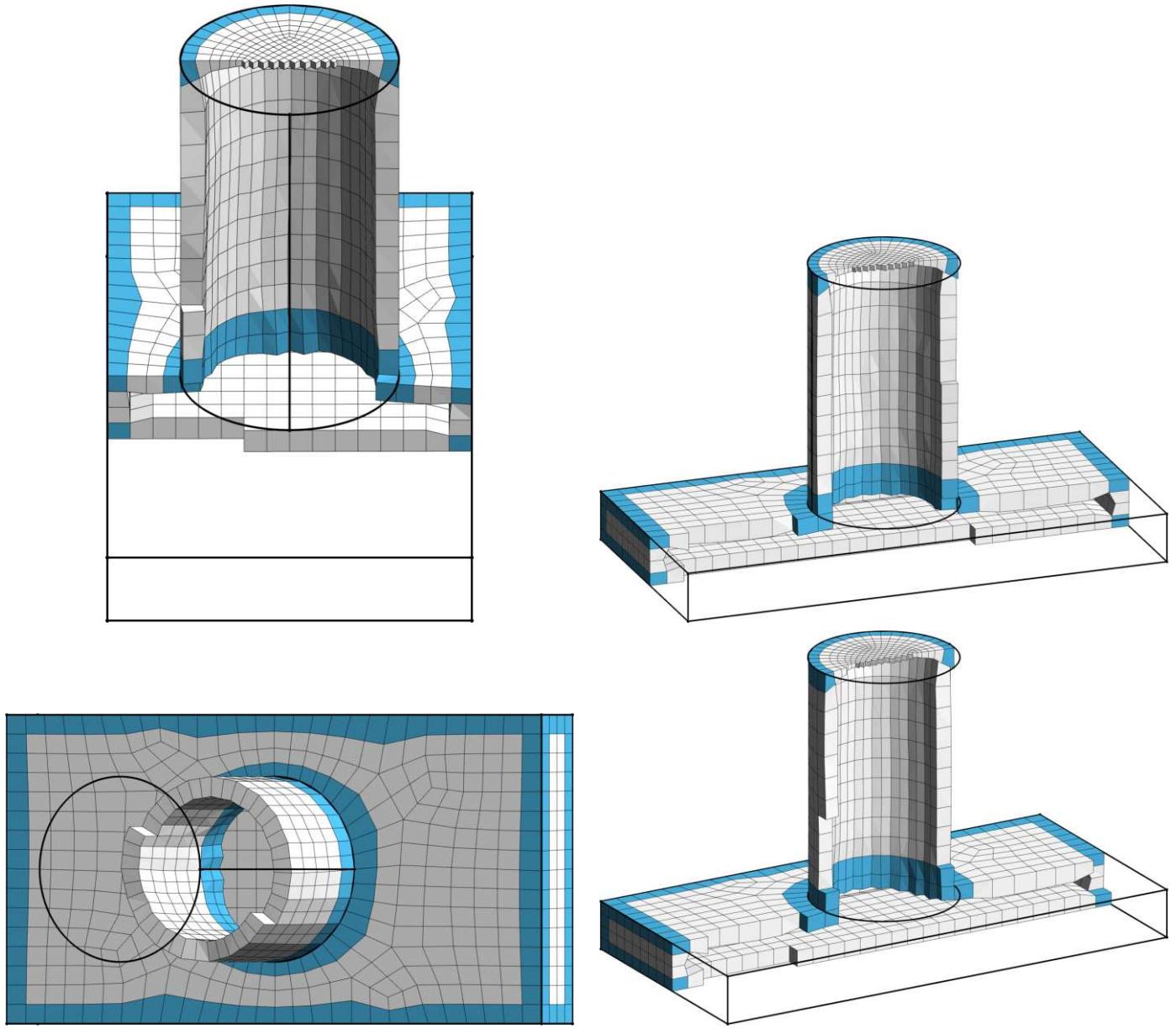
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
635	493	0.654	0.92	0.95	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.736593s	3948	1972	136.068	-	-	0.510	0.80	0.79
Ours	0.00068s / 0.163734s	3588	1788	0	0	0	0.675	0.90	0.93

Figures:



Model: B30

CAD: 16 corners, 28 curves, 14 surfaces, 1 volume

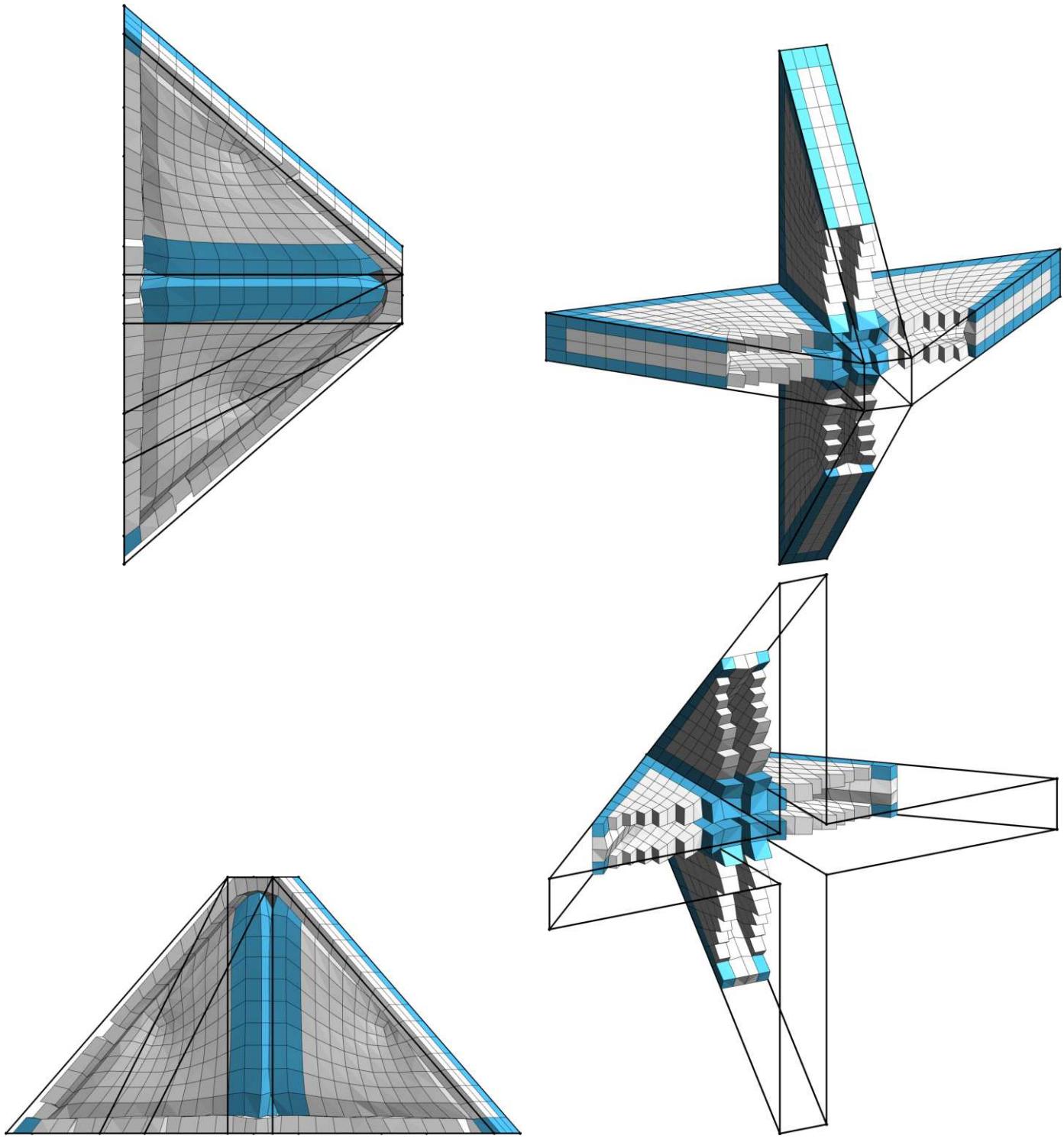
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
542	376	0.675	0.80	0.80	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.920433s	3012	1504	154	-	-	0.350	0.65	0.62
Ours	0.000499s / 0.463556s	2628	1312	0	0	0	0.674	0.82	0.82

Figures:



Model: B31

CAD: 24 corners, 36 curves, 14 surfaces, 1 volume

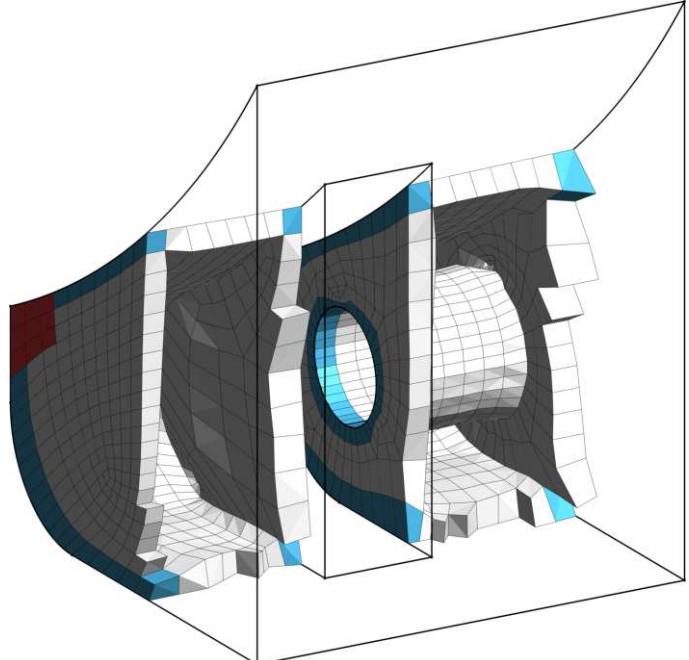
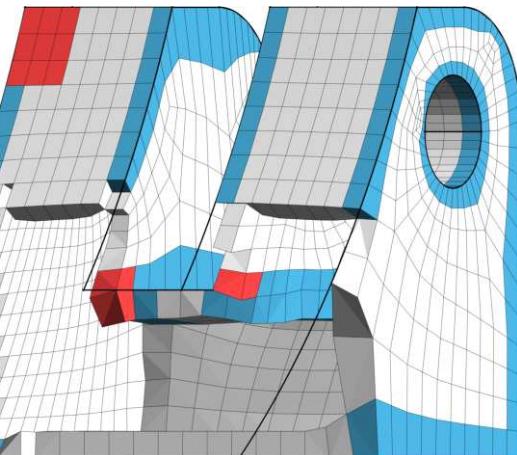
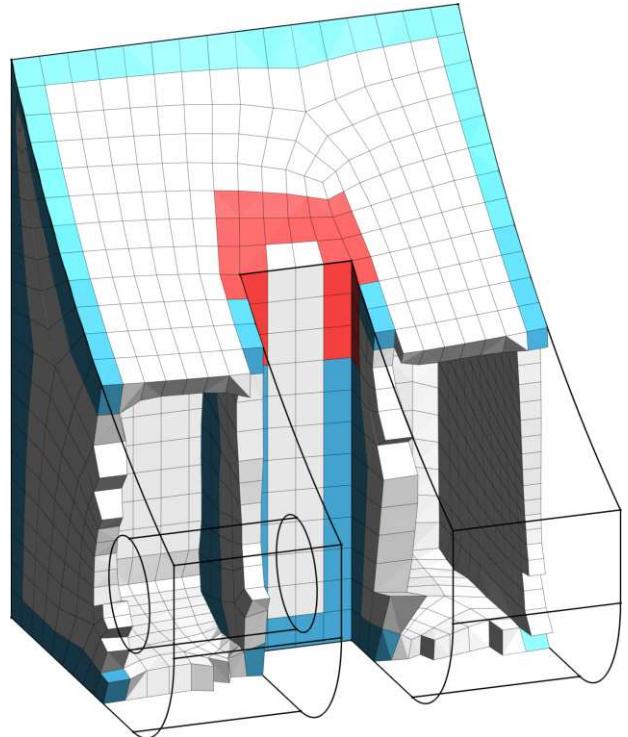
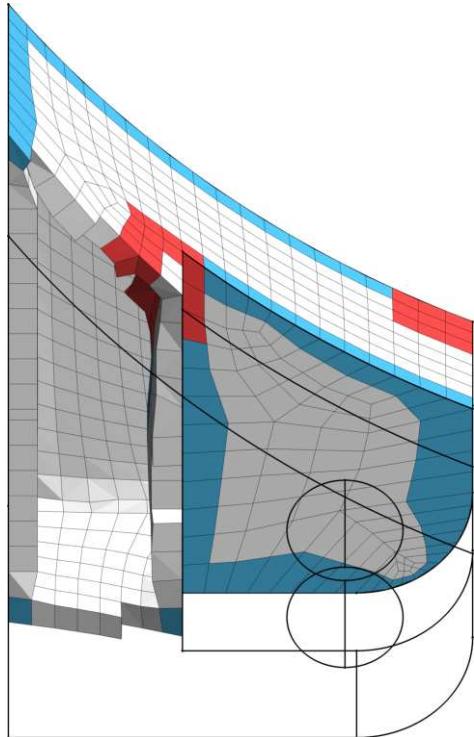
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
832	612	0.406	0.84	0.88	3

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.81785s	4896	2448	185.7	-	-	0.239	0.77	0.77
Ours	1.79076s / 0.335847s	4346	2174	13.7955	2	14	0.332	0.83	0.86

Figures:



Model: B32

CAD: 26 corners, 39 curves, 15 surfaces, 1 volume

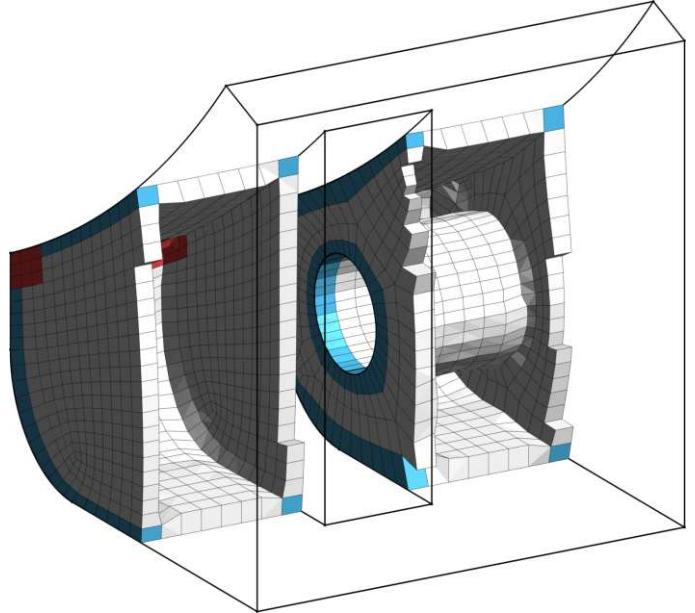
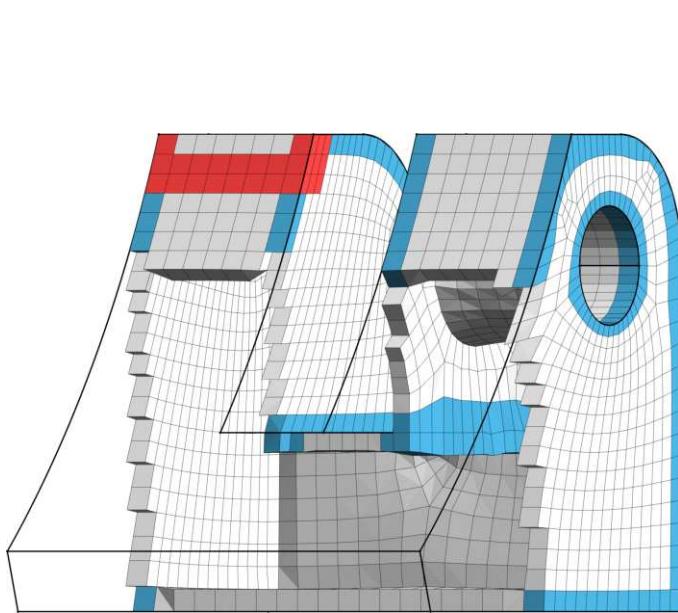
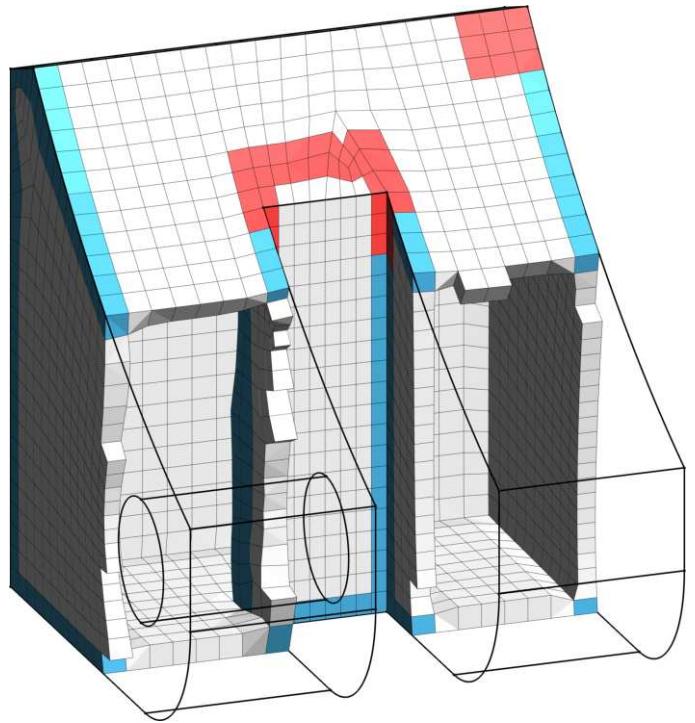
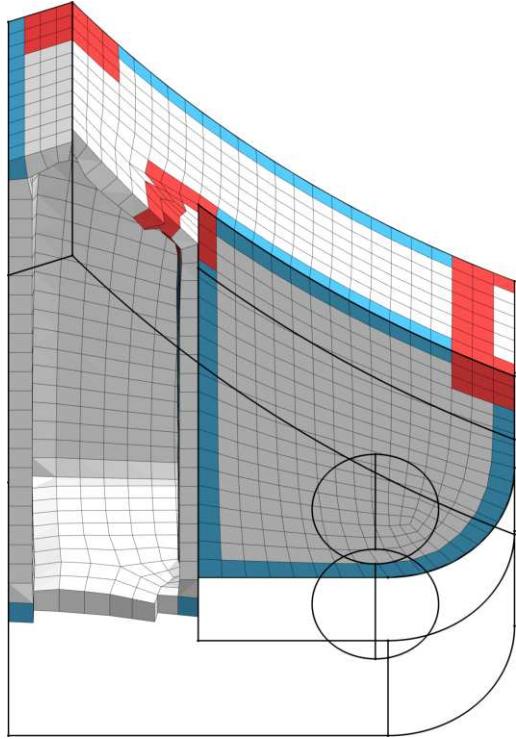
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1163	888	0.478	0.89	0.93	5

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.20949s	7104	3552	212.143	-	-	0.430	0.83	0.86
Ours	2.99939s / 0.380072s	6510	3258	31.634	3	30	0.257	0.88	0.92

Figures:



Model: B33

CAD: 26 corners, 39 curves, 15 surfaces, 1 volume

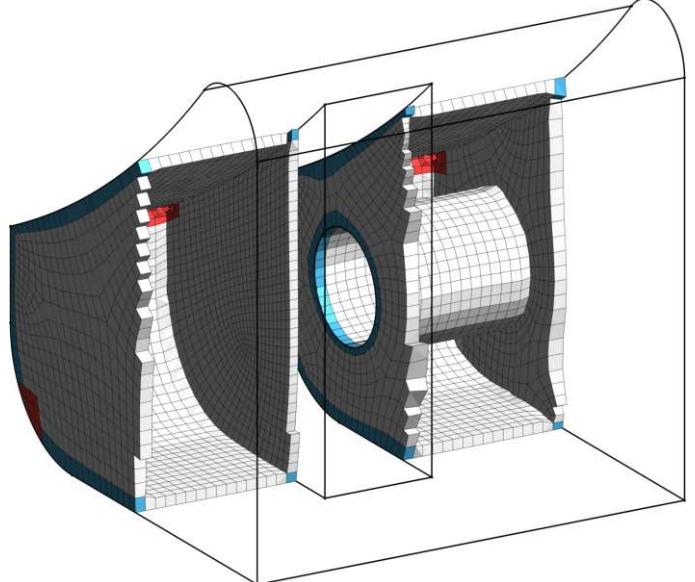
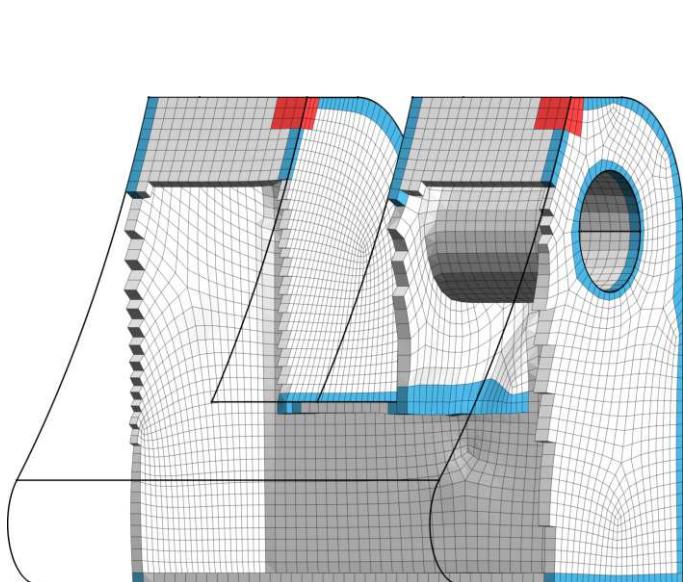
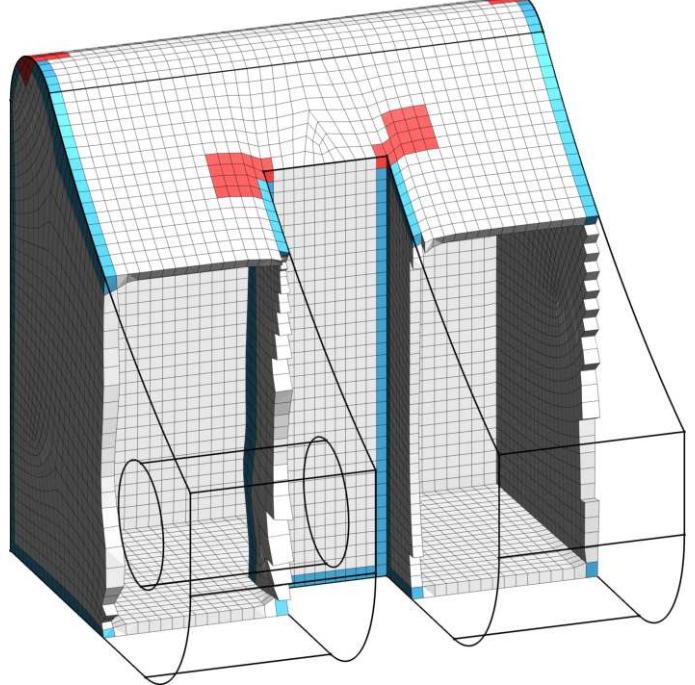
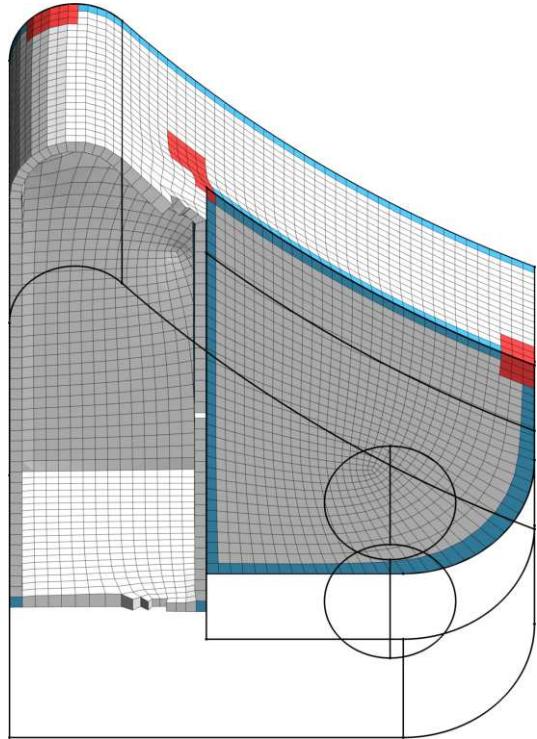
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
3101	2644	0.195	0.95	0.99	7

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 3.06146s	21152	10576	334.002	-	-	0.199	0.91	0.97
Ours	3.0041s / 0.835612s	20274	10142	51.9807	6	45	0.187	0.95	0.98

Figures:



Model: B34

CAD: 11 corners, 18 curves, 7 surfaces, 1 volume

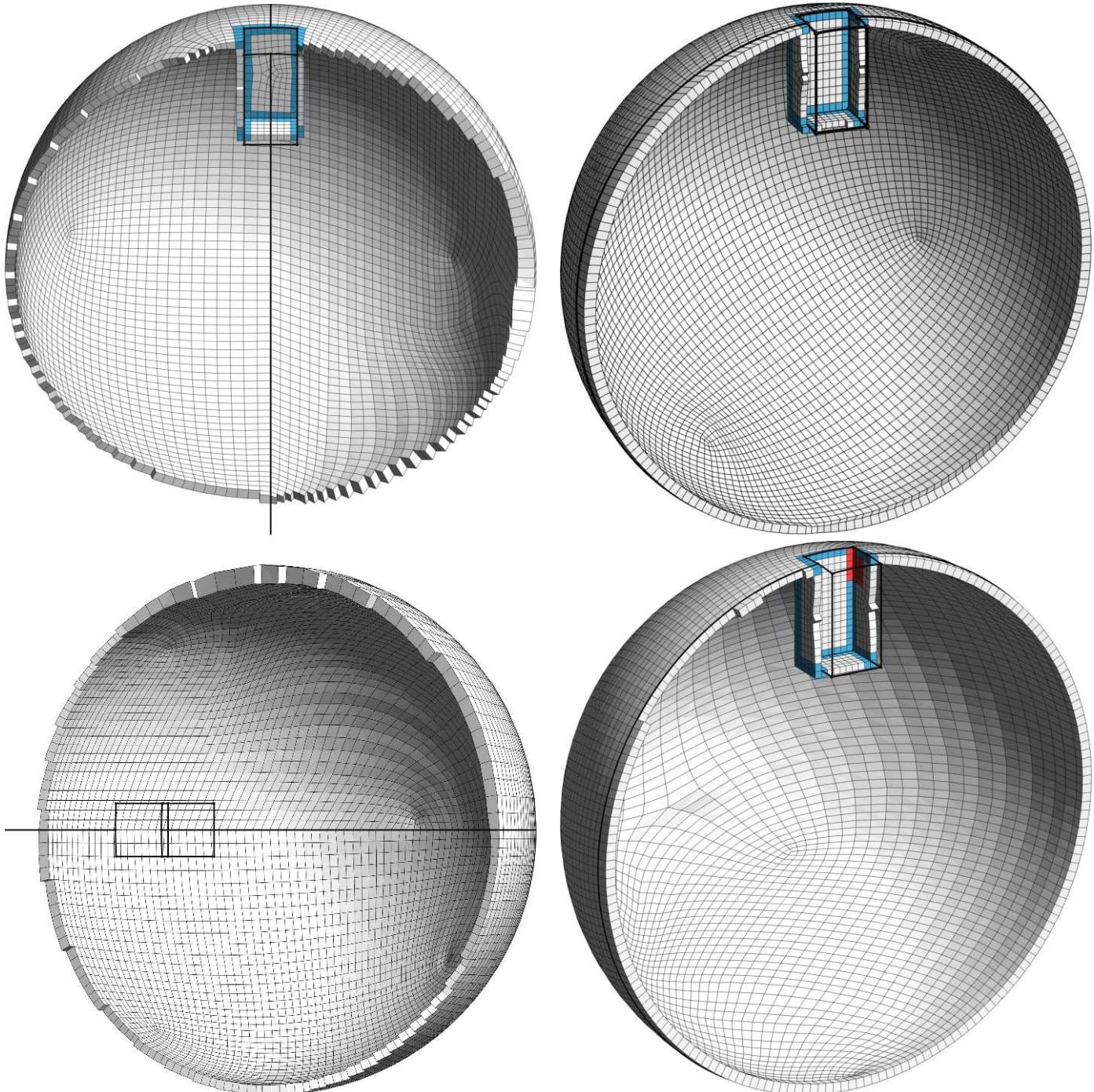
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2662	2503	0.141	0.92	0.95	1

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.75241s	20028	10012	62.7556	-	-	0.152	0.93	0.96
Ours	0.007241s / 0.615467s	20154	10074	4	1	5	0.152	0.94	0.97

Figures:



Model: B35

CAD: 24 corners, 40 curves, 19 surfaces, 1 volume

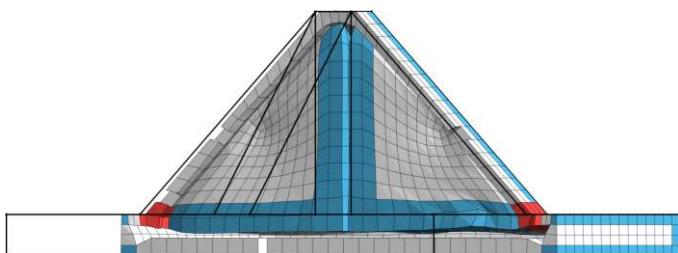
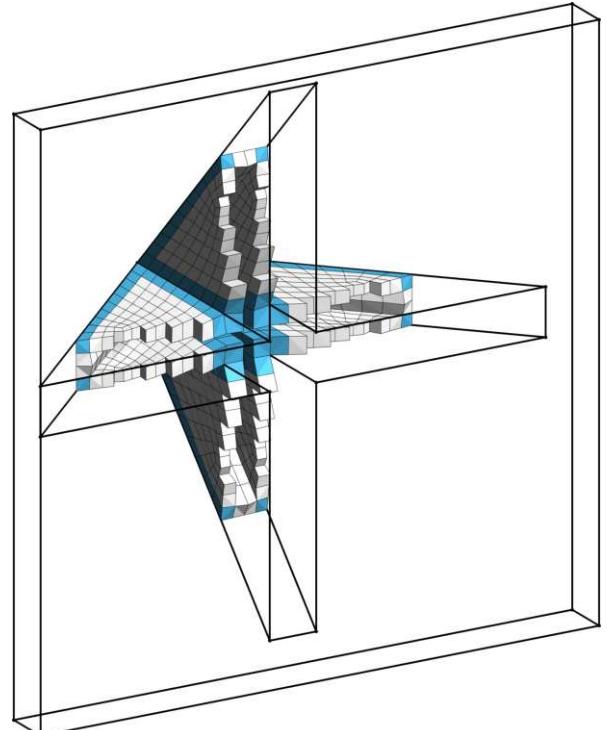
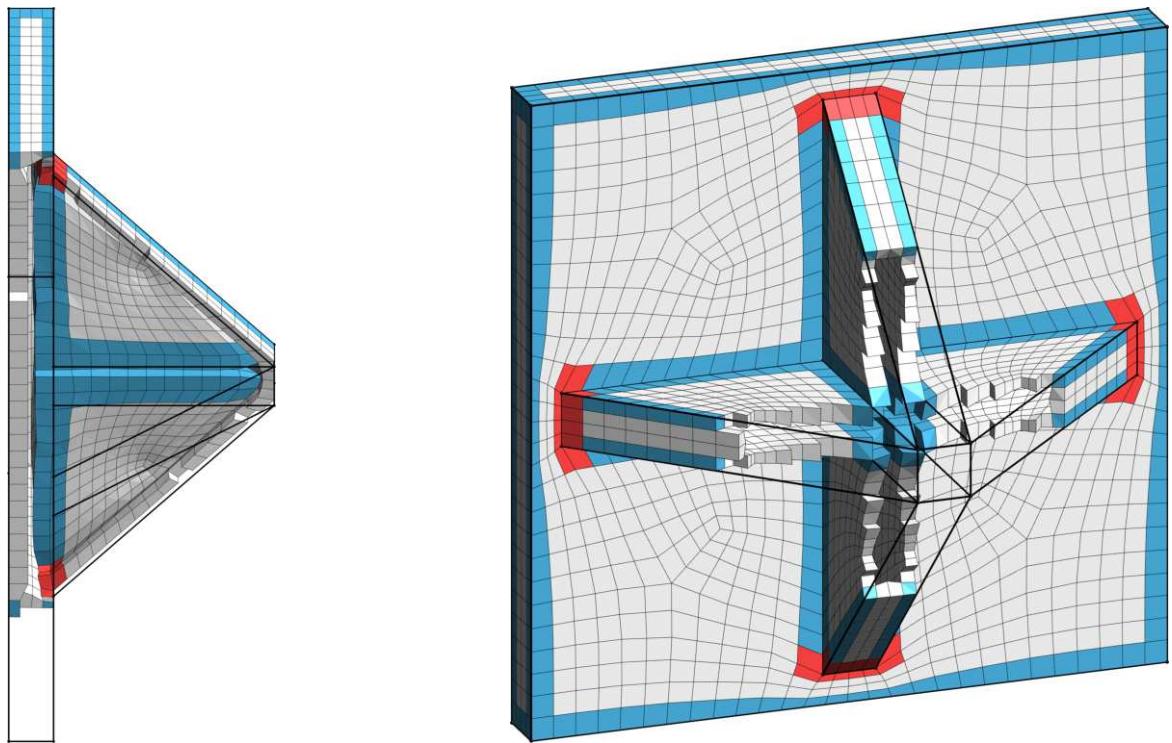
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1130	840	0.534	0.86	0.86	8

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.78961s	6724	3360	256	-	-	0.363	0.75	0.76
Ours	0.090645s / 0.89541s	6308	3152	2	4	12	0.288	0.88	0.88

Figures:



Model: B36

CAD: 48 corners, 72 curves, 28 surfaces, 1 volume

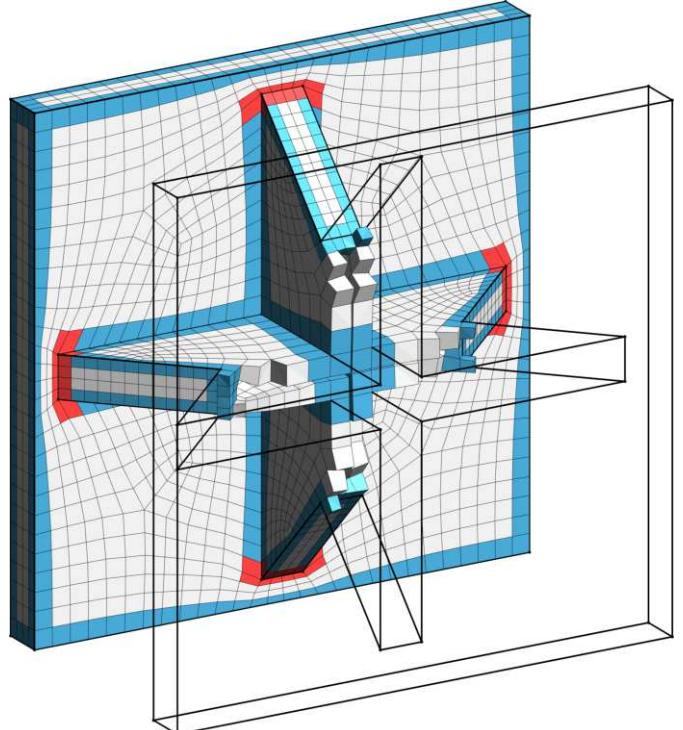
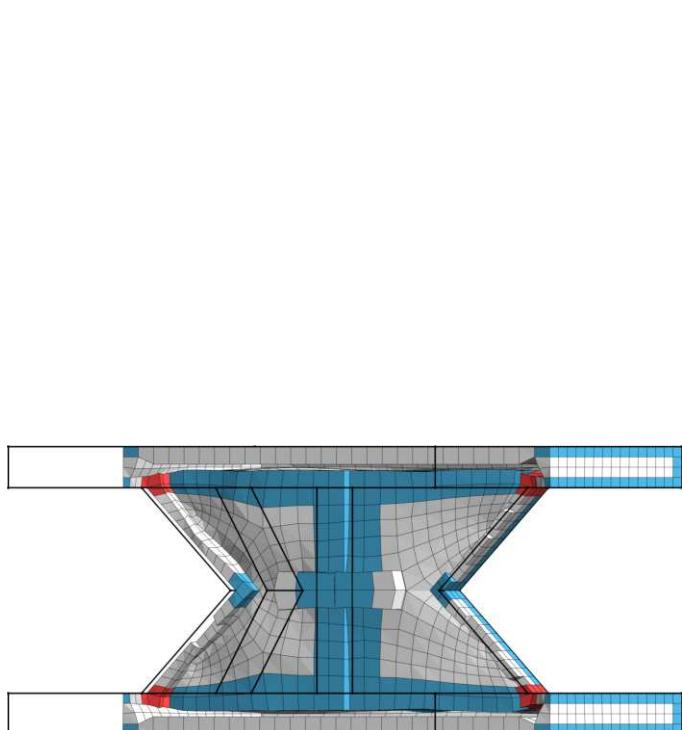
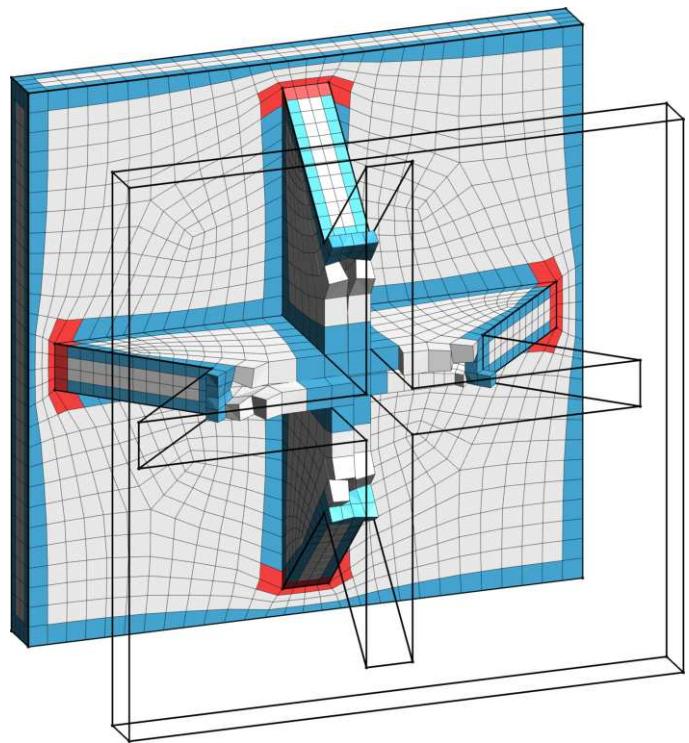
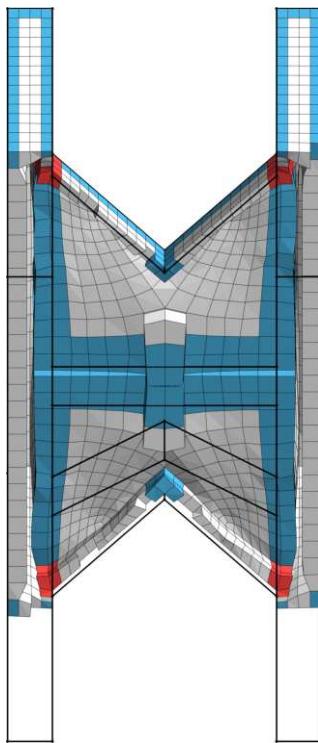
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1976	1470	0.530	0.90	0.93	16

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 3.72384s	11764	5880	464	-	-	0.340	0.78	0.78
Ours	0.117767s / 0.940889s	10996	5496	4	8	24	0.590	0.91	0.93

Figures:



Model: B37

CAD: 40 corners, 68 curves, 32 surfaces, 1 volume

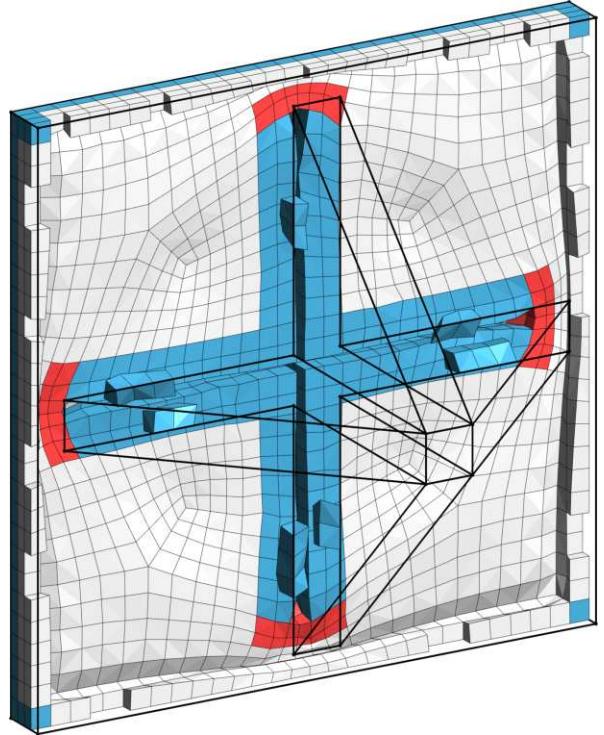
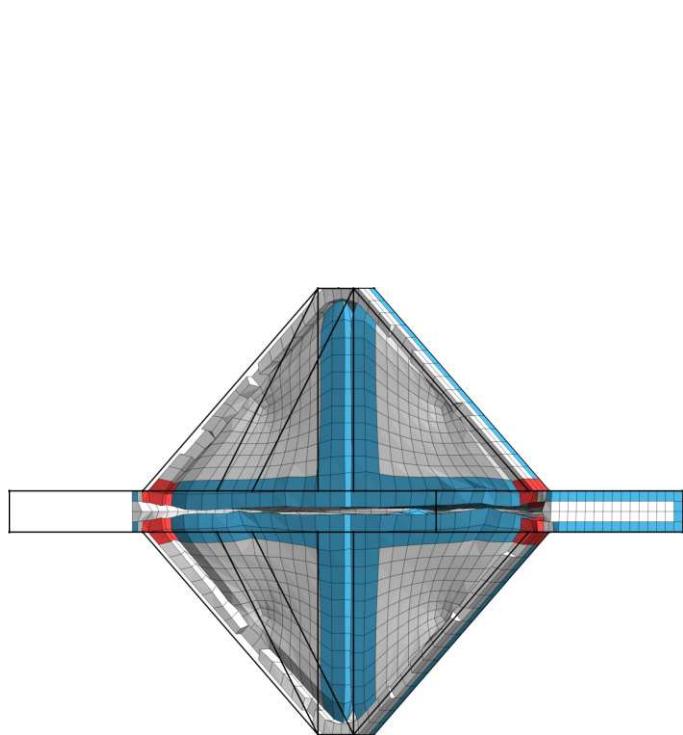
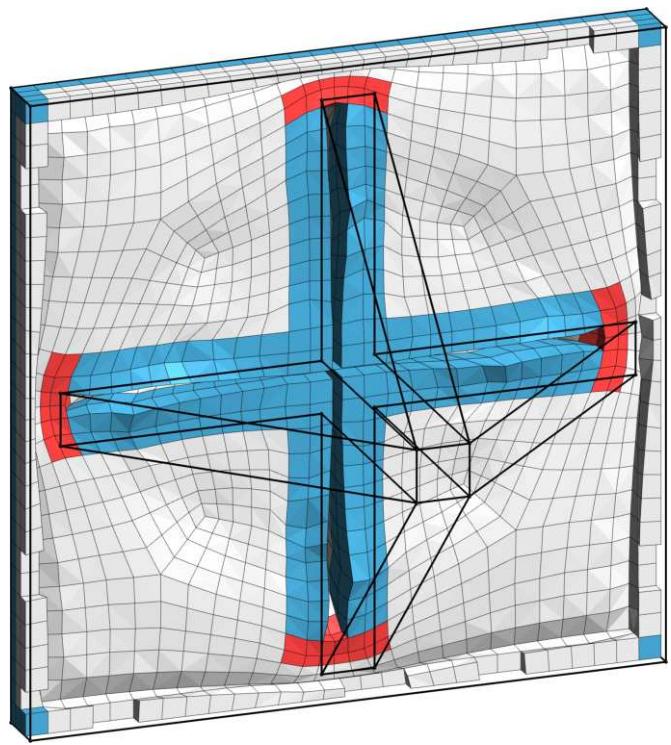
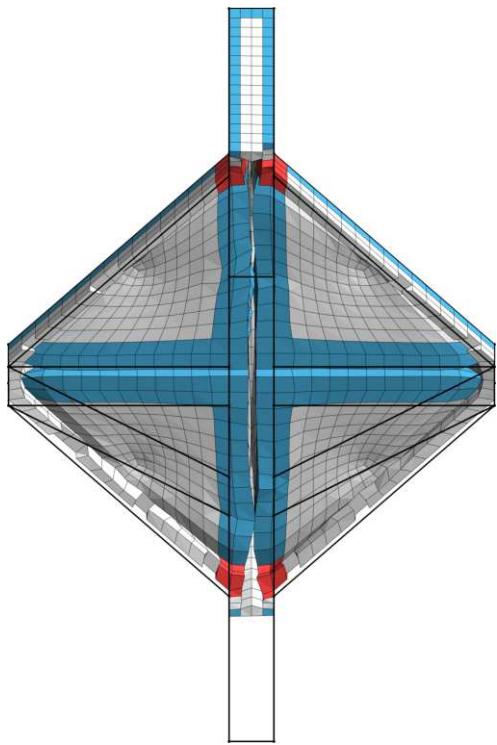
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1630	1176	0.528	0.82	0.85	16

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 2.42699s	9412	4704	392	-	-	0.361	0.71	0.72
Ours	11.9651s / 1.3705s	9036	4520	4	4	24	0.535	0.85	0.87

Figures:



Model: B38

CAD: 28 corners, 42 curves, 16 surfaces, 1 volume

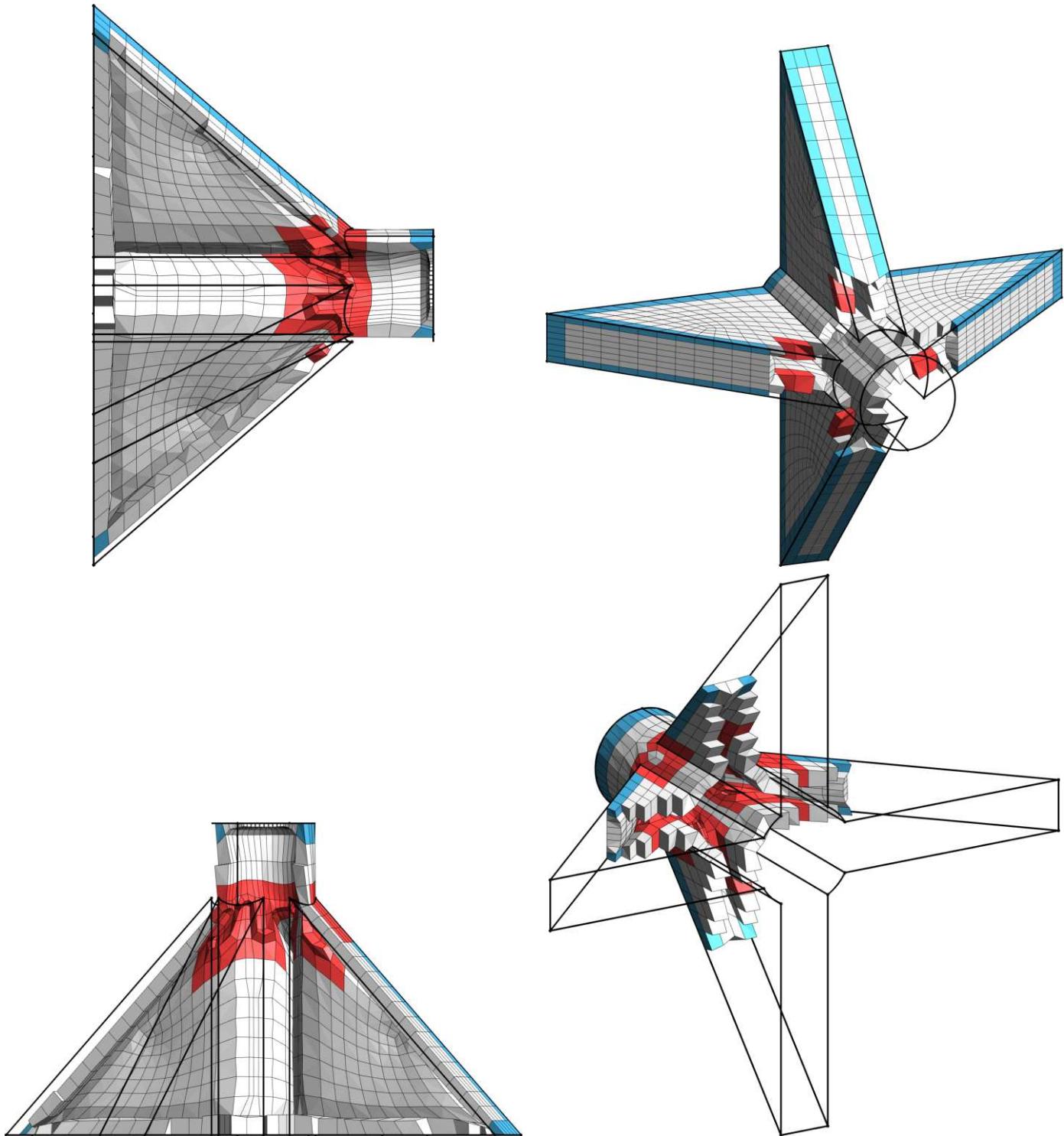
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
832	596	0.450	0.75	0.74	8

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 2.28078s	4772	2384	167.034	-	-	0.286	0.66	0.64
Ours	2.98965s / 0.759002s	4384	2188	34.7963	1	45	0.293	0.74	0.76

Figures:



Model: B39

CAD: 32 corners, 48 curves, 20 surfaces, 1 volume

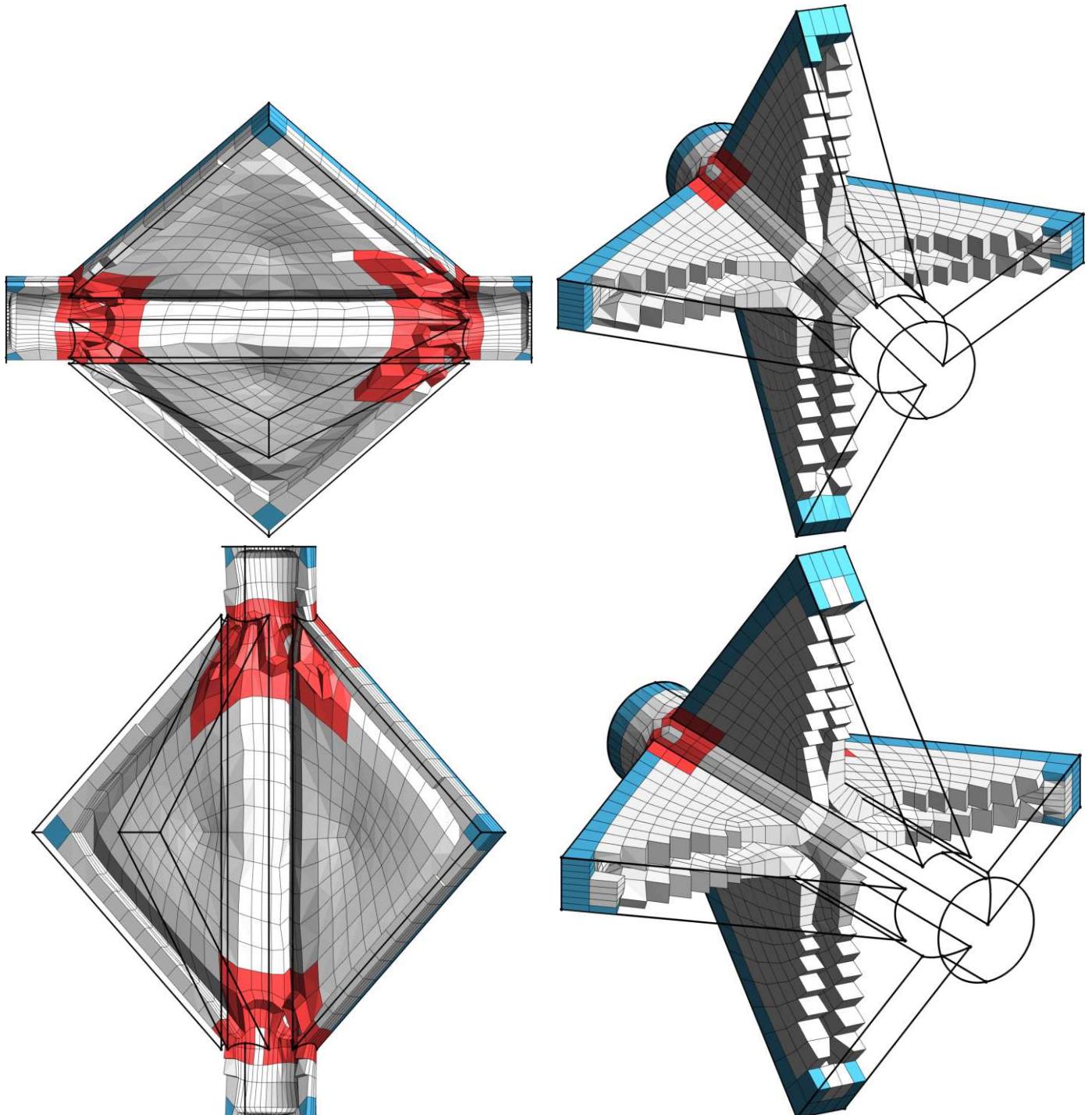
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1000	730	0.401	0.71	0.72	16

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 3.76983s	5844	2920	148.037	-	-	0.227	0.65	0.63
Ours	5.99833s / 1.65652s	5576	2788	47.7507	2	77	0.224	0.68	0.70

Figures:



Model: B3

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

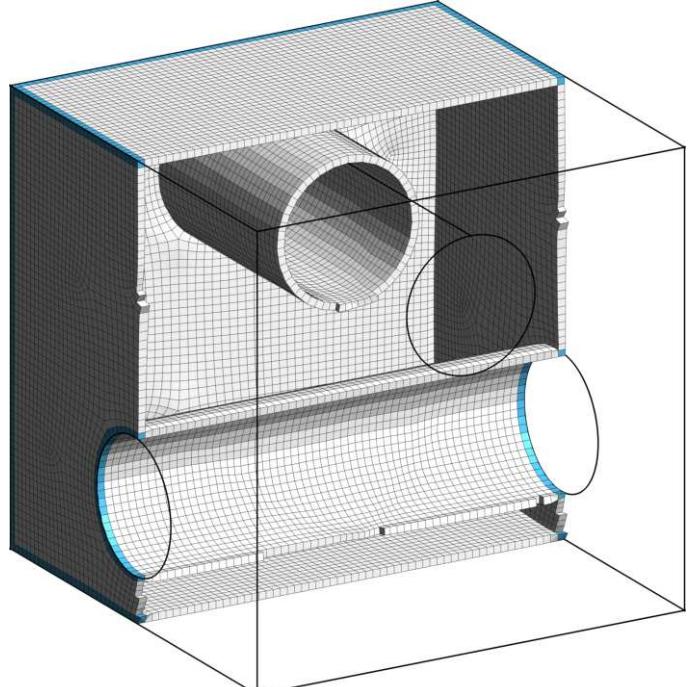
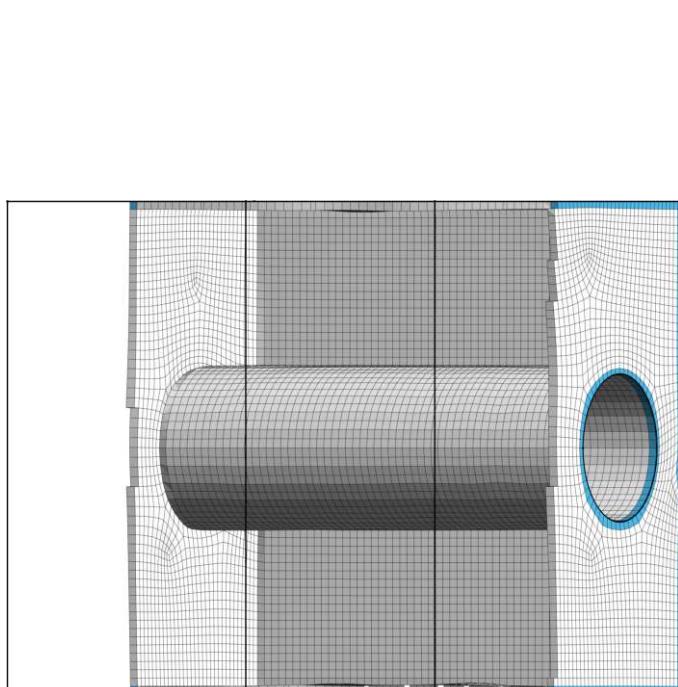
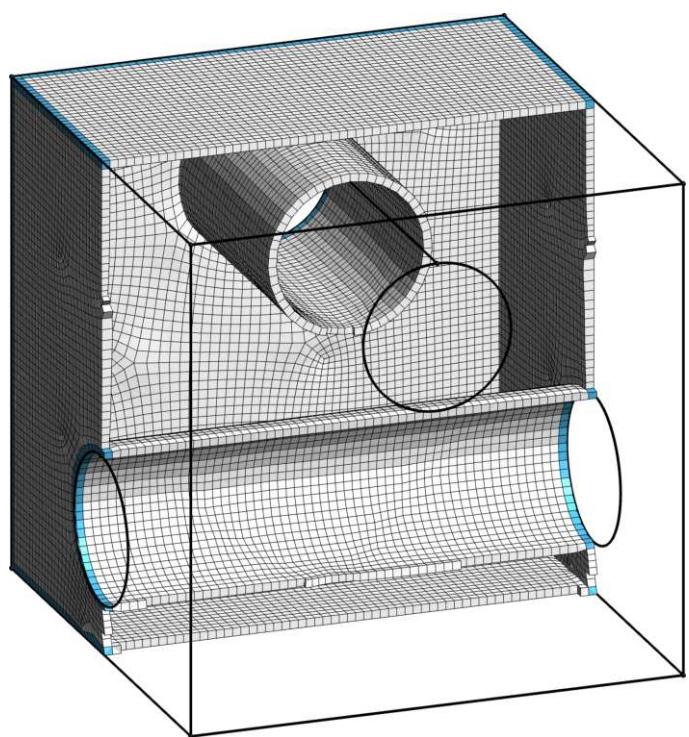
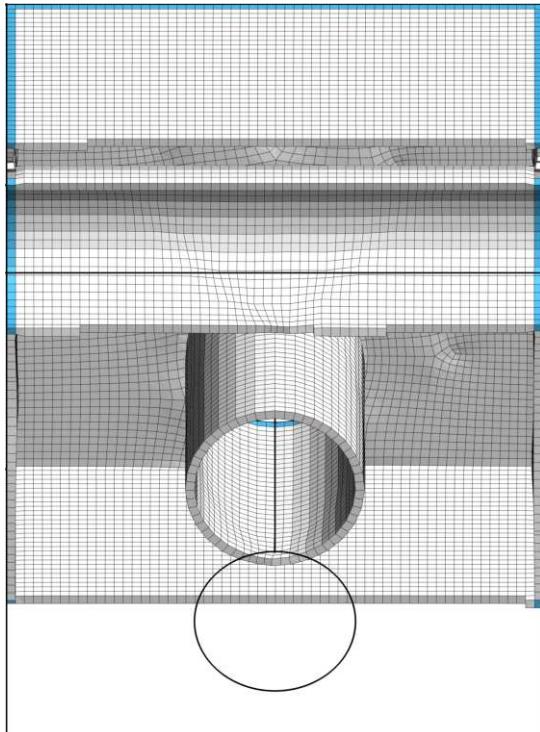
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
7334	6852	0.609	0.99	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 5.39795s	54812	27408	479.806	-	-	0.471	0.95	0.99
Ours	0.007239s / 1.27357s	52916	26456	0	0	0	0.617	0.99	0.99

Figures:



Model: B40

CAD: 64 corners, 96 curves, 36 surfaces, 1 volume

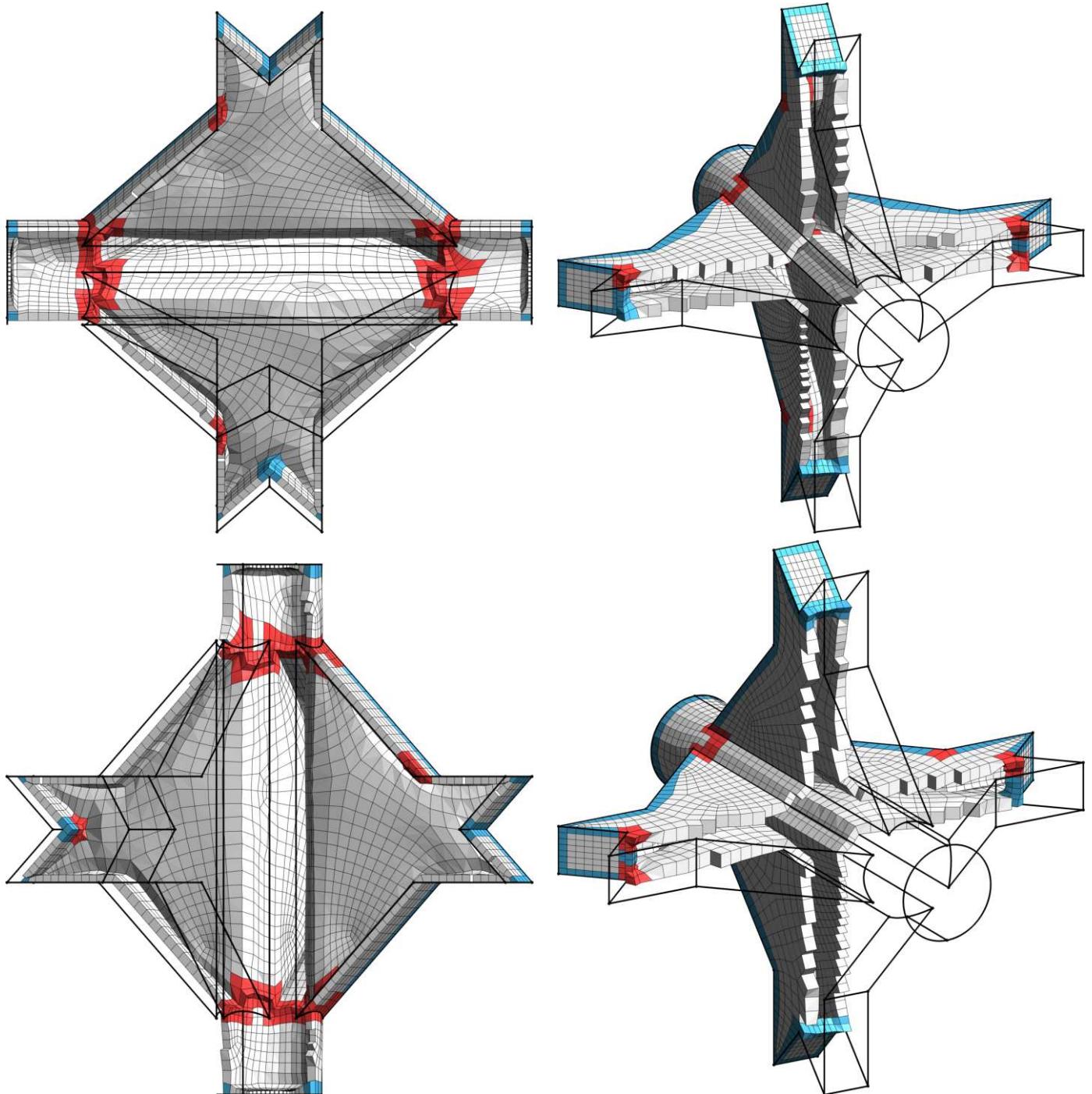
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2349	1737	0.331	0.87	0.90	22

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 4.51144s	13900	6948	415.728	-	-	0.246	0.77	0.81
Ours	6.22505s / 0.967264s	12942	6470	63.4745	6	100	0.249	0.85	0.88

Figures:



Model: B41

CAD: 50 corners, 76 curves, 28 surfaces, 1 volume

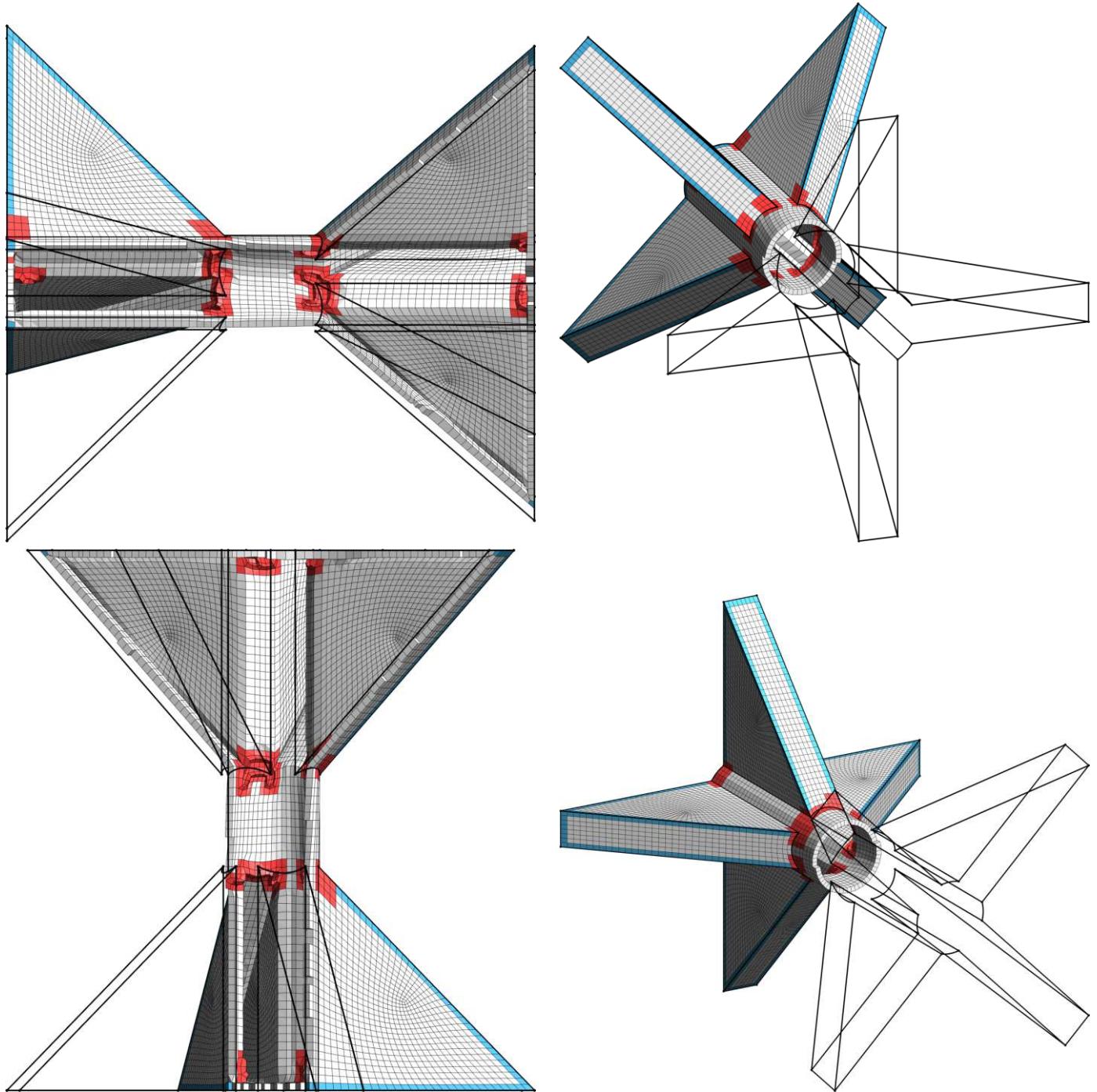
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
5083	4223	0.522	0.85	0.88	23

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 7.59866s	33788	16892	600	-	-	0.312	0.80	0.87
Ours	8.98646s / 1.65994s	32194	16096	123.332	3	143	0.314	0.86	0.89

Figures:



Model: B42

CAD: 12 corners, 18 curves, 10 surfaces, 1 volume

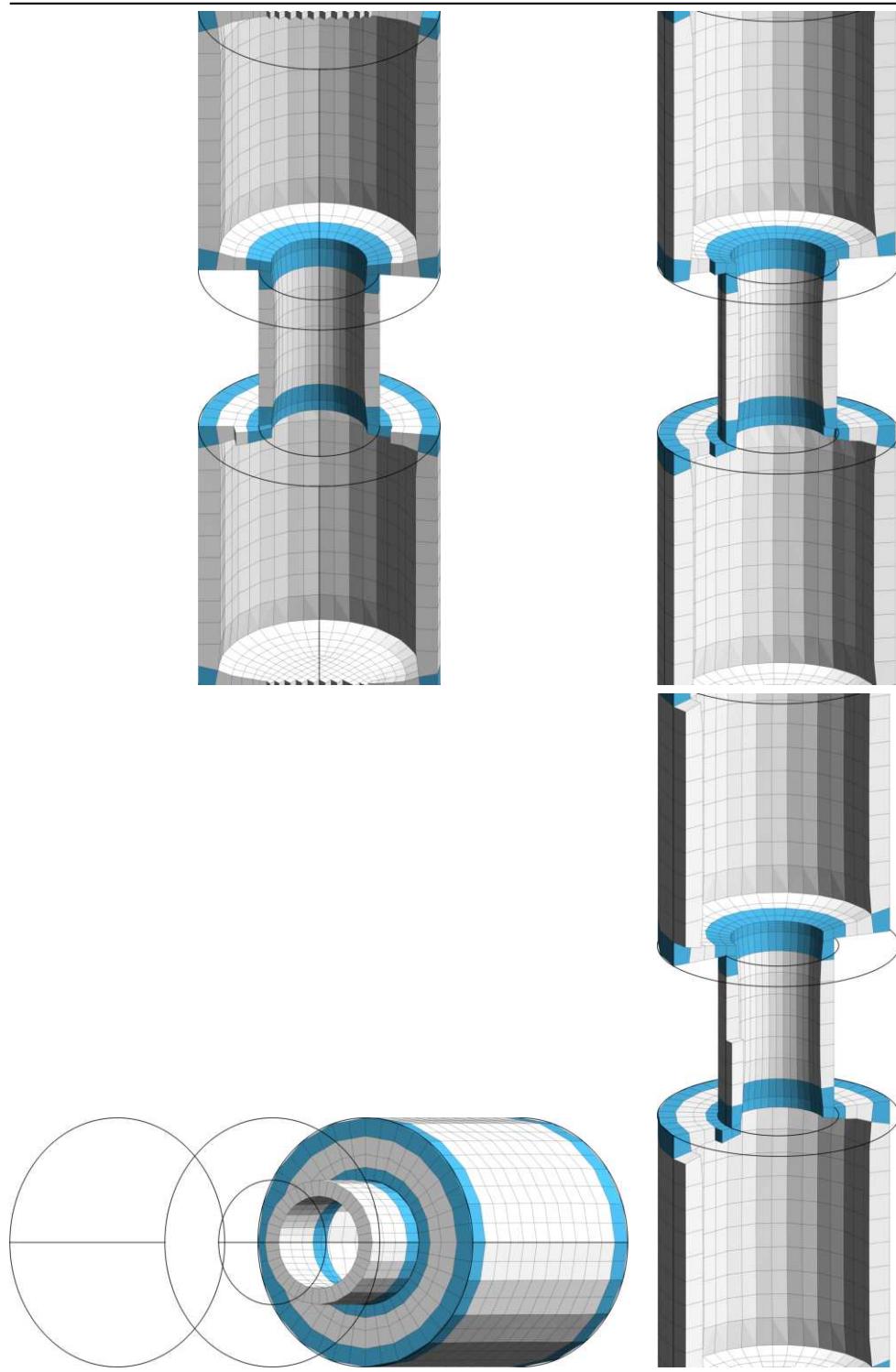
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
730	570	0.656	0.92	0.95	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.38866s	4564	2280	120.039	-	-	0.567	0.83	0.90
Ours	0.001158s / 0.242394s	4404	2200	0	0	0	0.638	0.89	0.91

Figures:



Model: B43

CAD: 20 corners, 30 curves, 16 surfaces, 1 volume

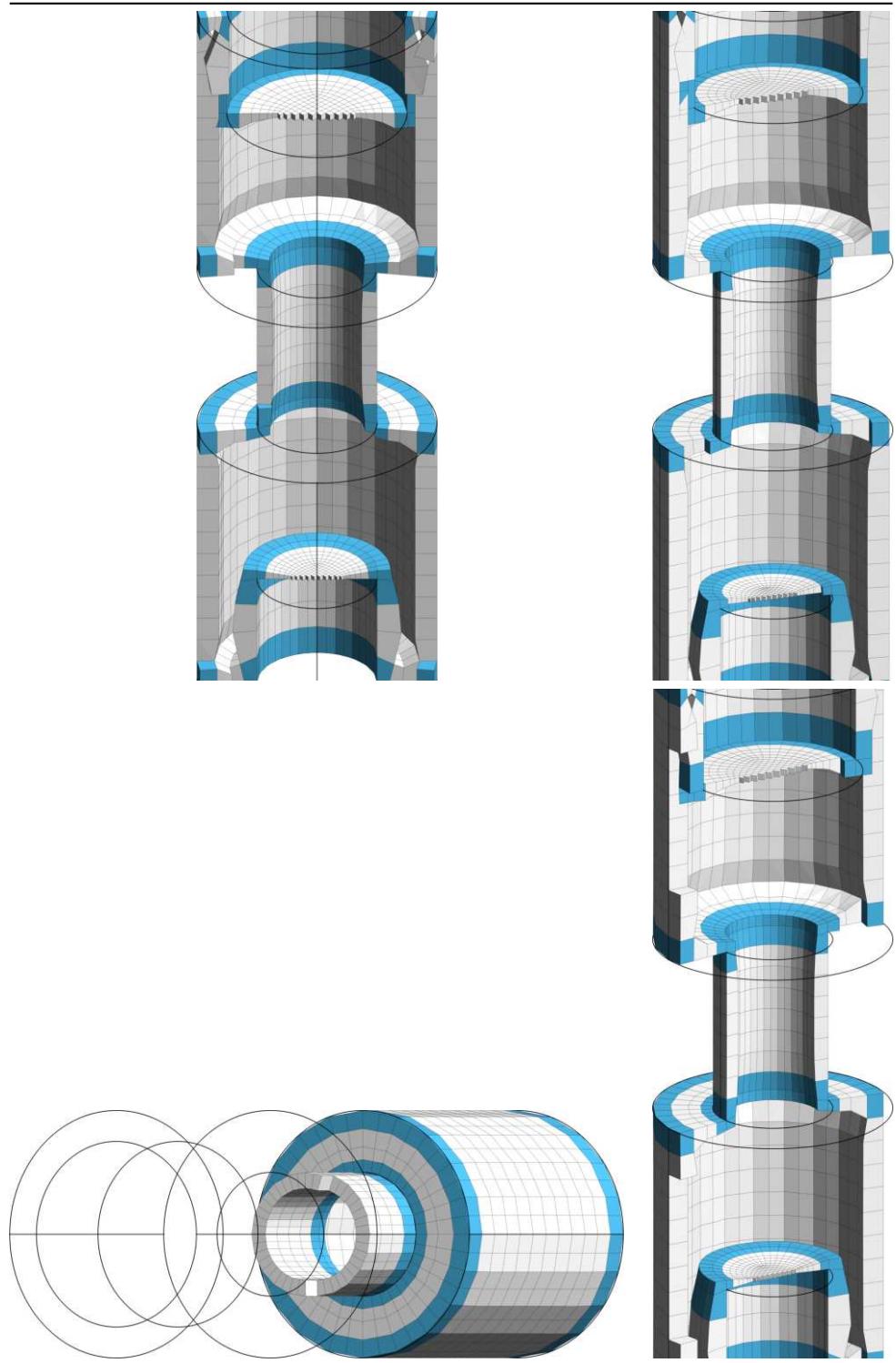
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
982	730	0.532	0.88	0.94	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.714518s	5844	2920	199.931	-	-	0.401	0.78	0.85
Ours	0.00074s / 0.388649s	5684	2840	0	0	0	0.531	0.84	0.90

Figures:



Model: B44

CAD: 28 corners, 43 curves, 16 surfaces, 1 volume

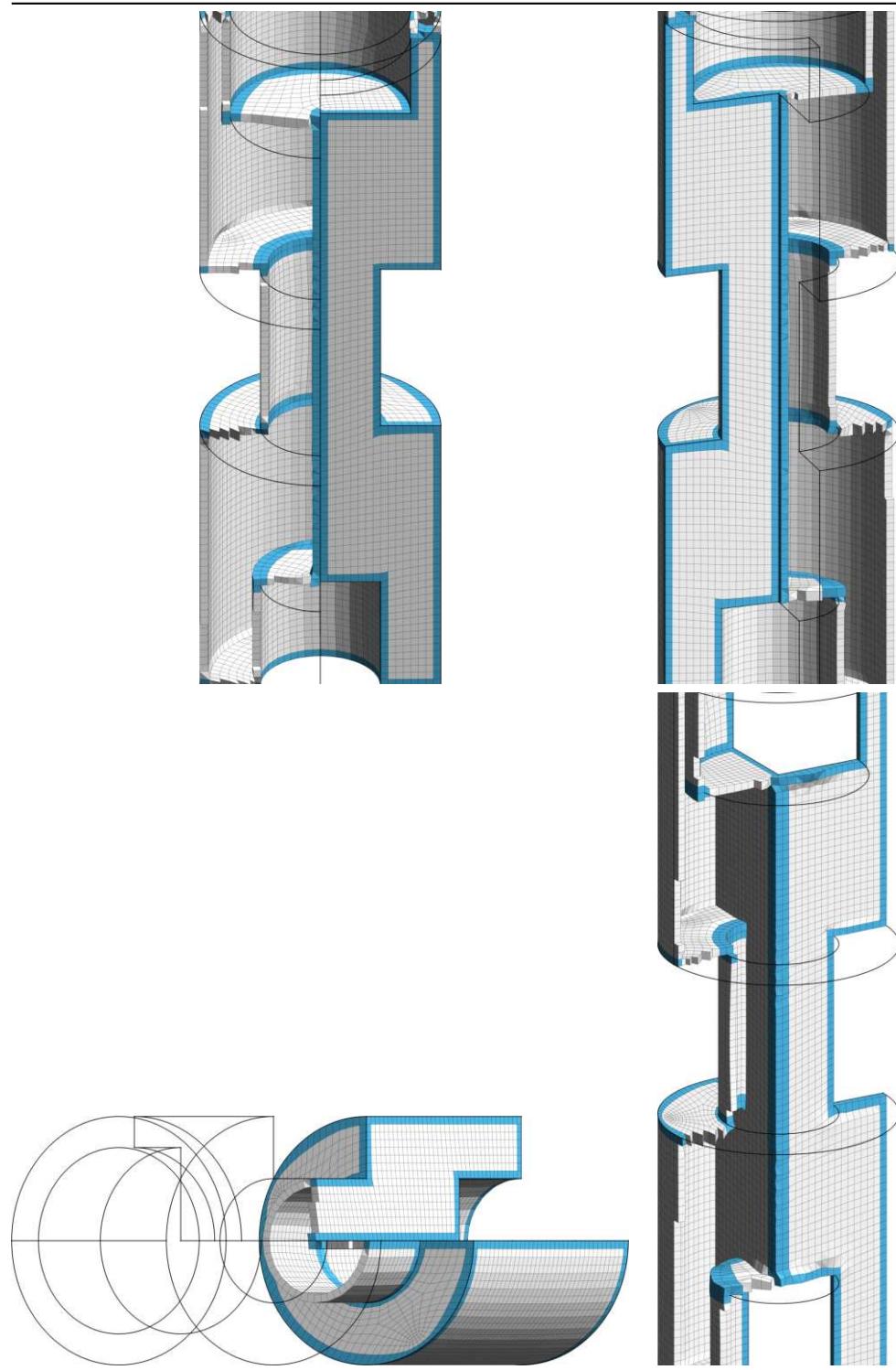
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
3700	3131	0.174	0.95	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 4.25419s	25048	12524	528.814	-	-	0.081	0.89	0.98
Ours	0.003614s / 0.925576s	23902	11954	0	0	0	0.175	0.95	0.99

Figures:



Model: B45

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

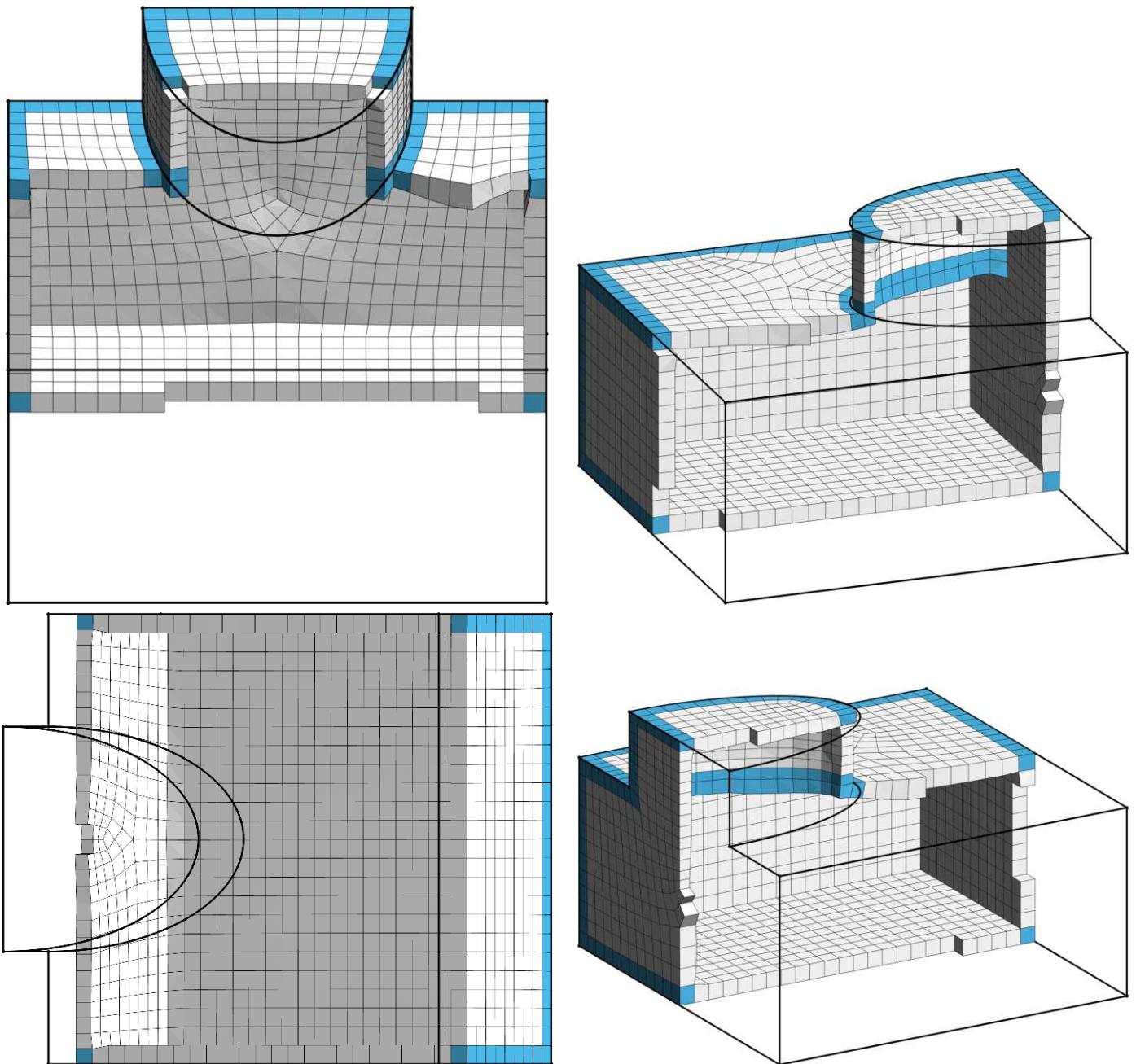
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
826	660	0.687	0.96	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.931823s	5284	2640	158.451	-	-	0.497	0.87	0.92
Ours	0.000859s / 0.154496s	4788	2388	0	0	0	0.678	0.97	0.99

Figures:



Model: B46

CAD: 16 corners, 24 curves, 10 surfaces, 1 volume

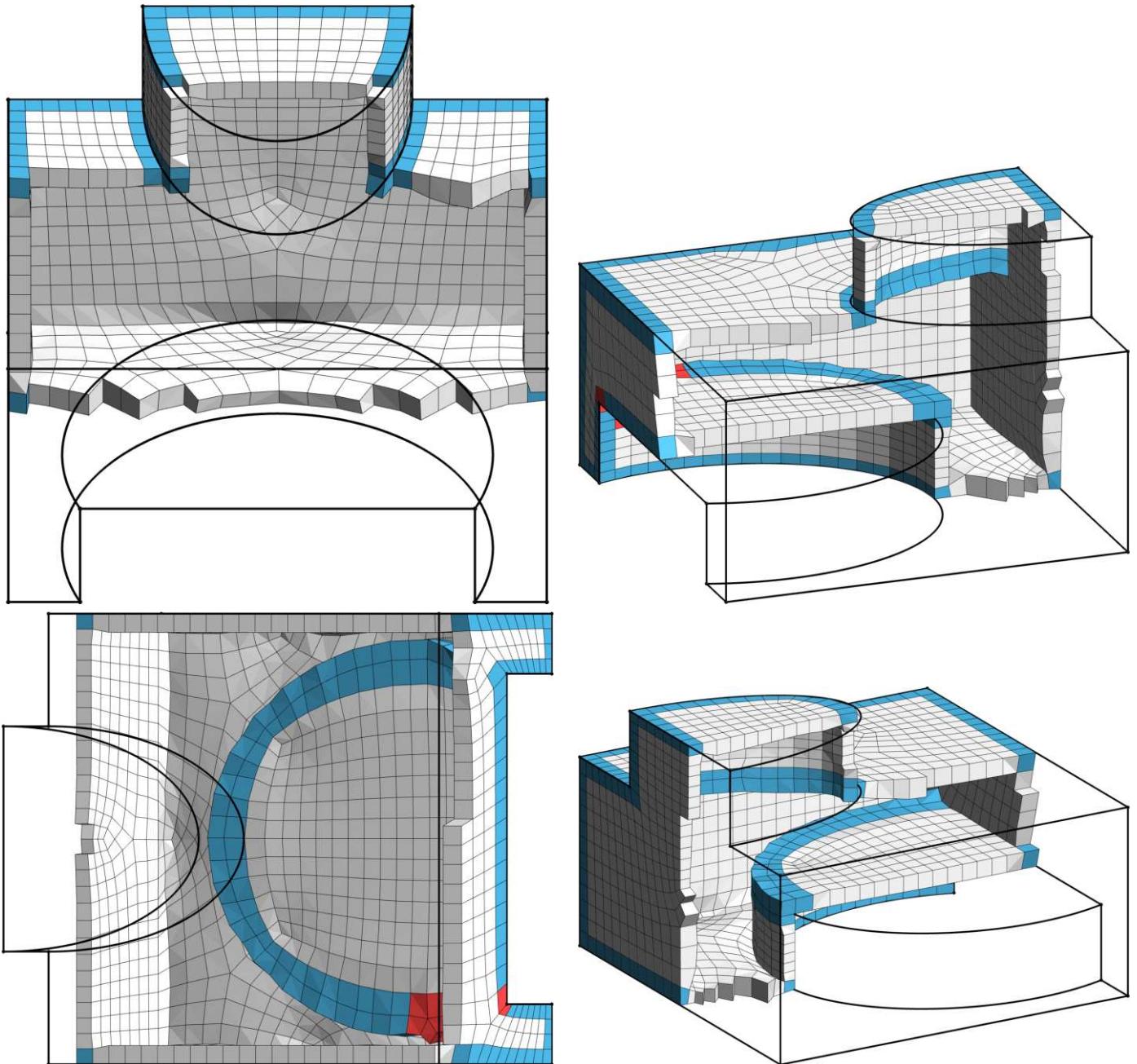
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
929	713	0.416	0.92	0.95	1

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.68326s	5708	2852	209.303	-	-	0.281	0.81	0.85
Ours	0.005886s / 0.226558s	5194	2590	3.63883	1	5	0.430	0.92	0.95

Figures:



Model: B47

CAD: 24 corners, 36 curves, 15 surfaces, 1 volume

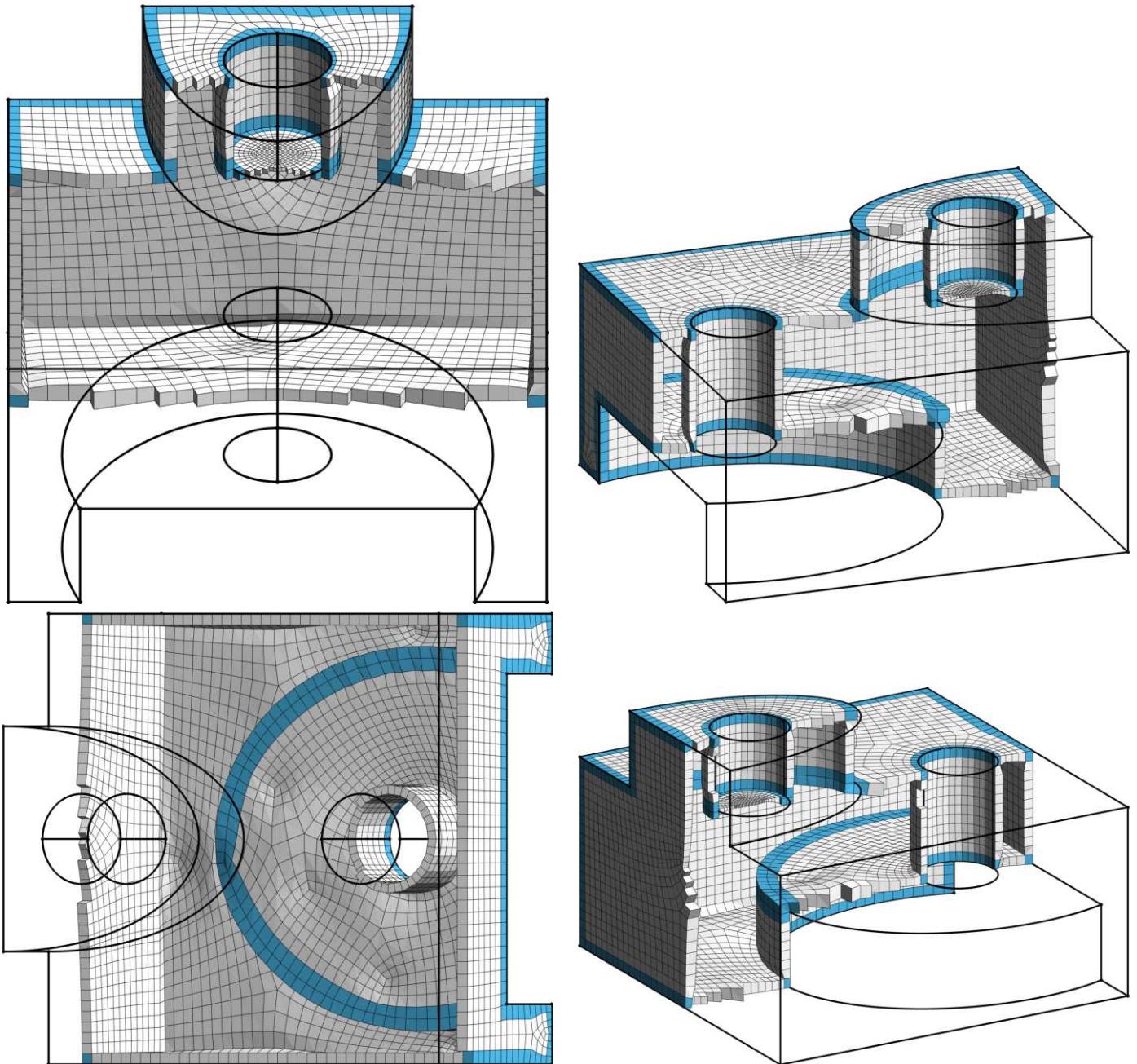
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2522	2082	0.166	0.94	0.98	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 2.9574s	16656	8328	411.577	-	-	0.080	0.87	0.92
Ours	0.002337s / 0.498542s	15656	7824	0	0	0	0.170	0.95	0.97

Figures:



Model: B48

CAD: 14 corners, 27 curves, 15 surfaces, 1 volume

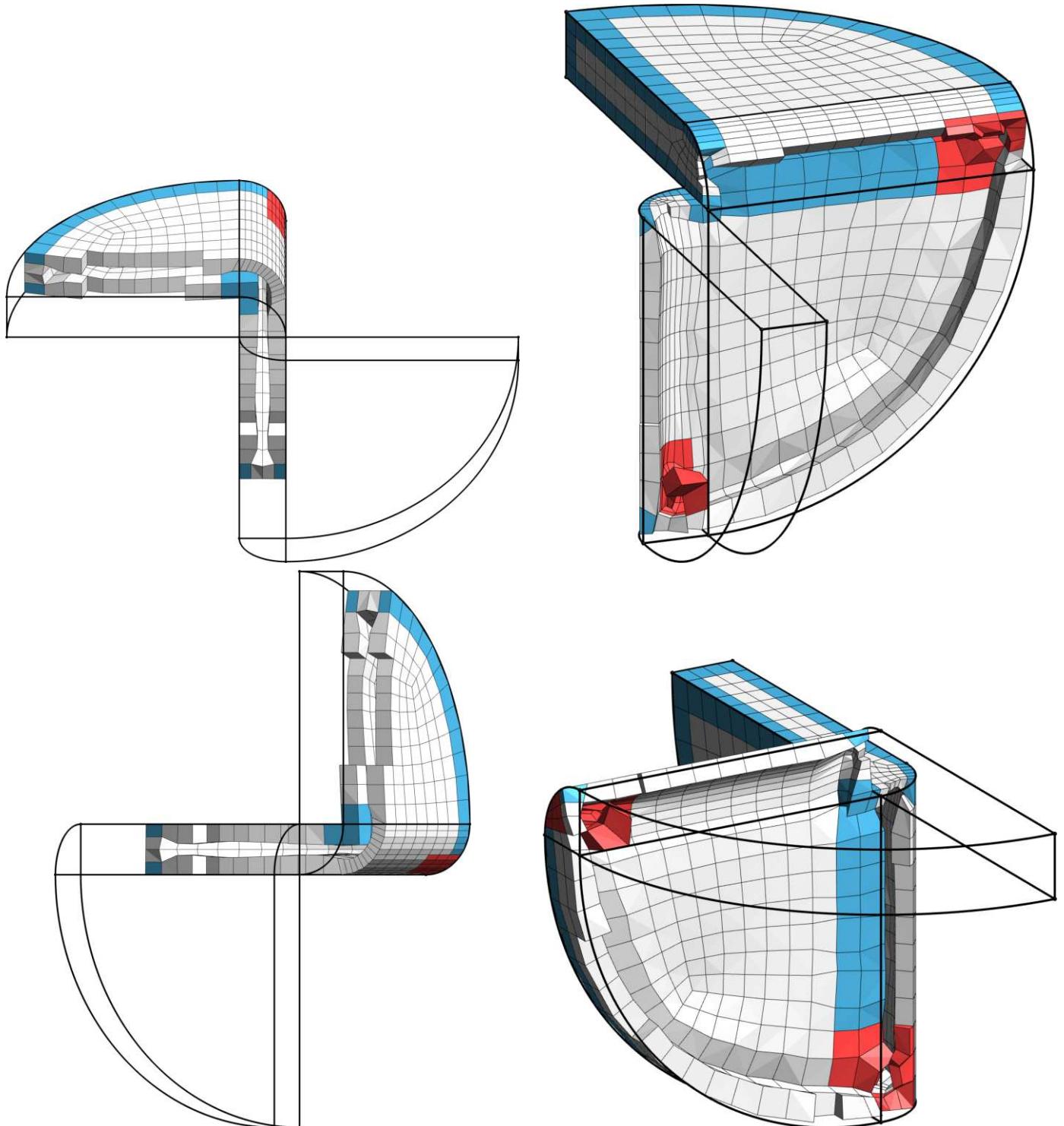
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
531	370	0.258	0.83	0.88	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 26.3718s	2964	1480	114.524	-	-	-0.00	0.70	0.66
Ours	0.022564s / 0.380021s	2674	1338	19.4375	2	18	0.151	0.80	0.84

Figures:



Model: B49

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

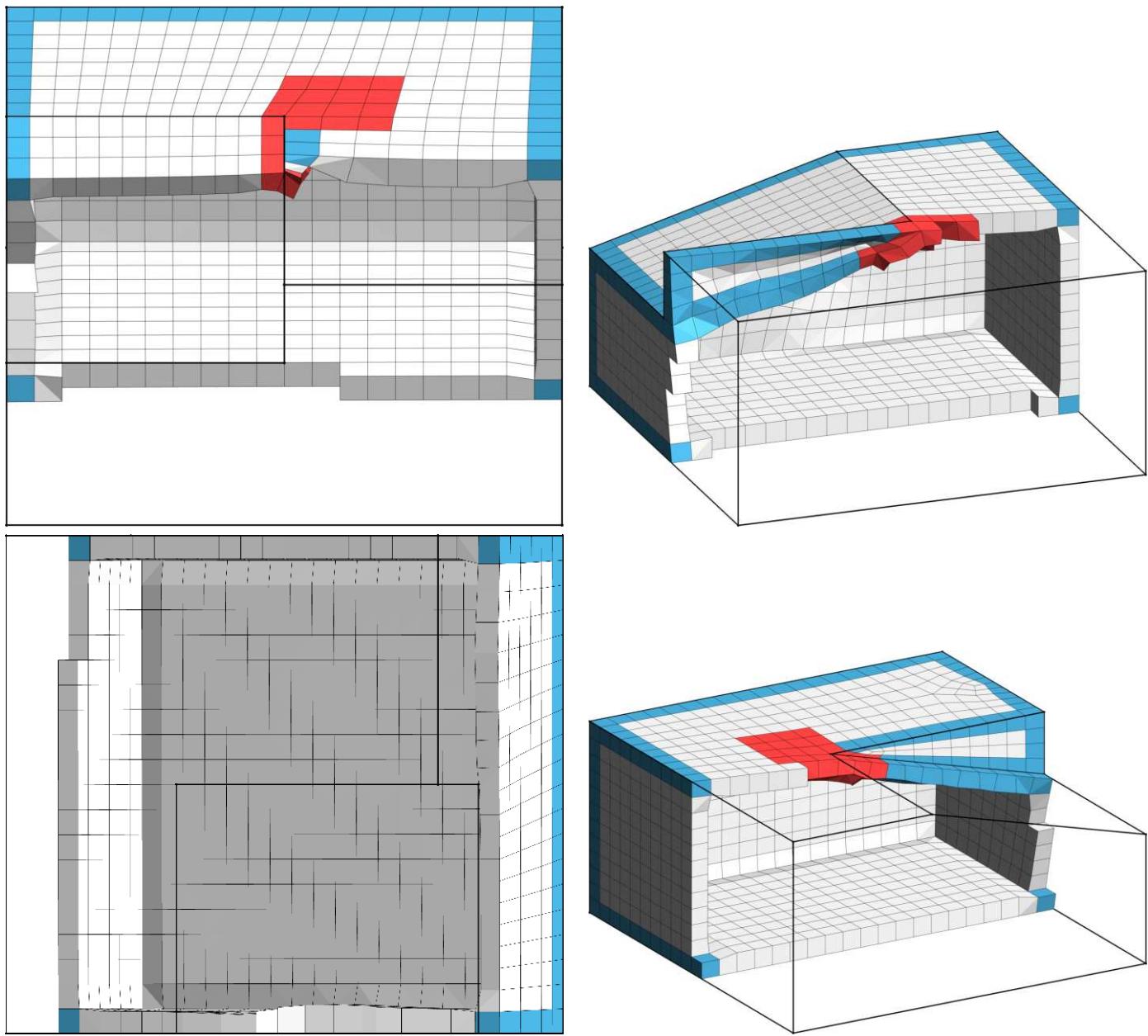
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
568	436	0.258	0.96	0.98	1

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.720231s	3492	1744	116.167	-	-	0.176	0.85	0.93
Ours	0.019599s / 0.09637s	3112	1550	5	1	5	0.254	0.96	0.98

Figures:



Model: B4

CAD: 4 corners, 6 curves, 5 surfaces, 1 volume

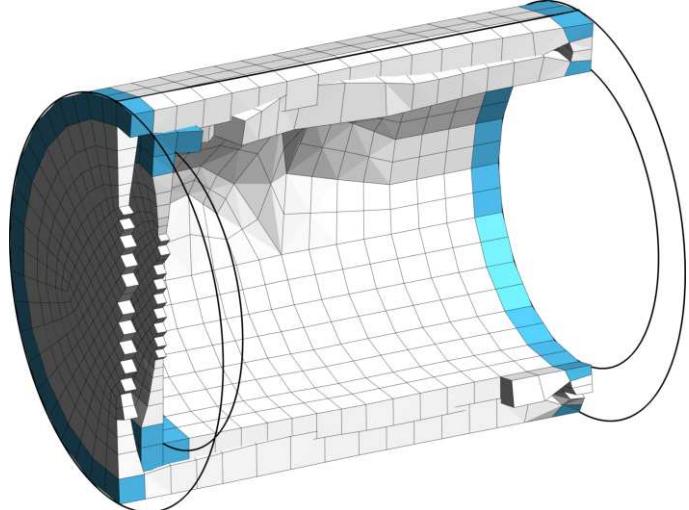
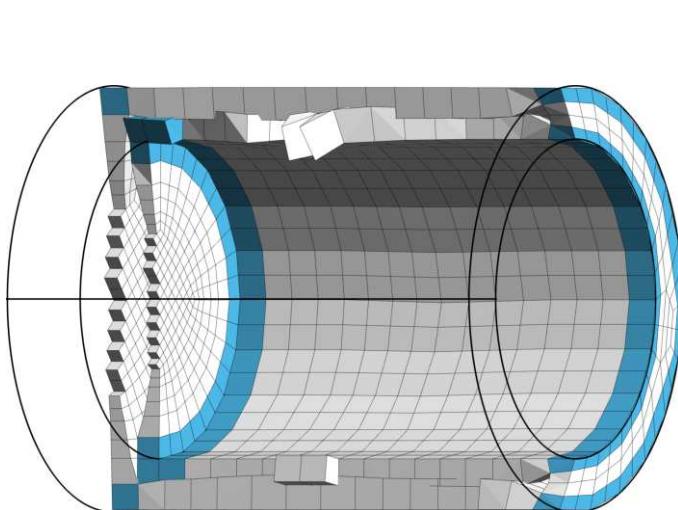
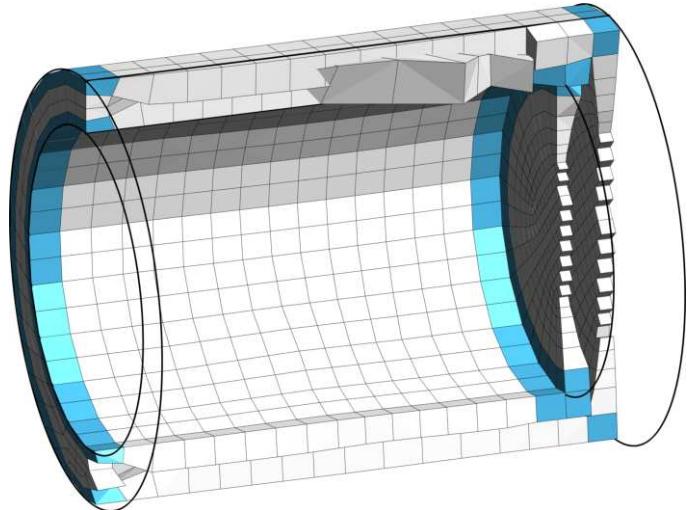
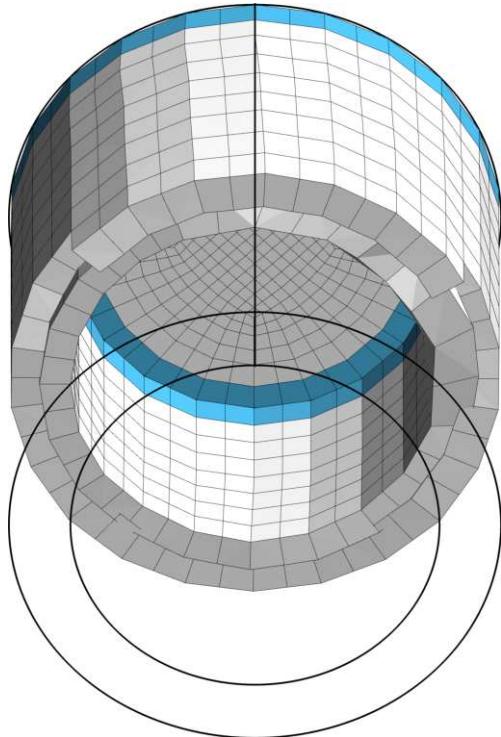
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
638	552	0.371	0.93	0.97	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.586596s	4420	2208	84.4098	-	-	0.063	0.86	0.96
Ours	0.000741s / 0.177836s	4244	2120	0	0	0	0.063	0.92	0.96

Figures:



Model: B50

CAD: 14 corners, 21 curves, 9 surfaces, 1 volume

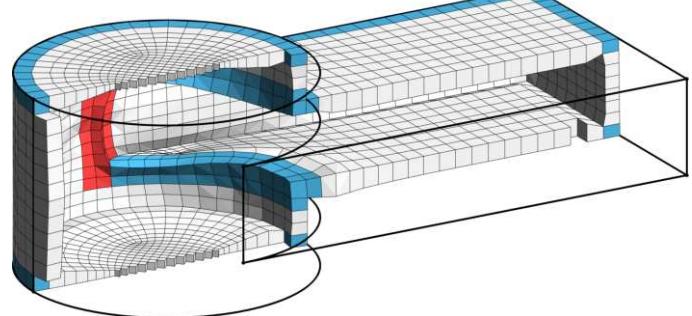
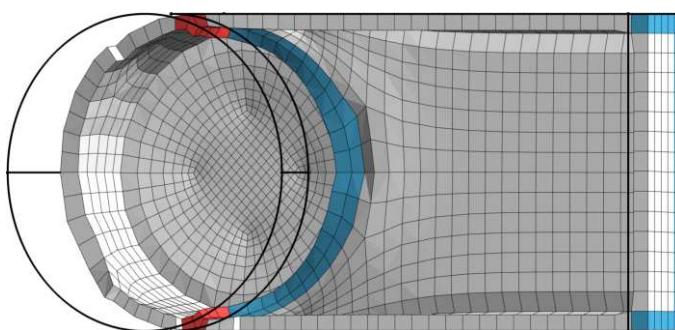
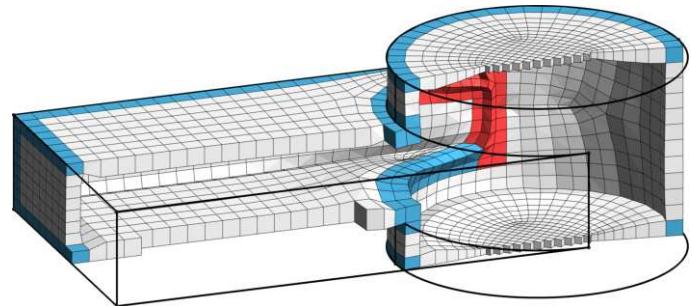
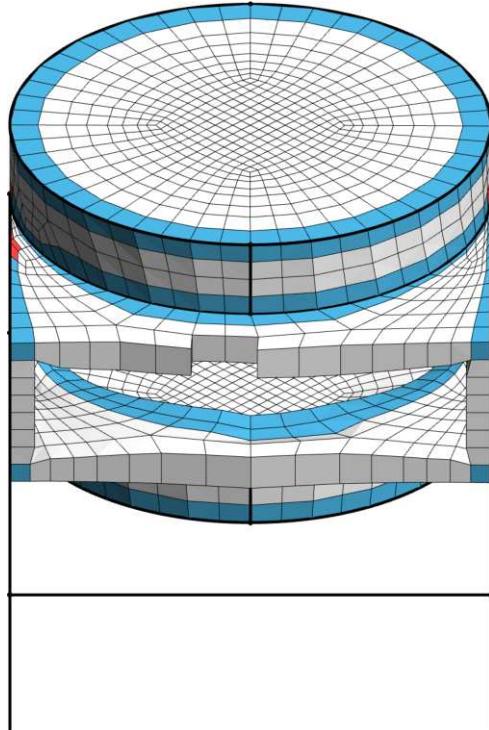
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
937	756	0.085	0.90	0.96	5

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 3.51417s	6052	3024	154.326	-	-	-0.21	0.82	0.92
Ours	3.56774s / 0.59697s	5688	2842	12.2766	2	13	0.066	0.90	0.95

Figures:



Model: B51

CAD: 18 corners, 27 curves, 11 surfaces, 1 volume

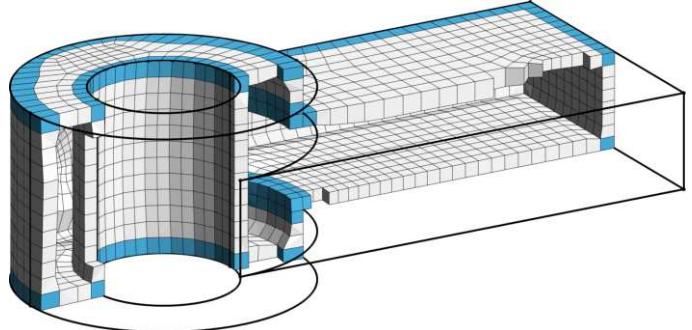
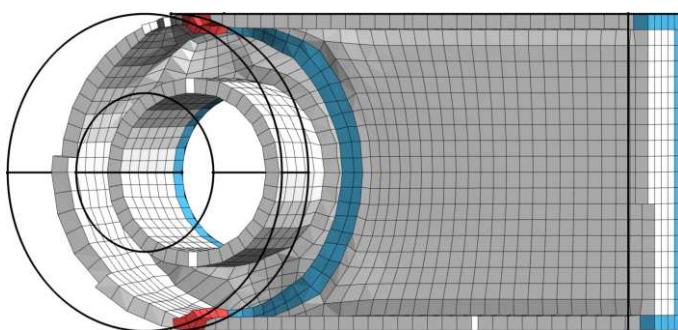
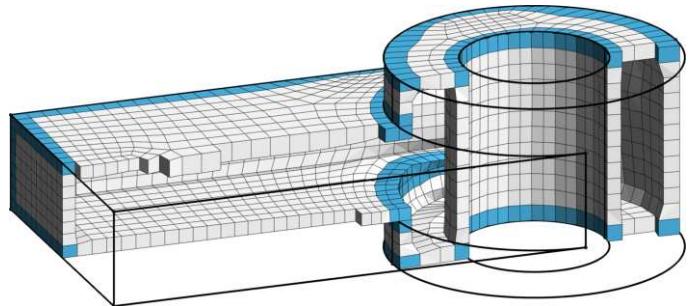
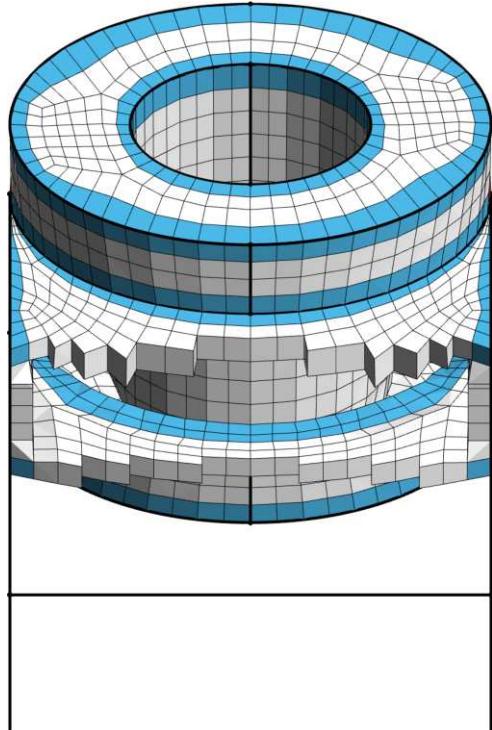
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1082	823	0.081	0.90	0.94	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 2.38575s	6584	3292	220.235	-	-	0.045	0.81	0.86
Ours	1.18331s / 0.403659s	5992	2996	9.12181	2	10	0.062	0.90	0.95

Figures:



Model: B52

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

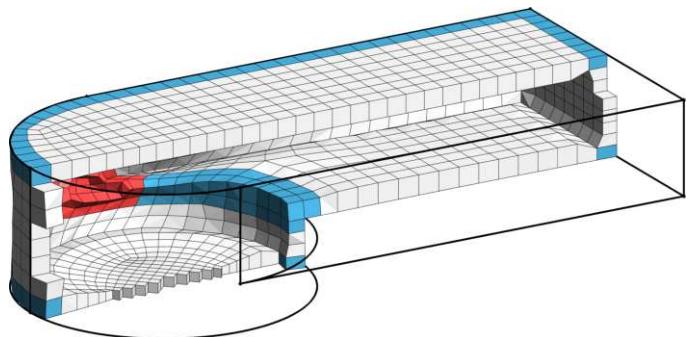
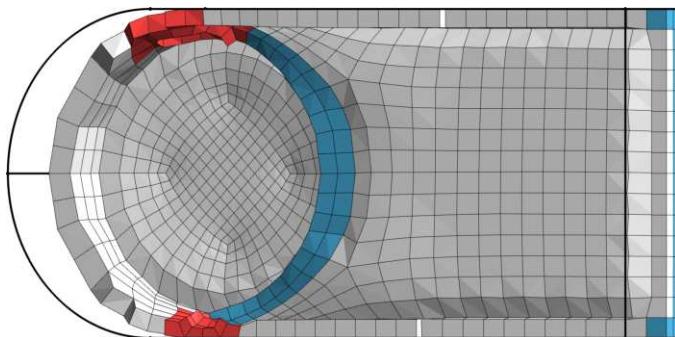
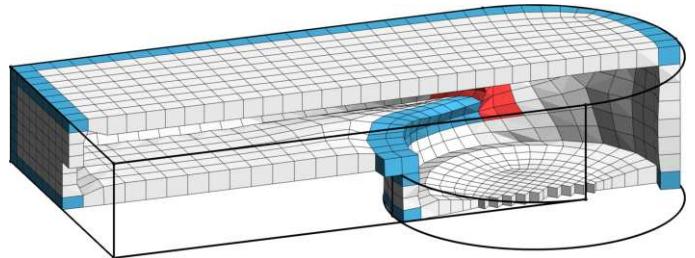
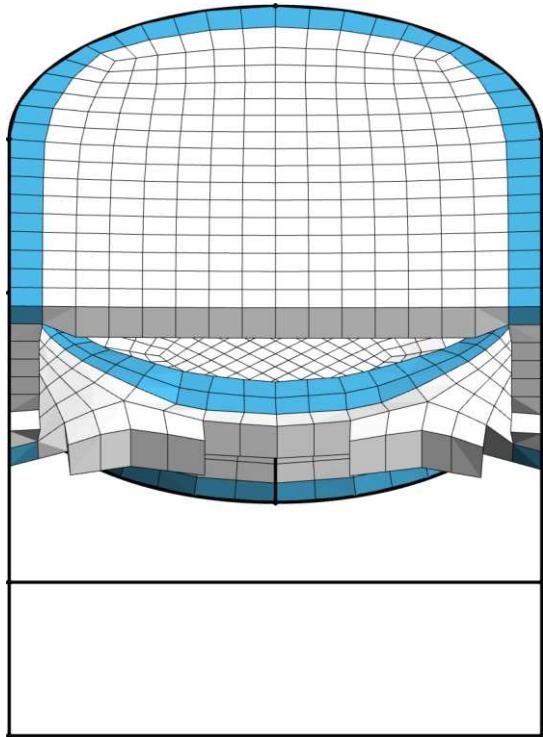
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
631	493	0.098	0.90	0.95	2

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.45436s	3948	1972	115.079	-	-	0.055	0.80	0.85
Ours	0.039819s / 0.232502s	3632	1812	10.585	2	10	0.077	0.89	0.91

Figures:



Model: B53

CAD: 16 corners, 24 curves, 10 surfaces, 1 volume

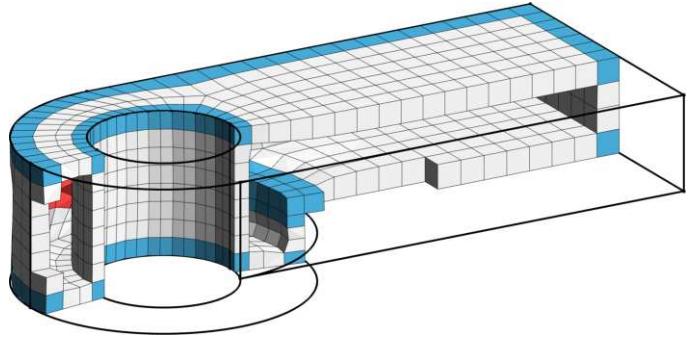
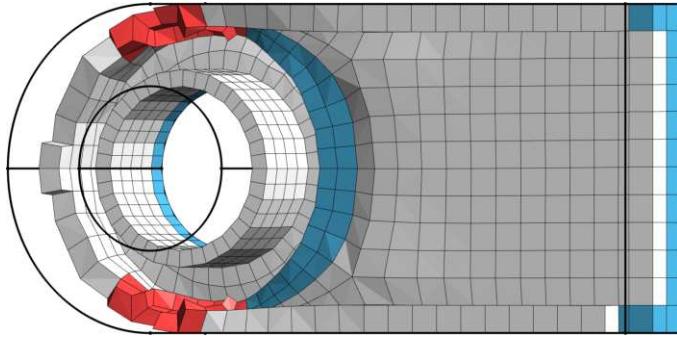
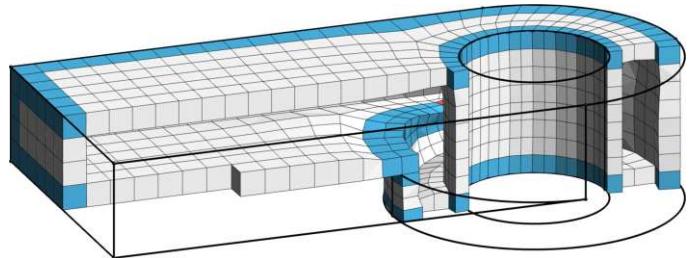
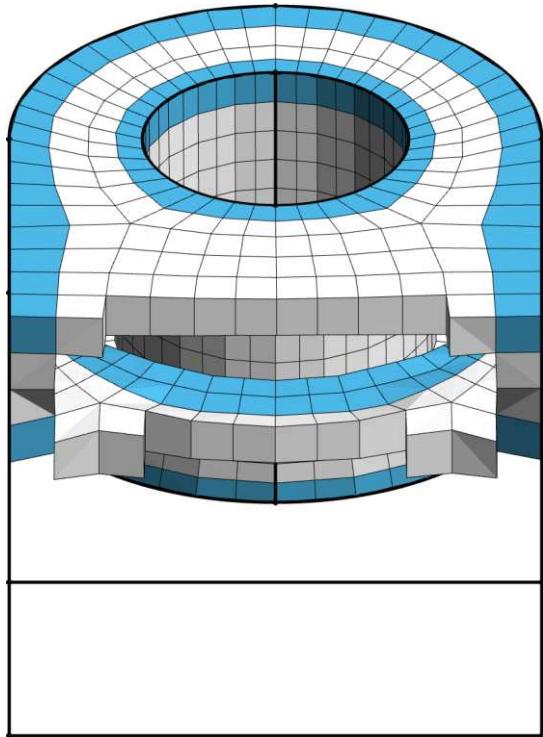
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
538	372	0.114	0.90	0.94	2

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.27746s	2976	1488	139.308	-	-	0.067	0.78	0.84
Ours	0.029949s / 0.231384s	2570	1282	10.5321	2	10	0.096	0.90	0.92

Figures:



Model: B54

CAD: 8 corners, 12 curves, 6 surfaces, 1 volume

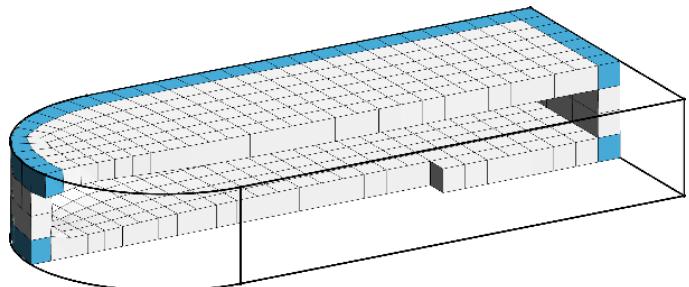
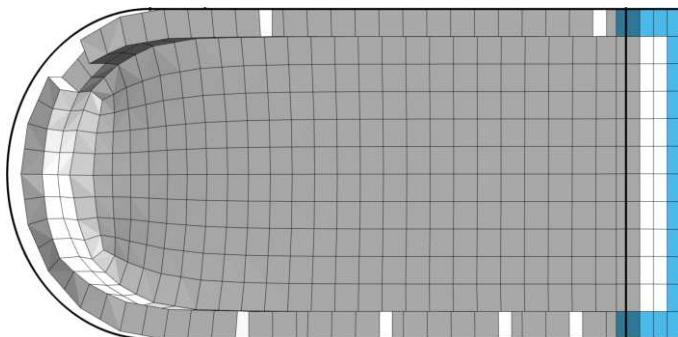
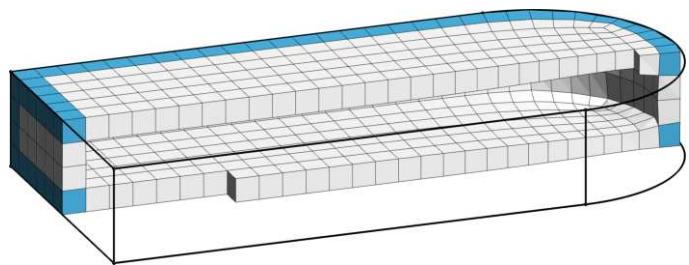
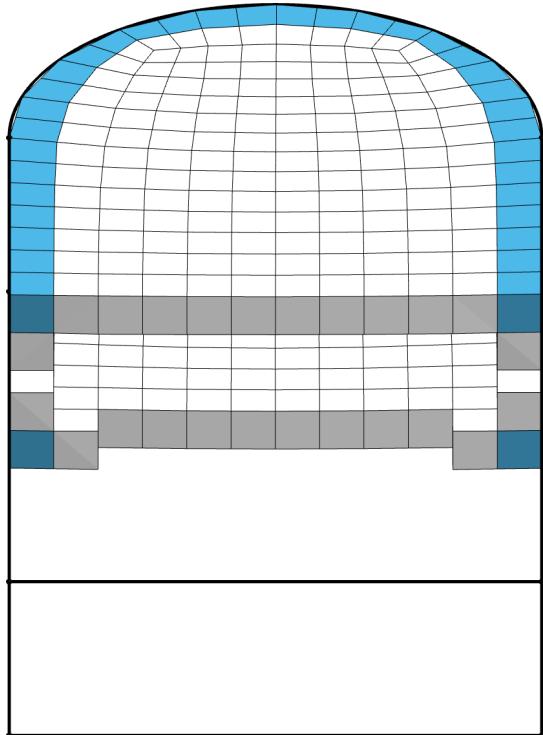
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
322	236	0.849	0.98	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.567707s	1892	944	75.933	-	-	0.601	0.85	0.87
Ours	0.000373s / 0.046635s	1600	796	0	0	0	0.833	0.98	0.99

Figures:



Model: B55

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

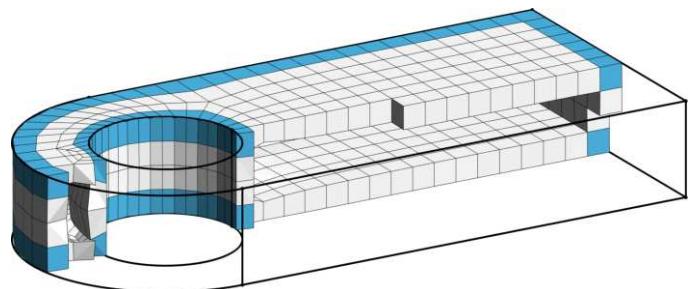
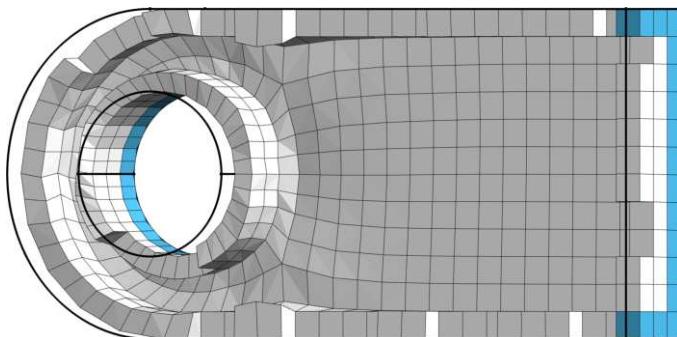
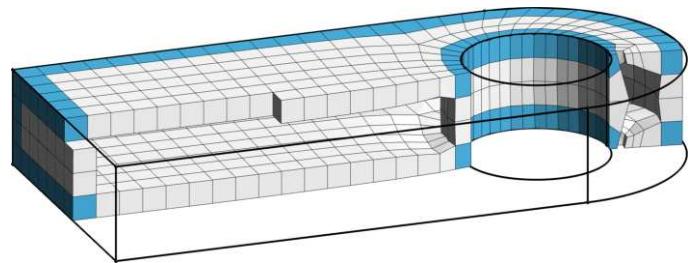
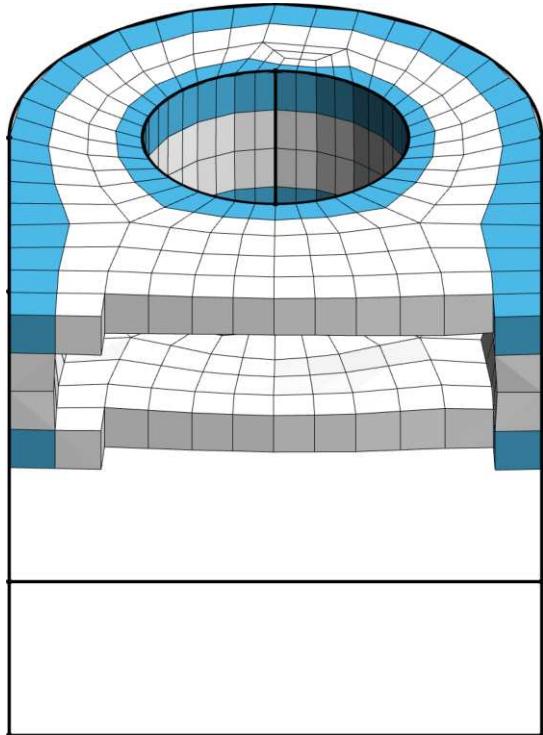
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
408	278	0.539	0.90	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.790796s	2224	1112	115.988	-	-	0.524	0.79	0.79
Ours	0.0004s / 0.088327s	1772	884	0	0	0	0.548	0.90	0.97

Figures:



Model: B56

CAD: 14 corners, 21 curves, 9 surfaces, 1 volume

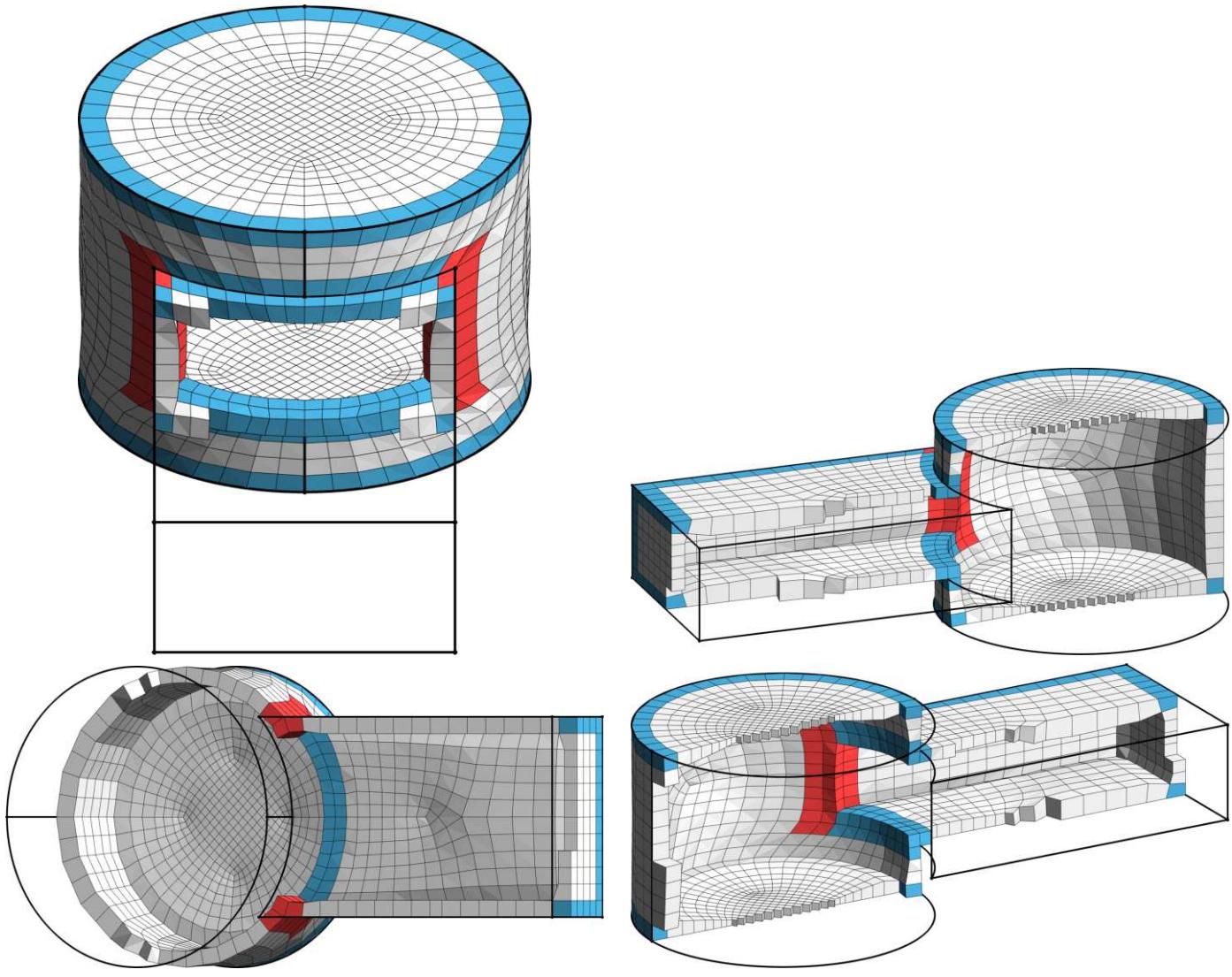
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
755	612	0.596	0.92	0.95	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.885581s	4900	2448	117.737	-	-	0.390	0.85	0.91
Ours	0.217313s / 0.218612s	4596	2296	2.60679	2	10	0.654	0.93	0.95

Figures:



Model: B57

CAD: 29 corners, 43 curves, 21 surfaces, 1 volume

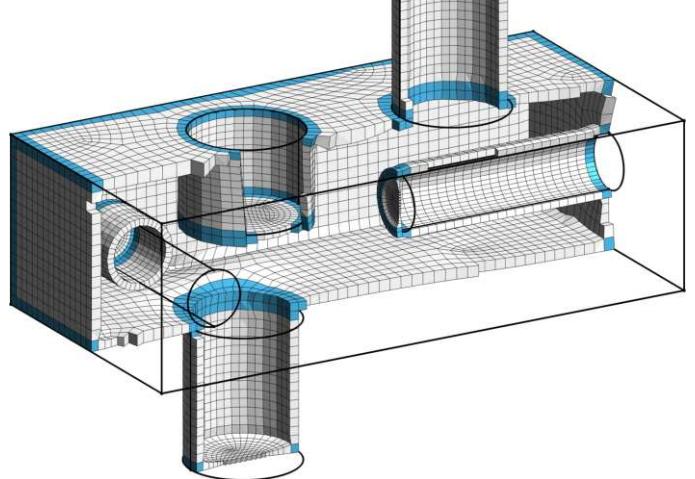
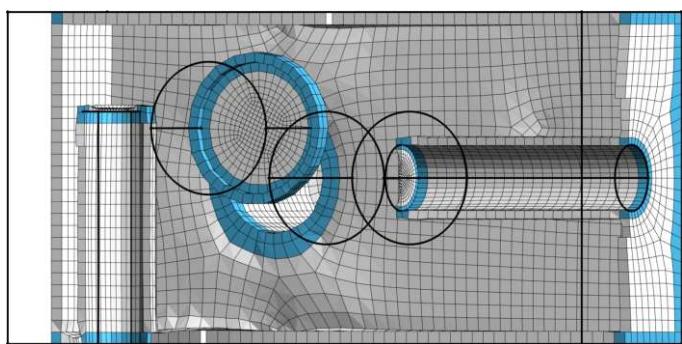
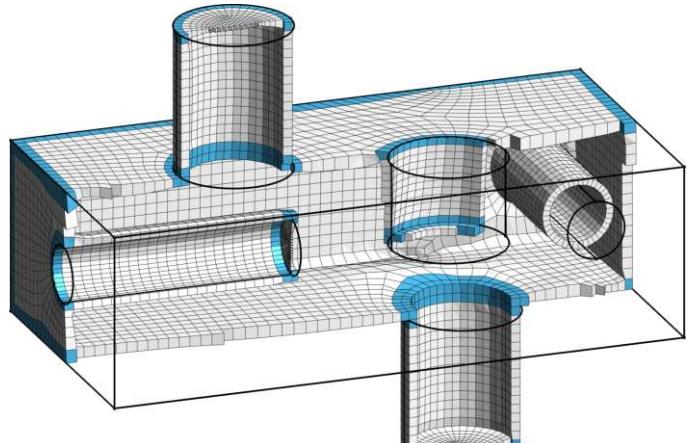
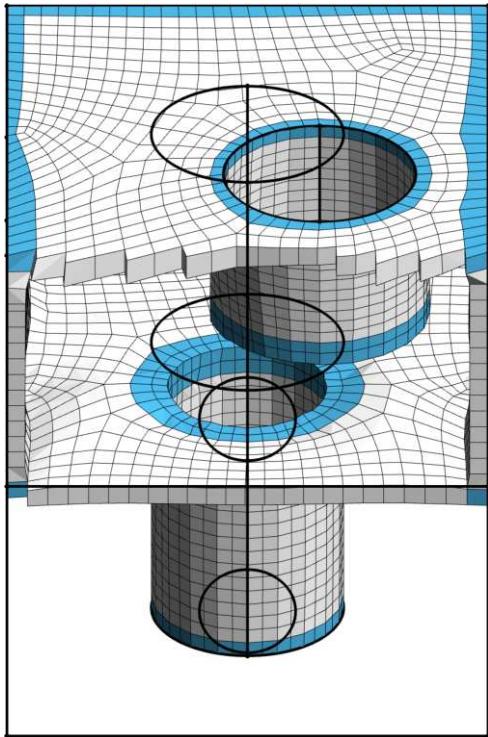
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
3009	2513	0.480	0.92	0.97	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 3.20927s	20108	10052	391.942	-	-	0.505	0.88	0.95
Ours	0.002693s / 0.723351s	19364	9676	0	0	0	0.559	0.93	0.97

Figures:



Model: B58

CAD: 26 corners, 44 curves, 18 surfaces, 1 volume

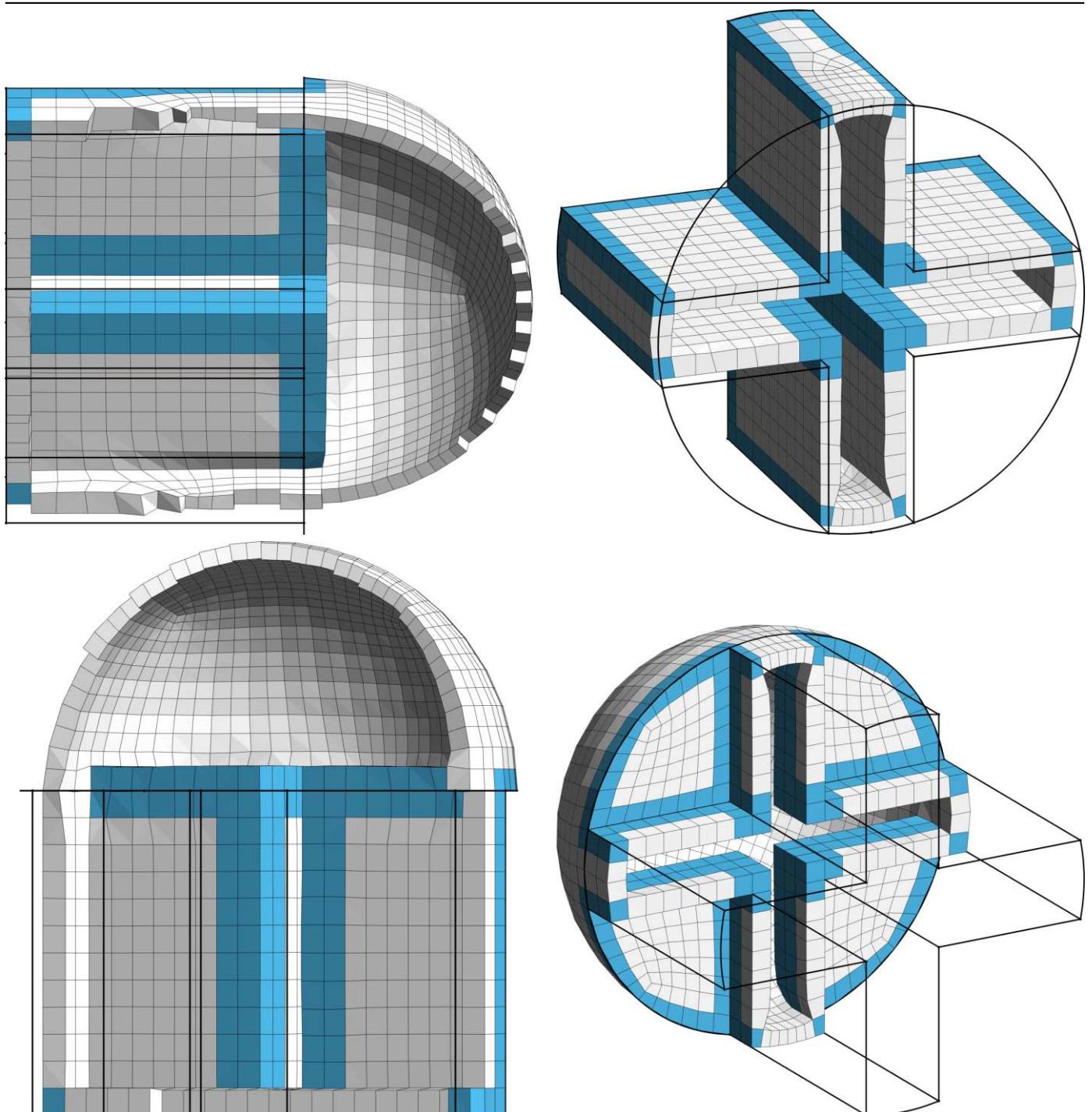
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
845	647	0.684	0.96	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.790628s	5180	2588	164.233	-	-	0.326	0.86	0.96
Ours	0.001425s / 0.240654s	4962	2478	0	0	0	0.702	0.96	0.99

Figures:



Model: B59

CAD: 24 corners, 40 curves, 18 surfaces, 1 volume

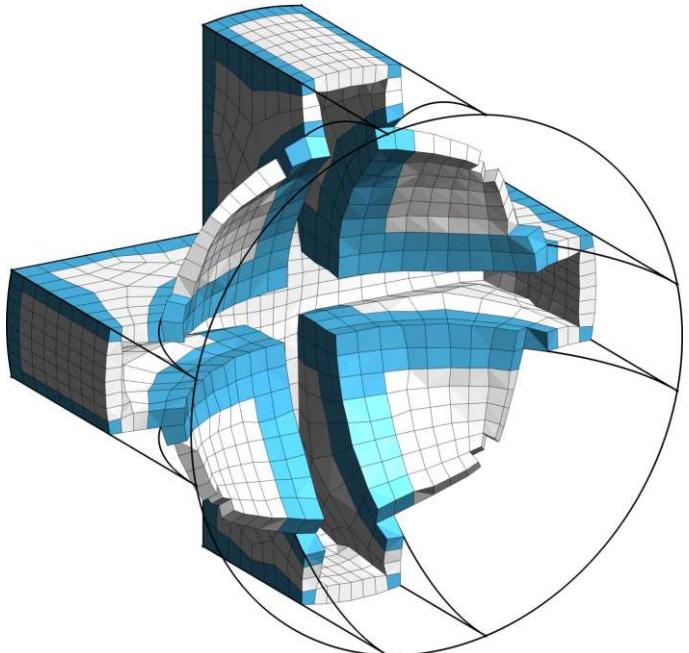
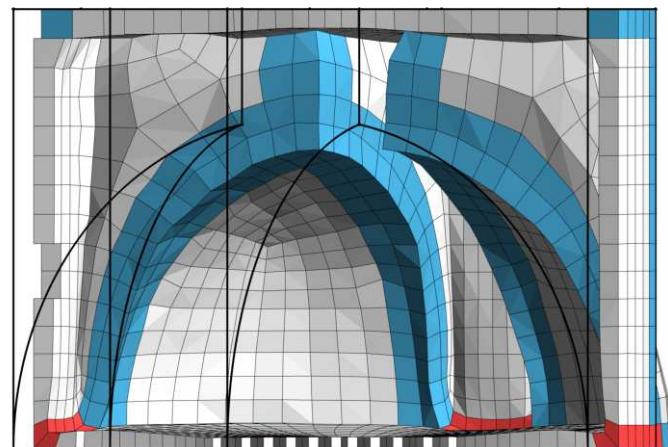
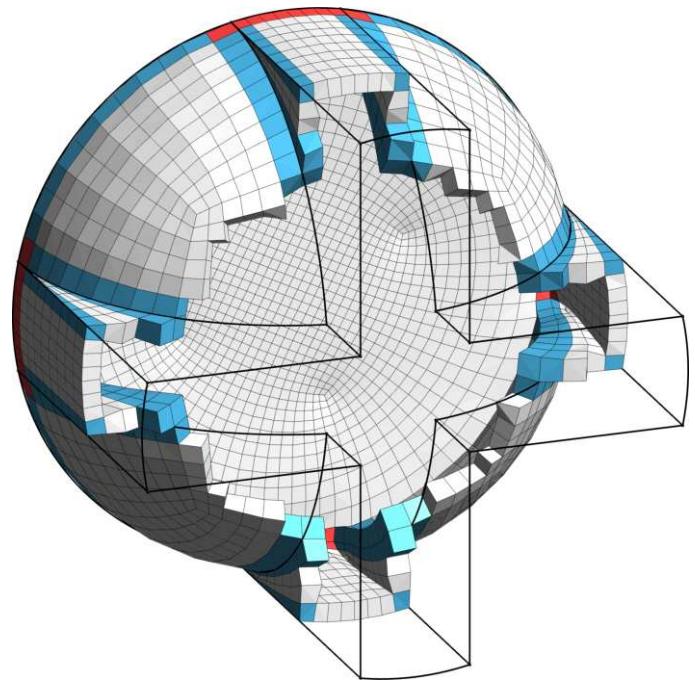
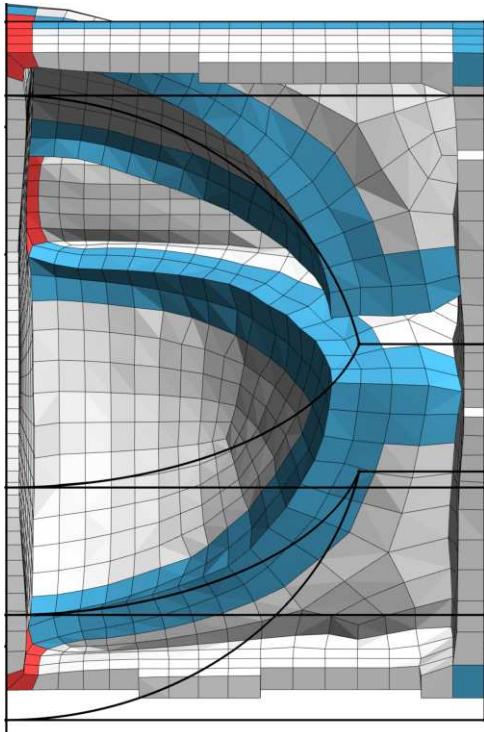
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1098	856	0.069	0.88	0.96	8

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 2.05432s	6852	3424	193.623	-	-	0.041	0.81	0.89
Ours	2.97436s / 0.862795s	6596	3296	15.9971	1	20	0.055	0.88	0.96

Figures:



Model: B5

CAD: 2 corners, 3 curves, 3 surfaces, 1 volume

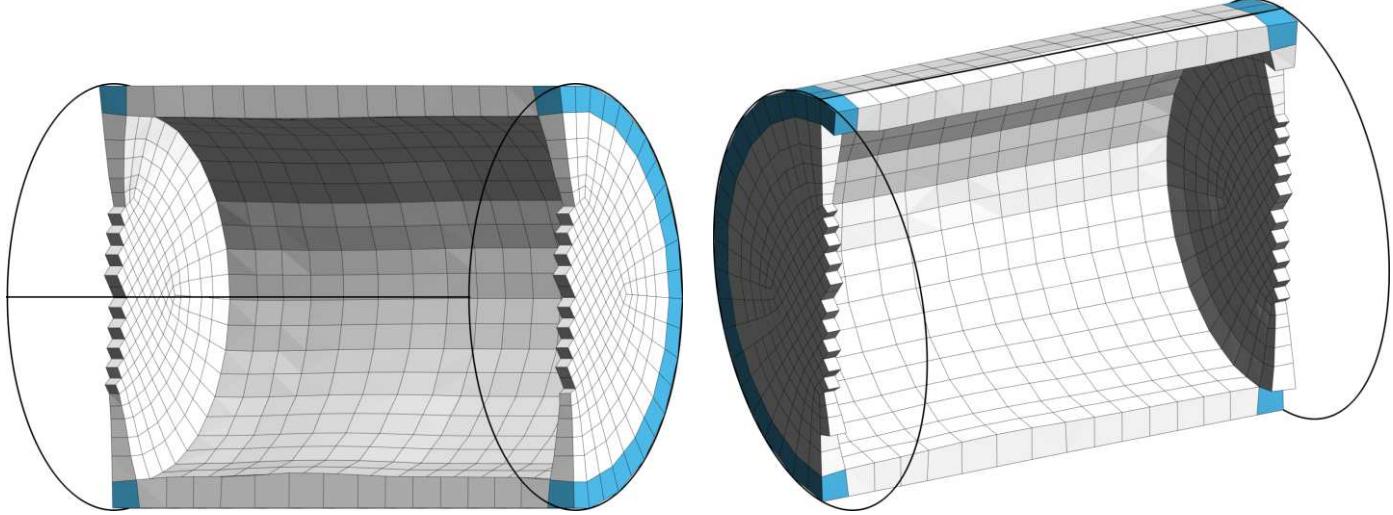
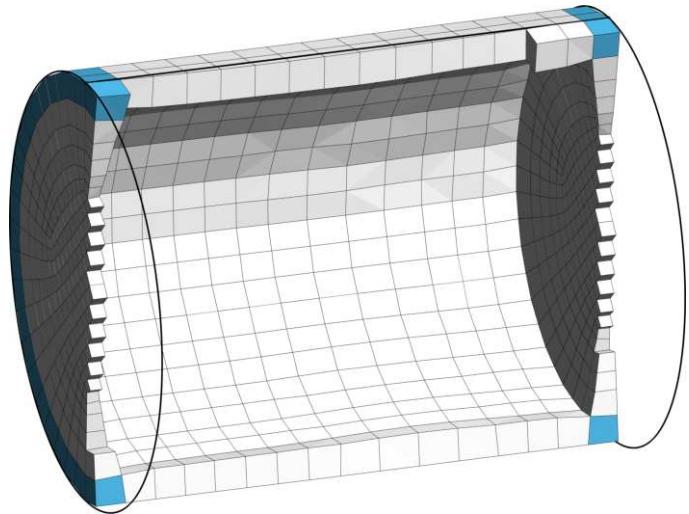
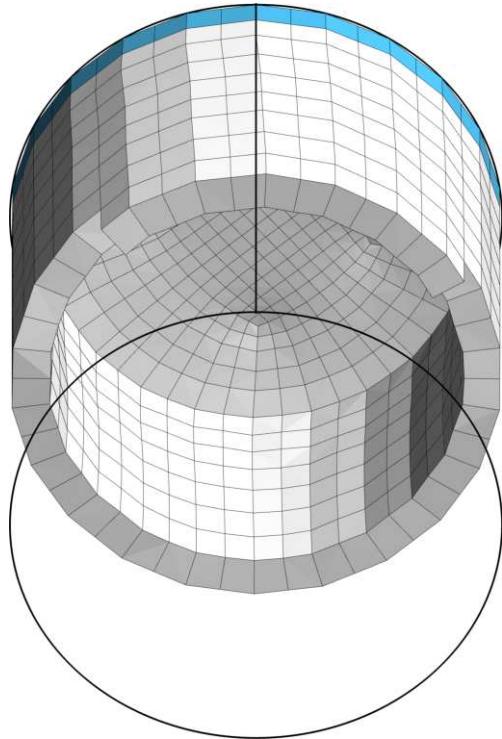
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
414	368	0.847	0.97	0.98	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.435509s	2948	1472	44.1489	-	-	0.632	0.92	0.96
Ours	0.000479s / 0.096875s	2772	1384	0	0	0	0.871	0.97	0.97

Figures:



Model: B60

CAD: 6 corners, 11 curves, 5 surfaces, 1 volume

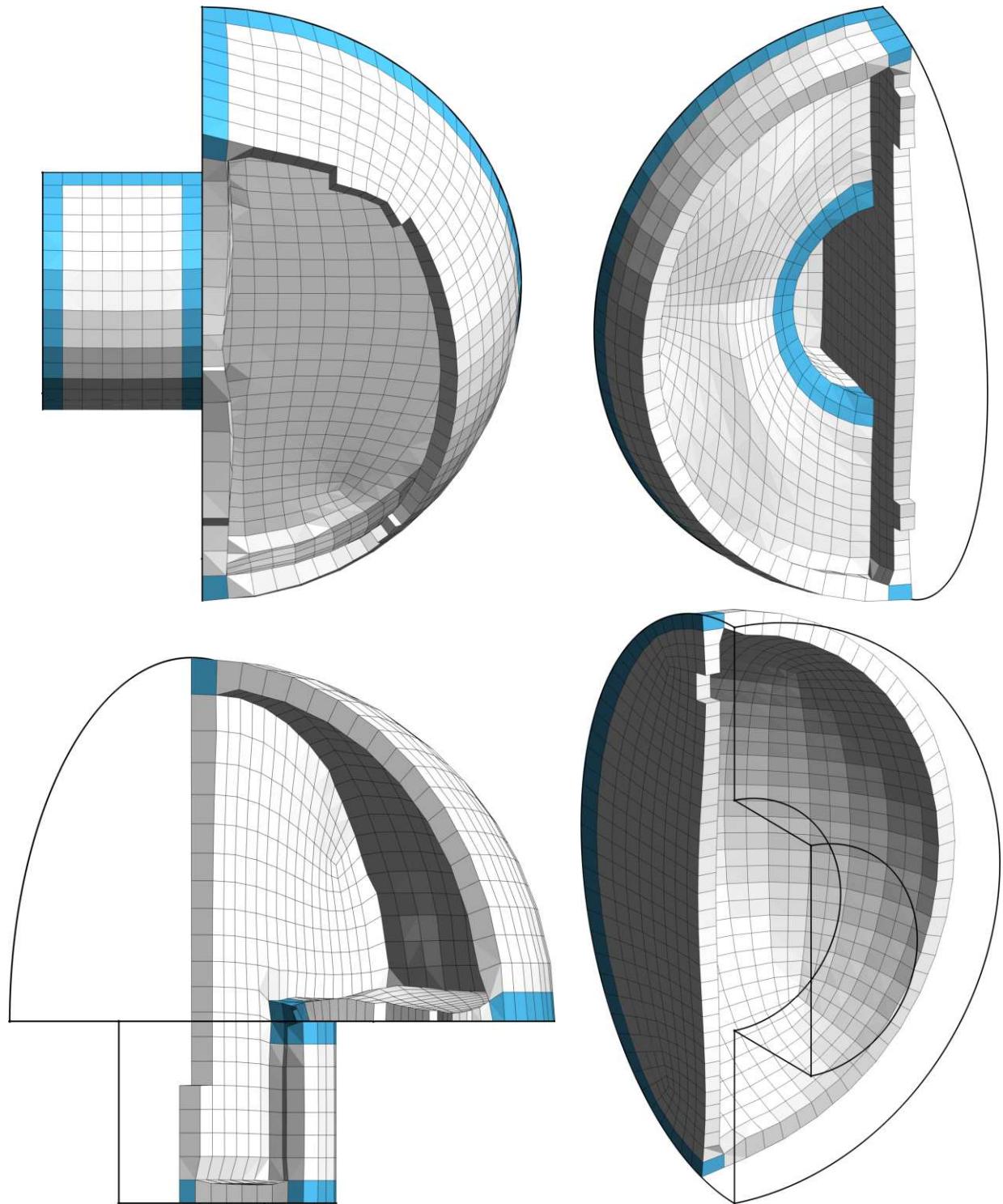
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
565	470	0.322	0.90	0.95	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.655819s	3764	1880	97.2366	-	-	0.359	0.84	0.91
Ours	0.001098s / 0.162512s	3490	1742	0	0	0	0.384	0.91	0.96

Figures:



Model: B61

CAD: 6 corners, 11 curves, 5 surfaces, 1 volume

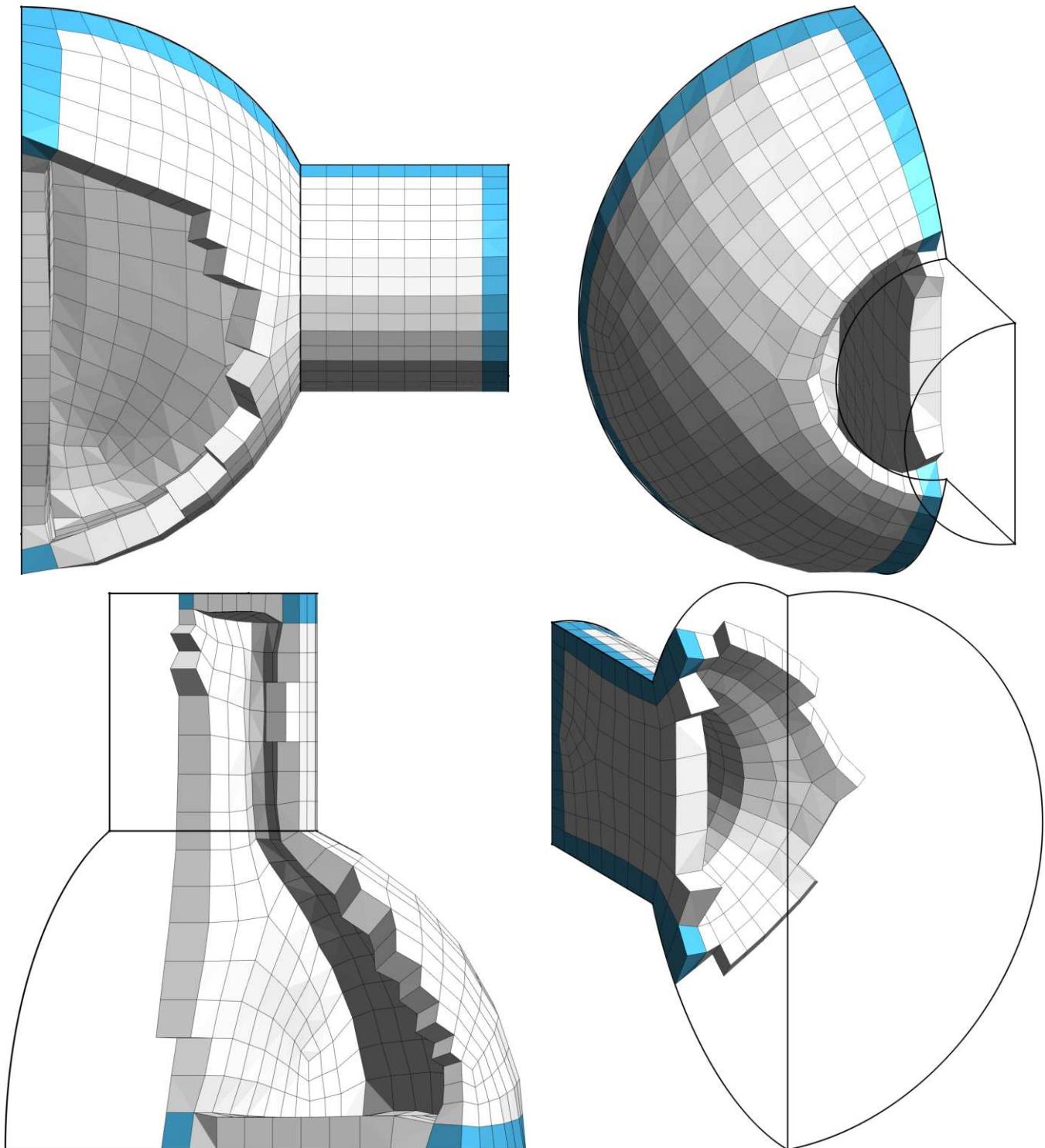
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
324	247	0.715	0.94	0.95	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.456109s	1980	988	67.3773	-	-	0.420	0.82	0.87
Ours	0.000398s / 0.07672s	1744	868	0	0	0	0.724	0.92	0.93

Figures:



Model: B62

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

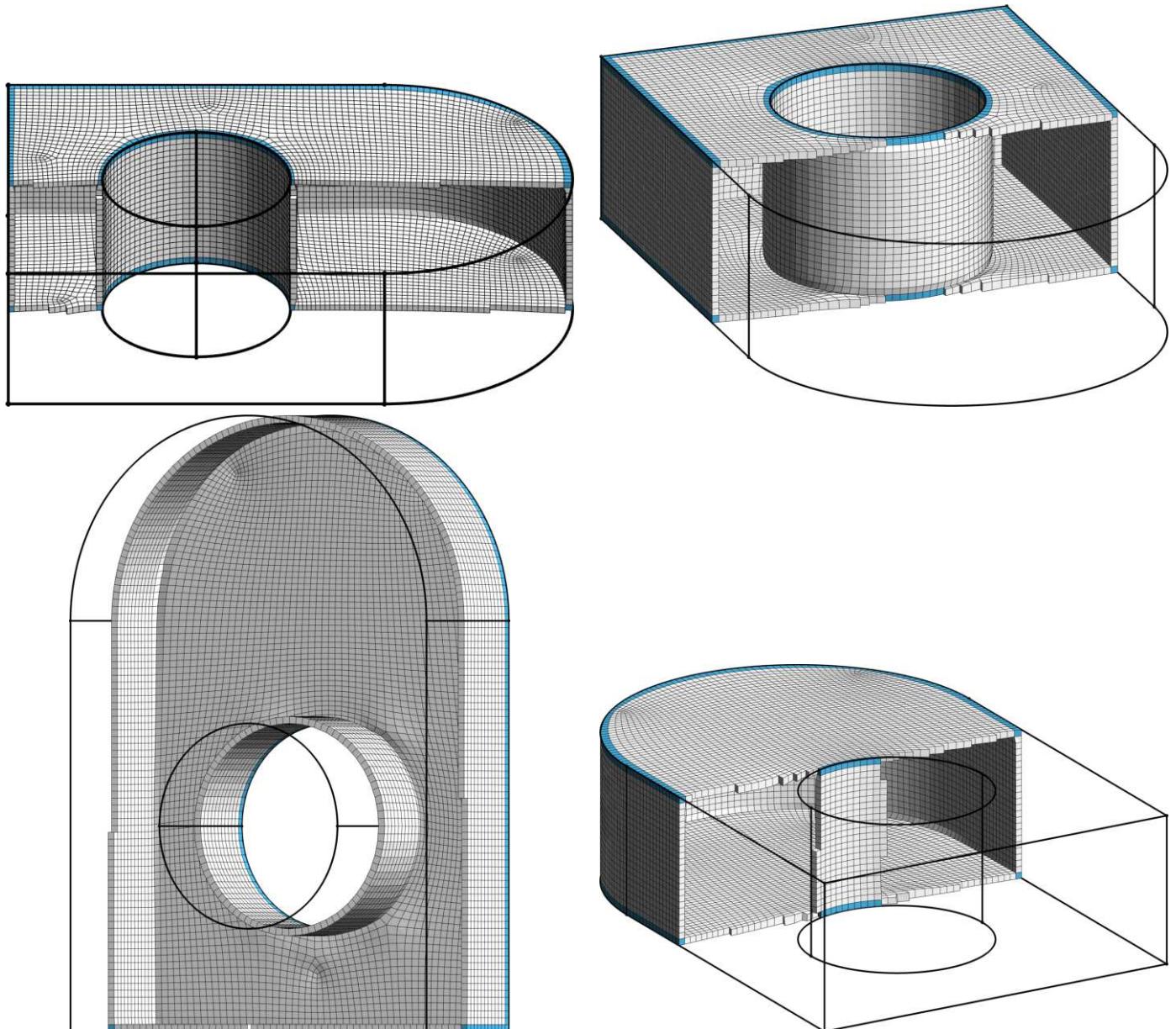
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
4682	4252	0.643	0.97	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 11.2125s	34016	17008	375.919	-	-	0.487	0.93	0.98
Ours	0.004473s / 0.840559s	32524	16260	0	0	0	0.723	0.98	0.99

Figures:



Model: B63

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

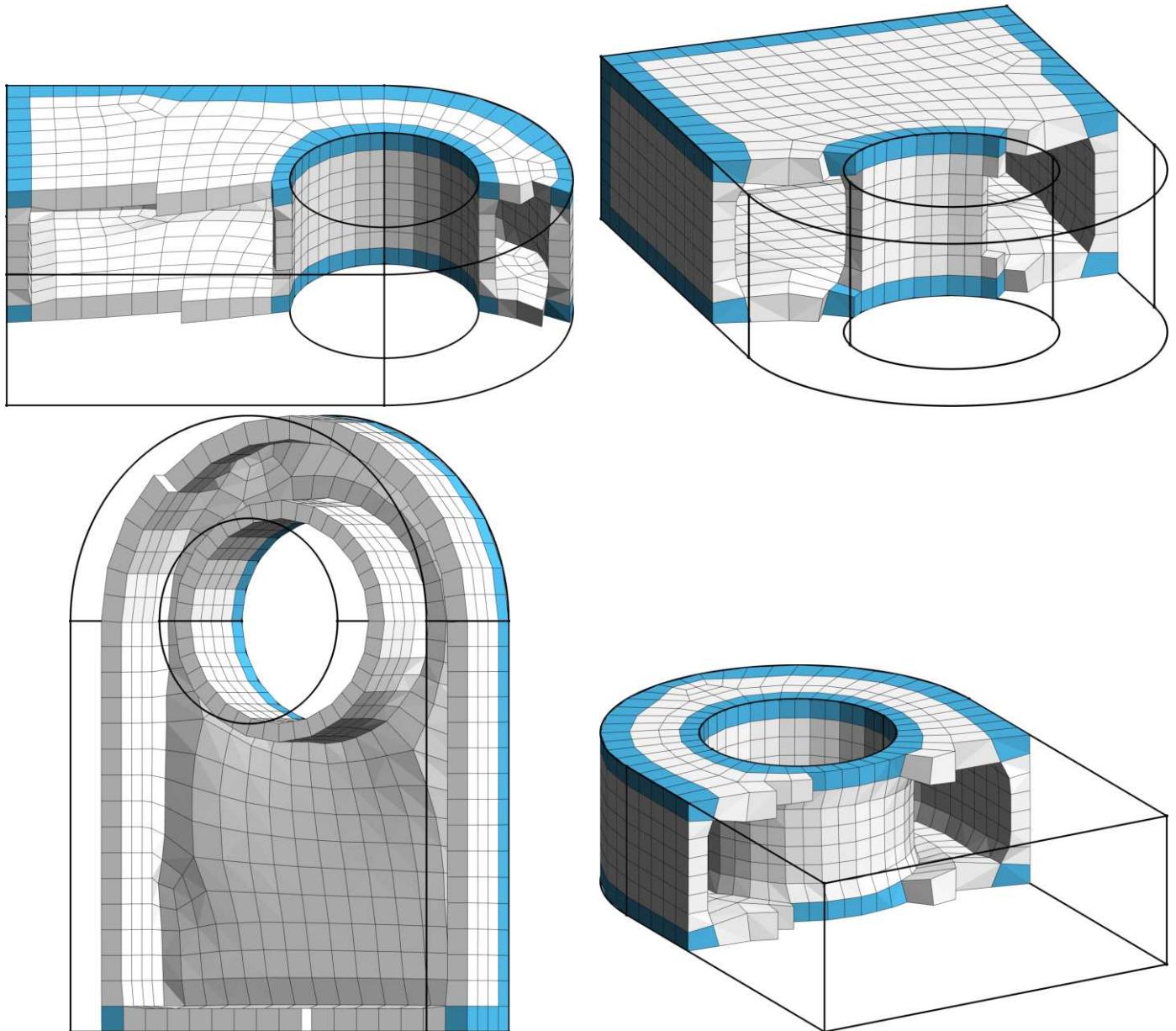
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
520	378	0.693	0.94	0.96	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.692804s	3024	1512	120.137	-	-	0.544	0.82	0.84
Ours	0.000528s / 0.090864s	2556	1276	0	0	0	0.731	0.94	0.96

Figures:



Model: B64

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

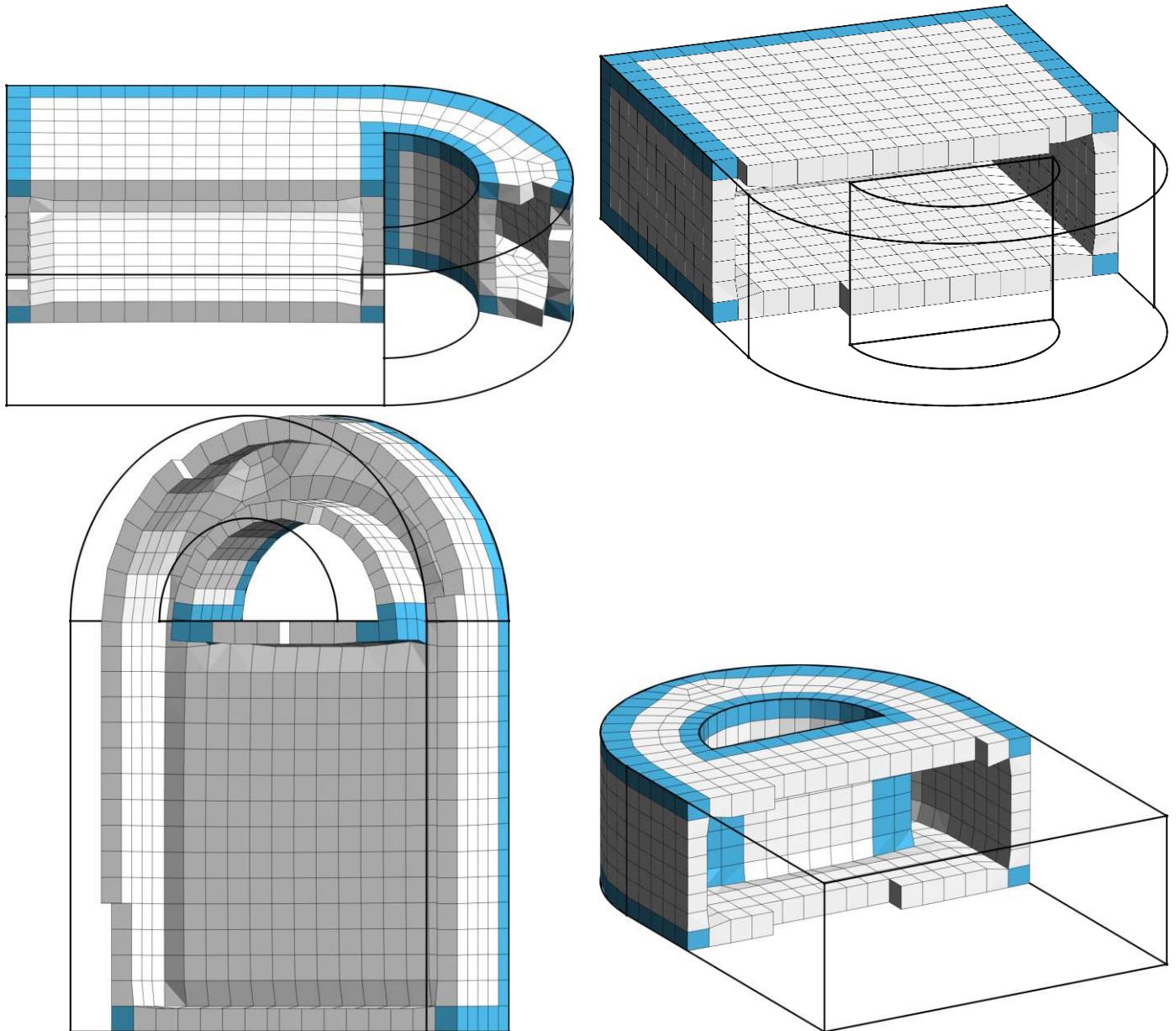
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
504	374	0.727	0.96	0.97	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.633221s	2992	1496	117.797	-	-	0.440	0.83	0.85
Ours	0.00052s / 0.07746s	2592	1296	0	0	0	0.774	0.96	0.97

Figures:



Model: B65

CAD: 12 corners, 18 curves, 8 surfaces, 1 volume

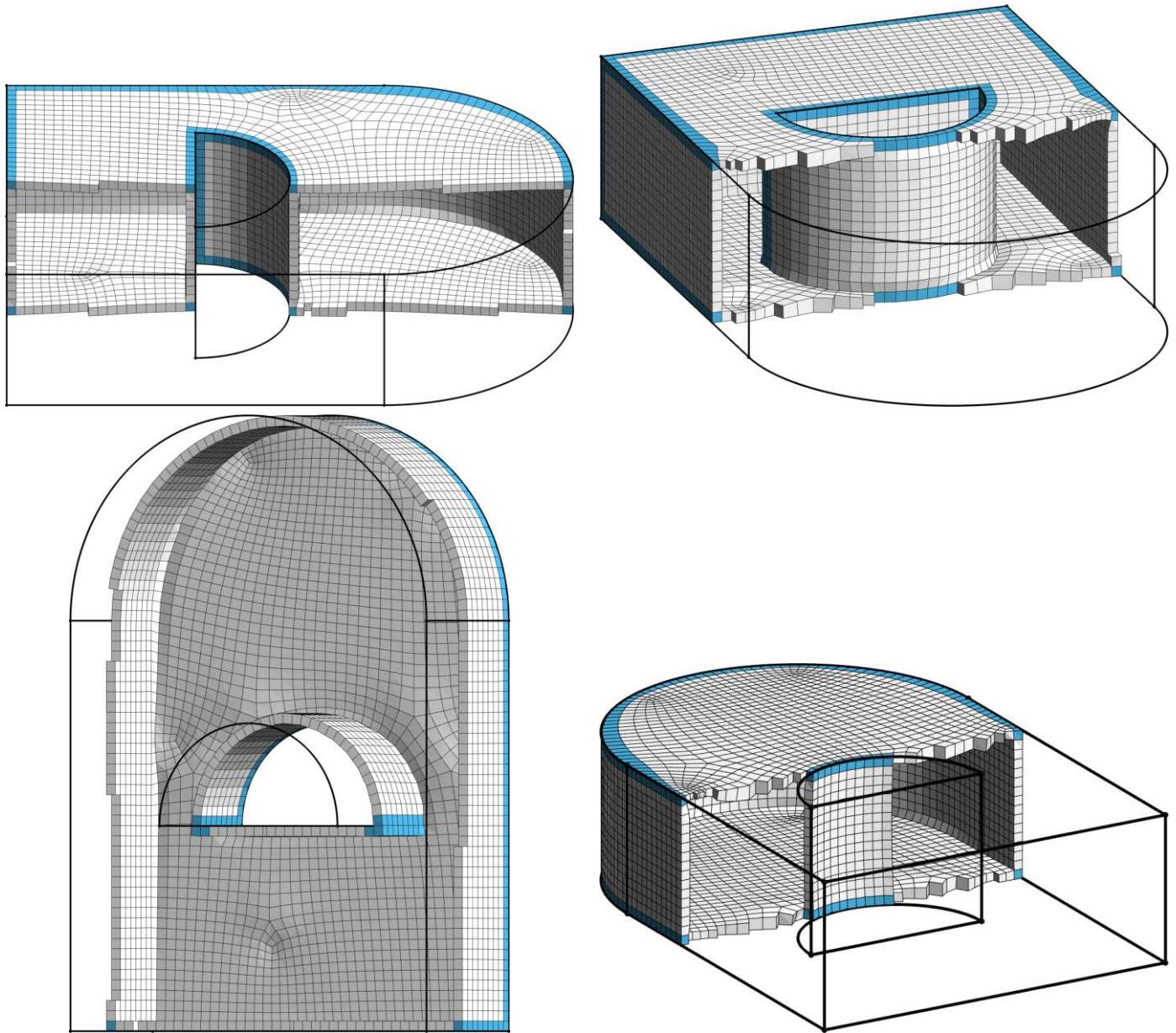
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2147	1861	0.747	0.98	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 3.33032s	14888	7444	266.102	-	-	0.447	0.92	0.98
Ours	0.002151s / 0.402358s	13960	6980	0	0	0	0.729	0.98	0.99

Figures:



Model: B66

CAD: 16 corners, 24 curves, 10 surfaces, 1 volume

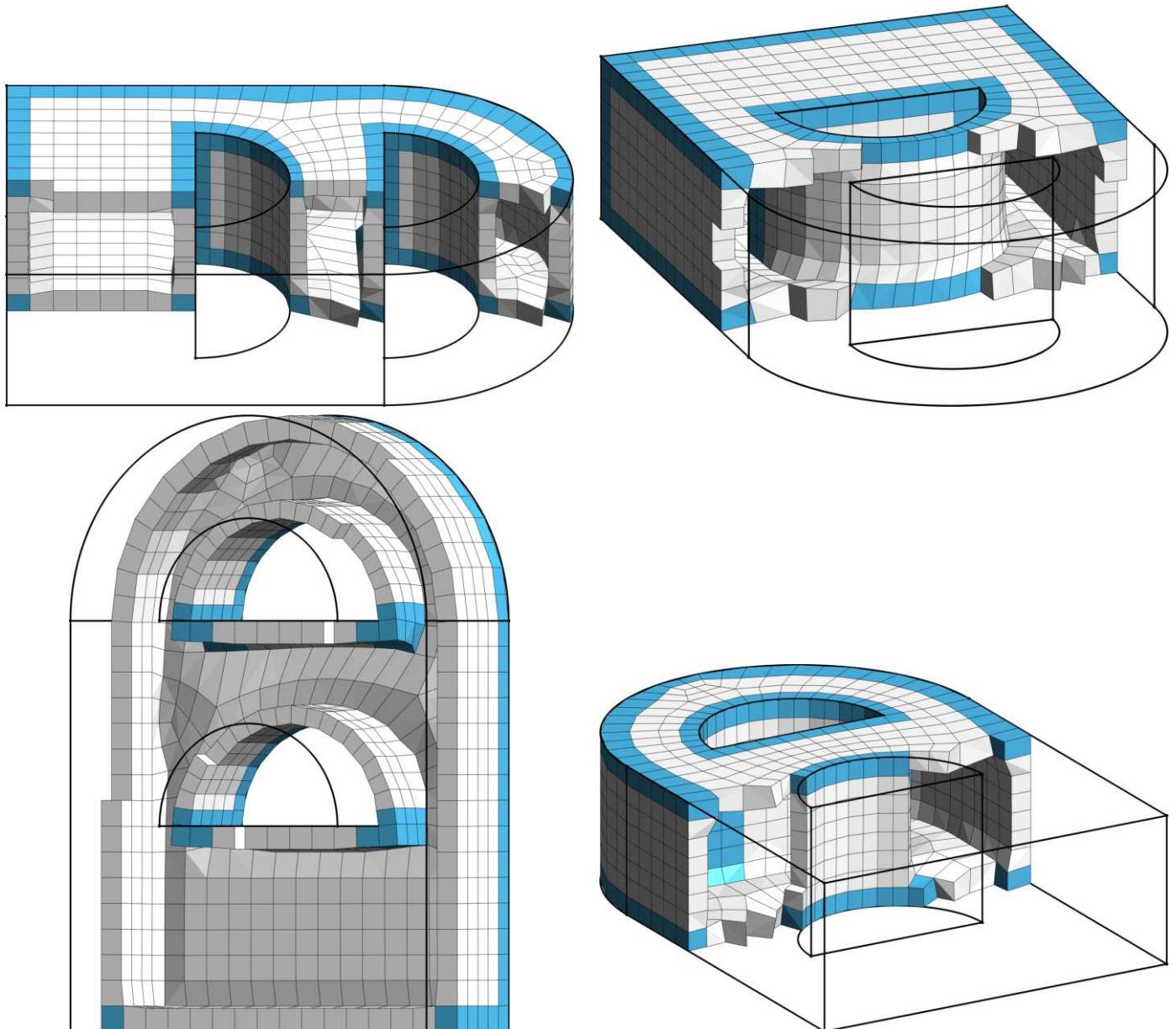
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
587	421	0.624	0.95	0.97	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.828236s	3364	1684	155.363	-	-	0.336	0.80	0.83
Ours	0.000669s / 0.101211s	2872	1440	0	0	0	0.696	0.95	0.96

Figures:



Model: B67

CAD: 8 corners, 14 curves, 8 surfaces, 1 volume

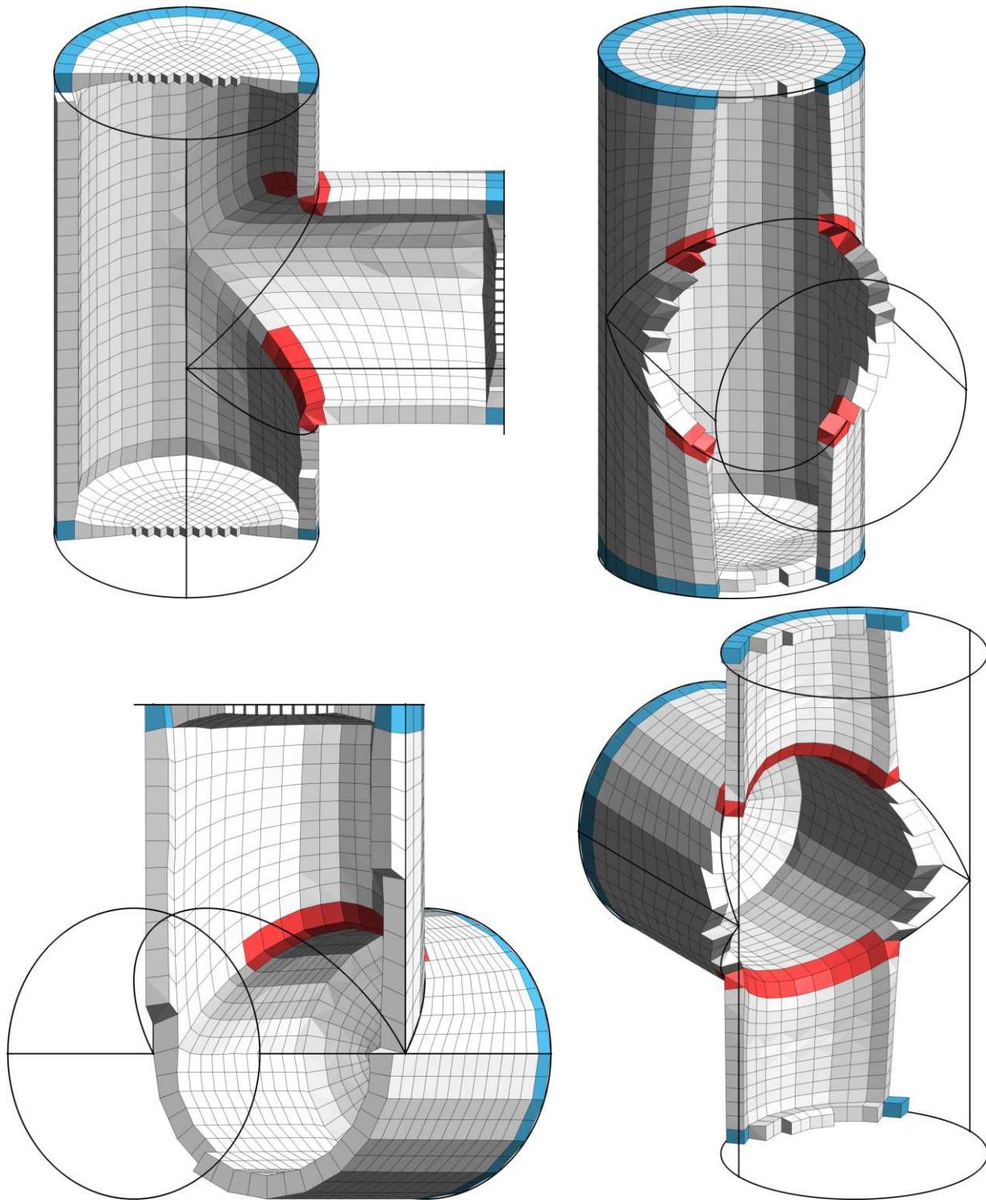
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
739	615	0.552	0.91	0.96	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.537801s	4924	2460	66.3546	-	-	0.498	0.88	0.94
Ours	2.98979s / 0.16509s	4684	2340	6.50458	1	10	0.487	0.92	0.96

Figures:



Model: B68

CAD: 10 corners, 20 curves, 12 surfaces, 1 volume

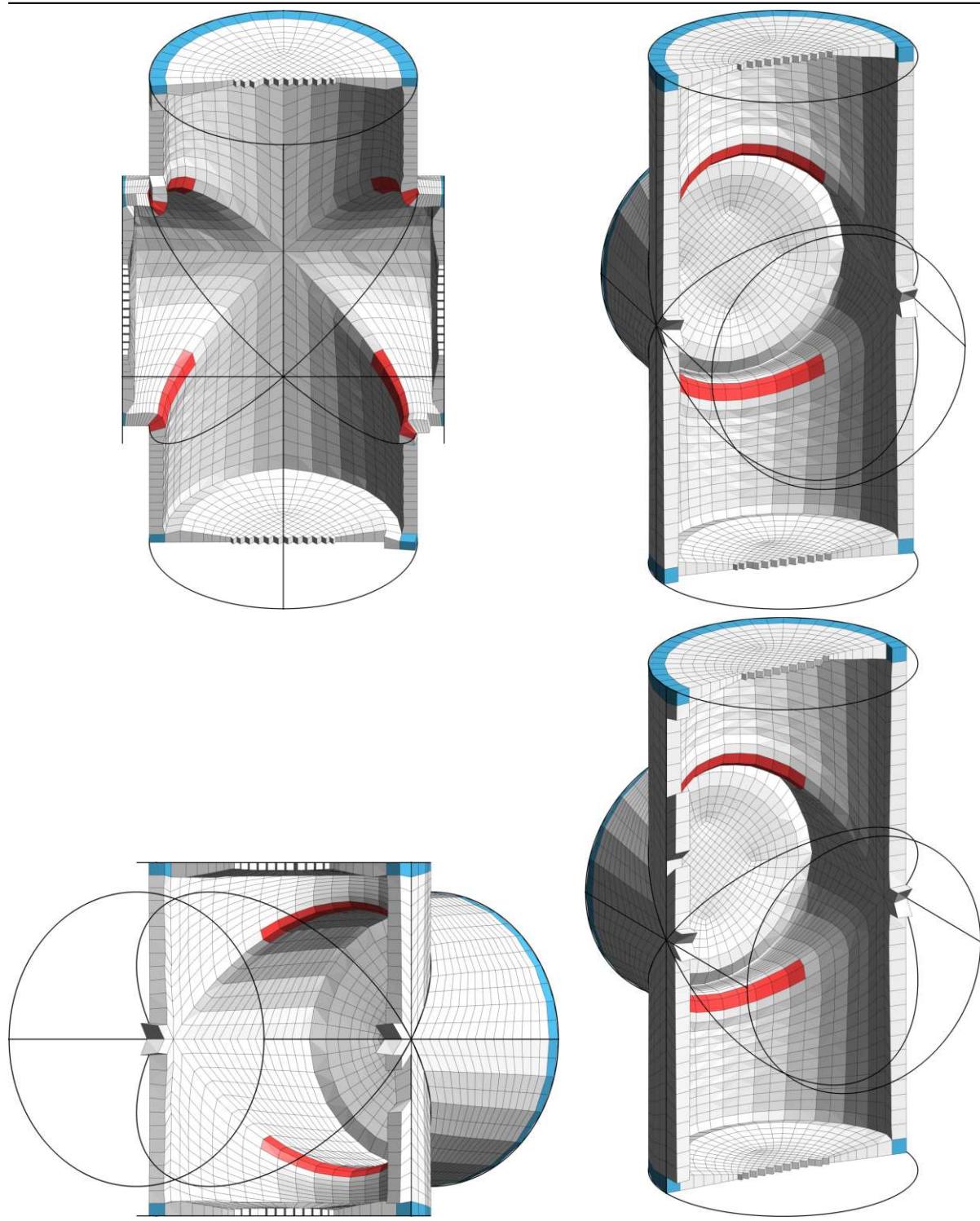
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1412	1200	0.190	0.77	0.85	8

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 2.60175s	9604	4800	110.112	-	-	0.130	0.77	0.83
Ours	0.888676s / 0.714729s	9220	4608	14.113	4	20	0.135	0.80	0.88

Figures:



Model: B69

CAD: 8 corners, 12 curves, 7 surfaces, 1 volume

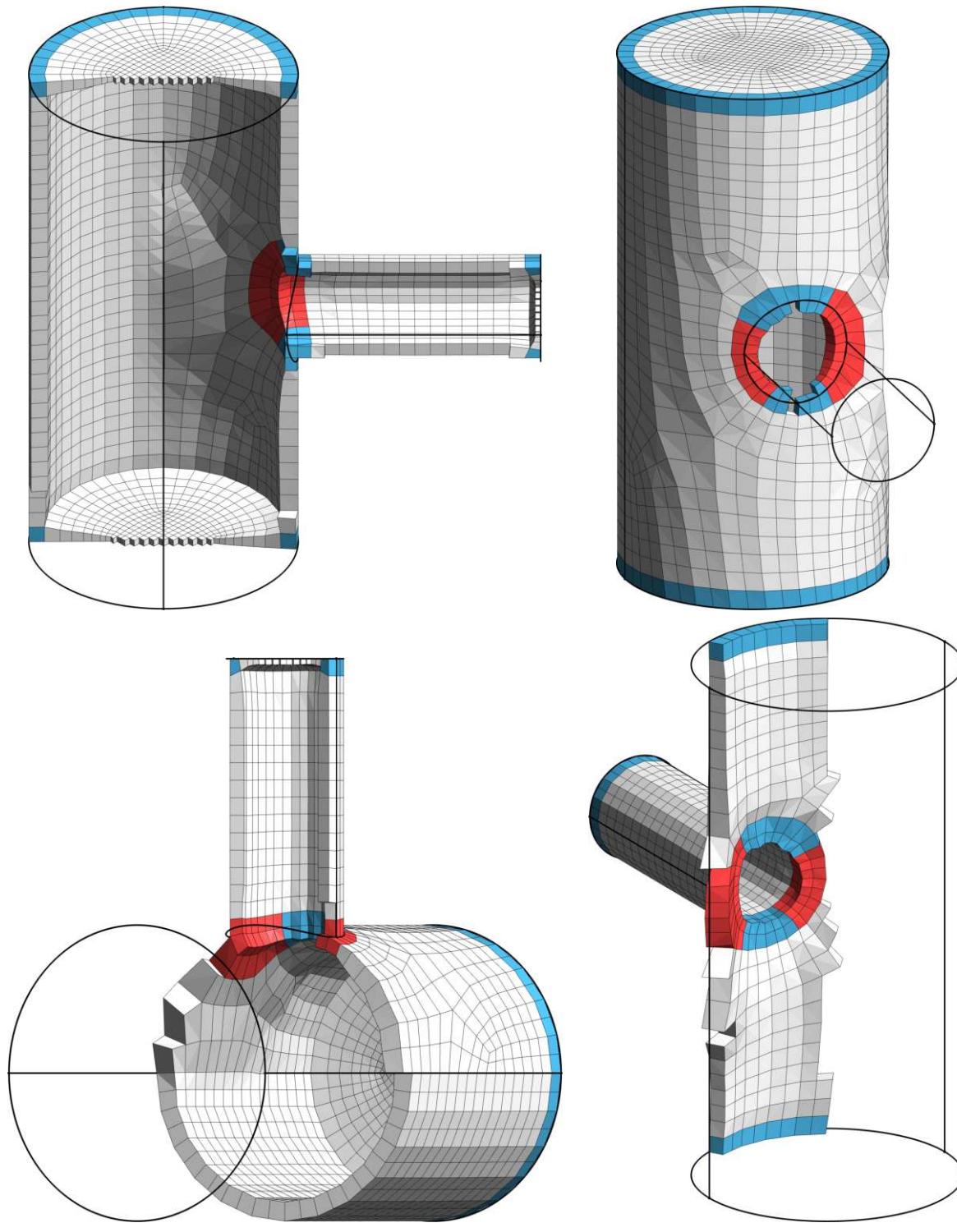
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
922	788	0.393	0.95	0.98	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.12162s	6308	3152	71.4909	-	-	0.471	0.91	0.97
Ours	2.99158s / 0.182564s	6116	3056	0.906799	1	9	0.494	0.94	0.98

Figures:



Model: B6

CAD: 7 corners, 11 curves, 6 surfaces, 1 volume

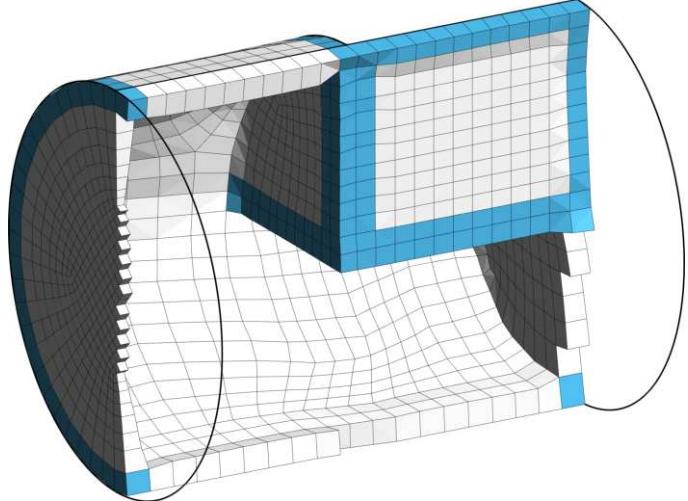
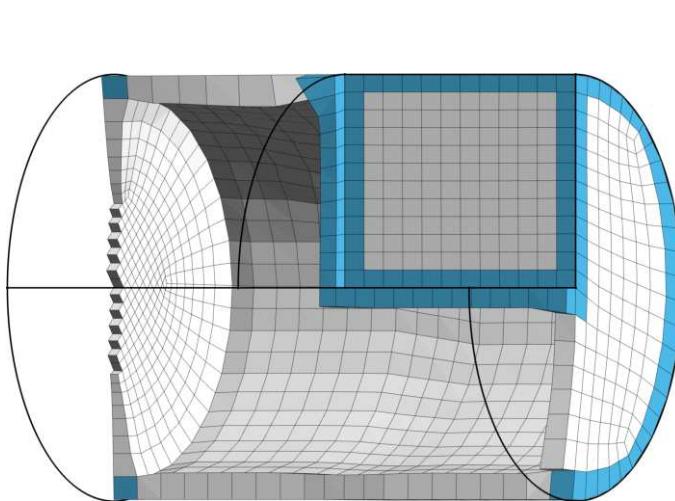
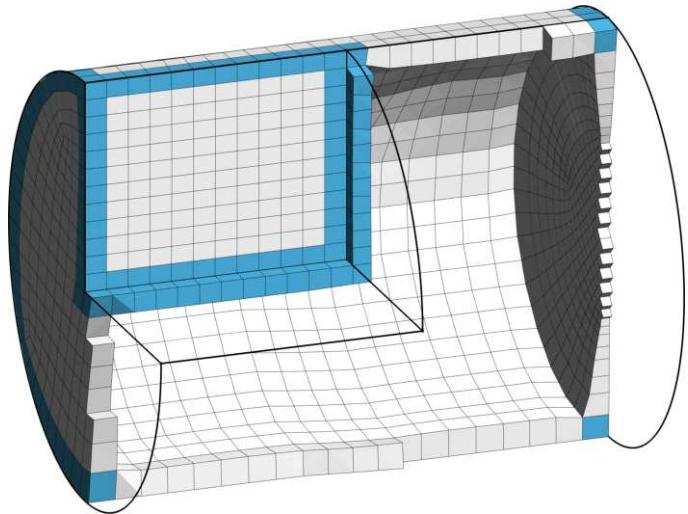
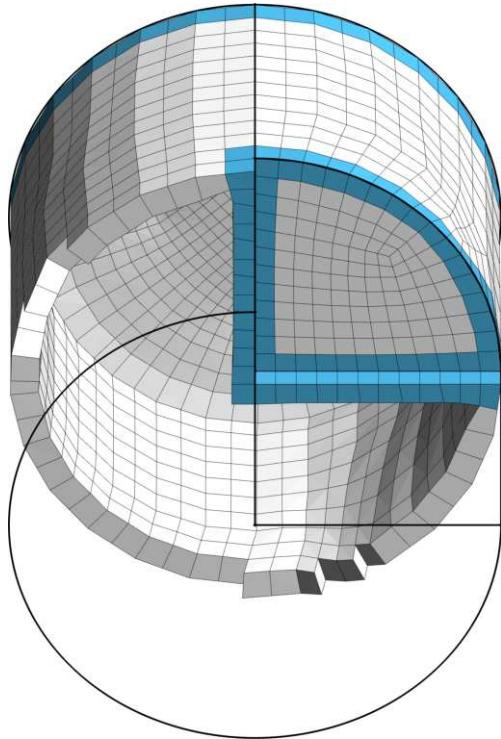
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
656	555	0.682	0.96	0.97	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.588406s	4444	2220	97.8243	-	-	0.322	0.89	0.97
Ours	0.000763s / 0.118673s	4204	2100	0	0	0	0.693	0.96	0.97

Figures:



Model: B70

CAD: 12 corners, 18 curves, 10 surfaces, 1 volume

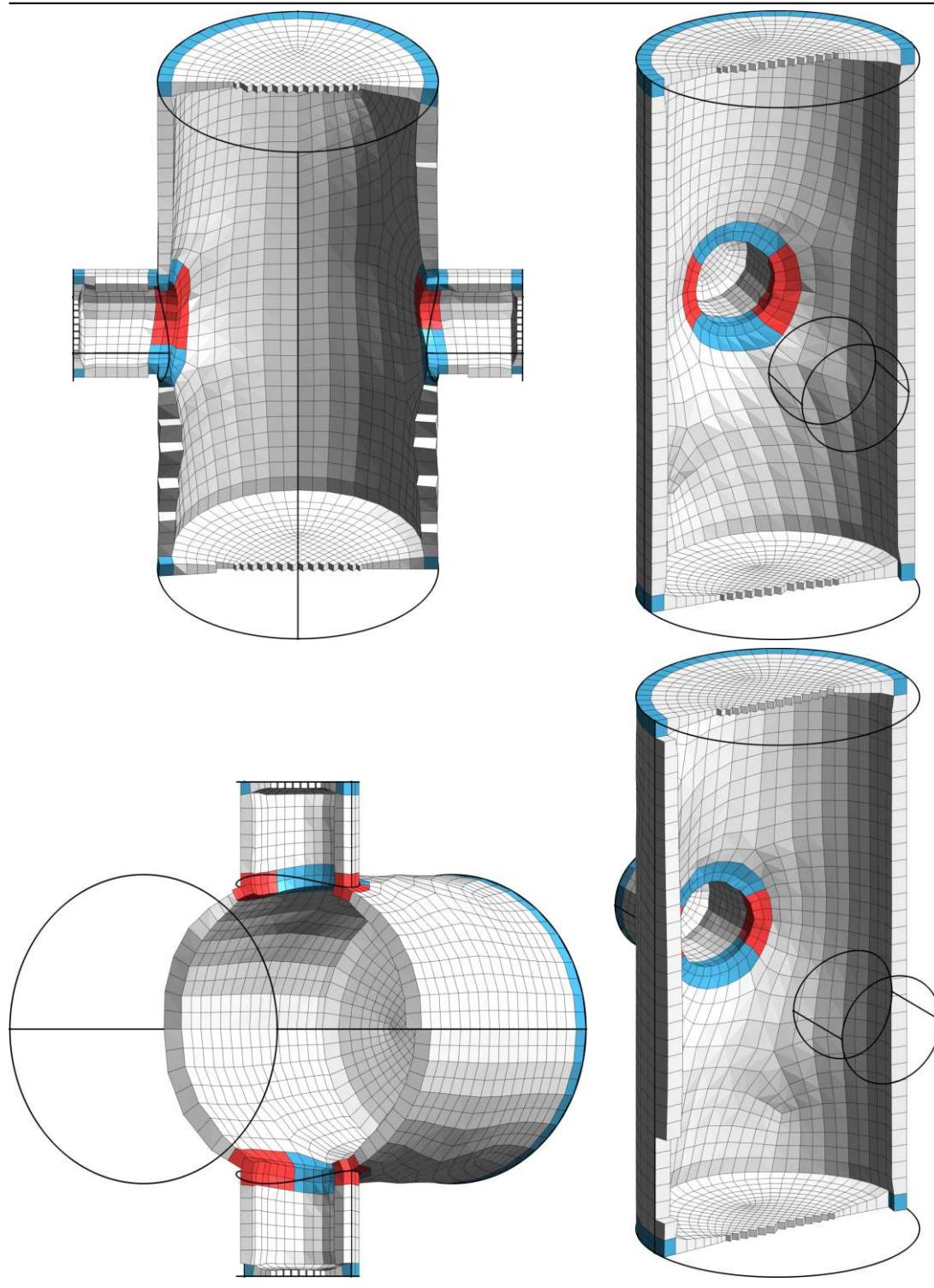
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1138	962	0.526	0.95	0.98	8

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.914169s	7700	3848	105.863	-	-	0.537	0.92	0.96
Ours	5.98927s / 0.280329s	7476	3736	0.788116	2	13	0.570	0.95	0.96

Figures:



Model: B71

CAD: 8 corners, 12 curves, 7 surfaces, 1 volume

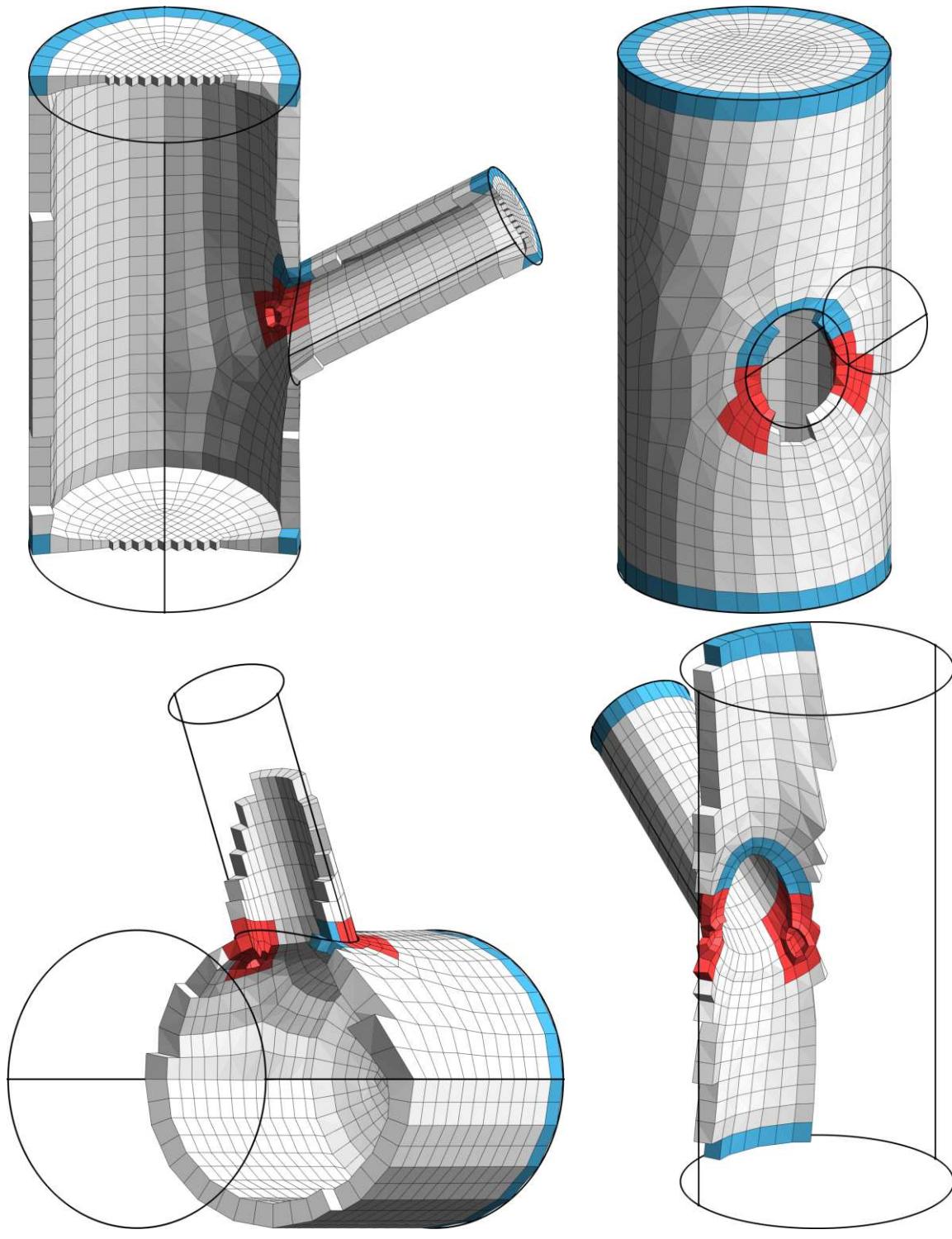
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
676	562	0.571	0.92	0.97	2

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.457624s	4500	2248	63.9387	-	-	0.500	0.87	0.95
Ours	0.011678s / 0.26706s	4350	2172	6.86955	2	10	0.478	0.90	0.96

Figures:



Model: B72

CAD: 8 corners, 12 curves, 7 surfaces, 1 volume

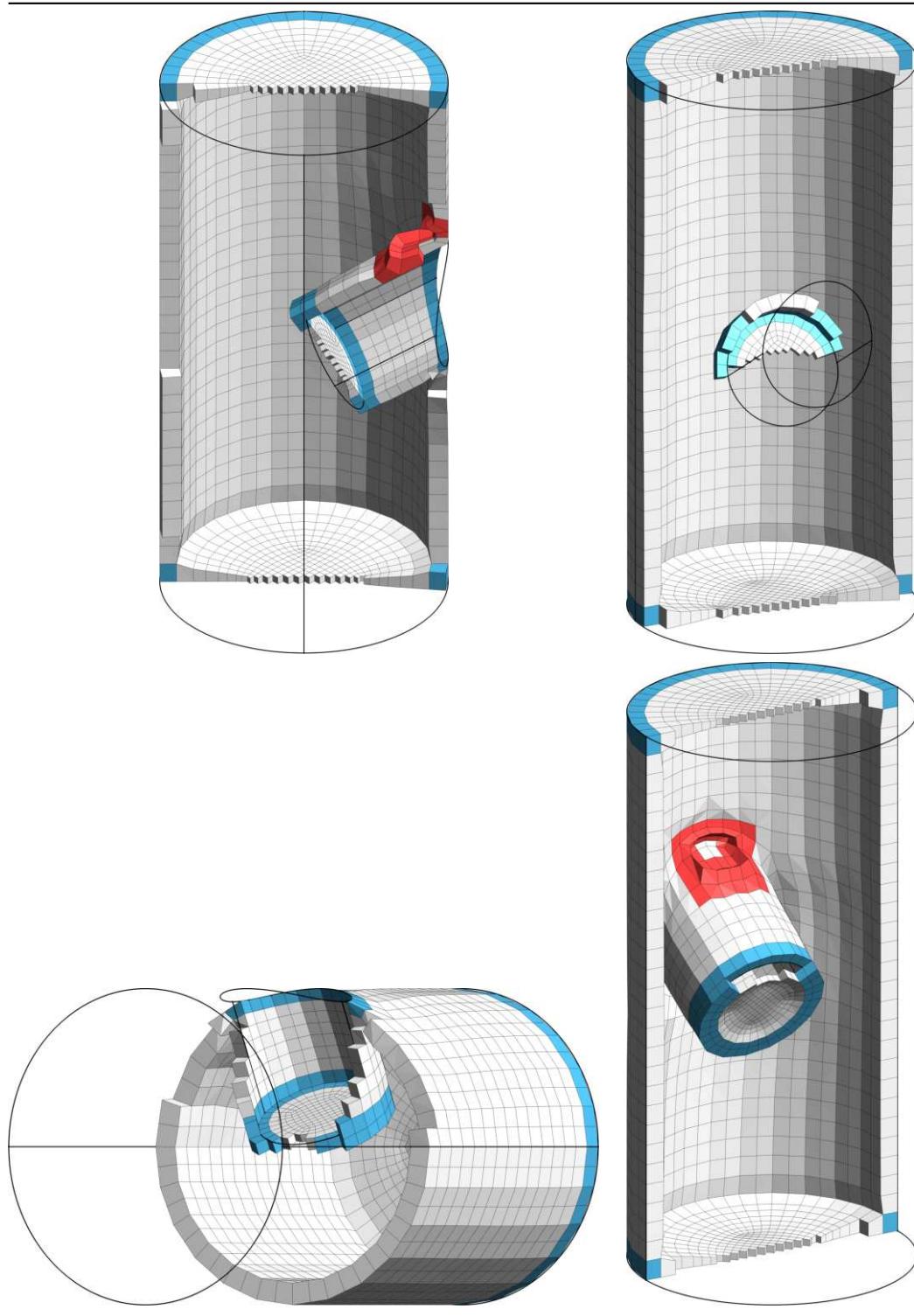
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
835	713	0.632	0.96	0.99	2

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.515023s	5708	2852	86.523	-	-	0.258	0.91	0.97
Ours	0.037781s / 0.170617s	5550	2774	7.6274	1	8	0.370	0.95	0.97

Figures:



Model: B73

CAD: 8 corners, 12 curves, 6 surfaces, 1 volume

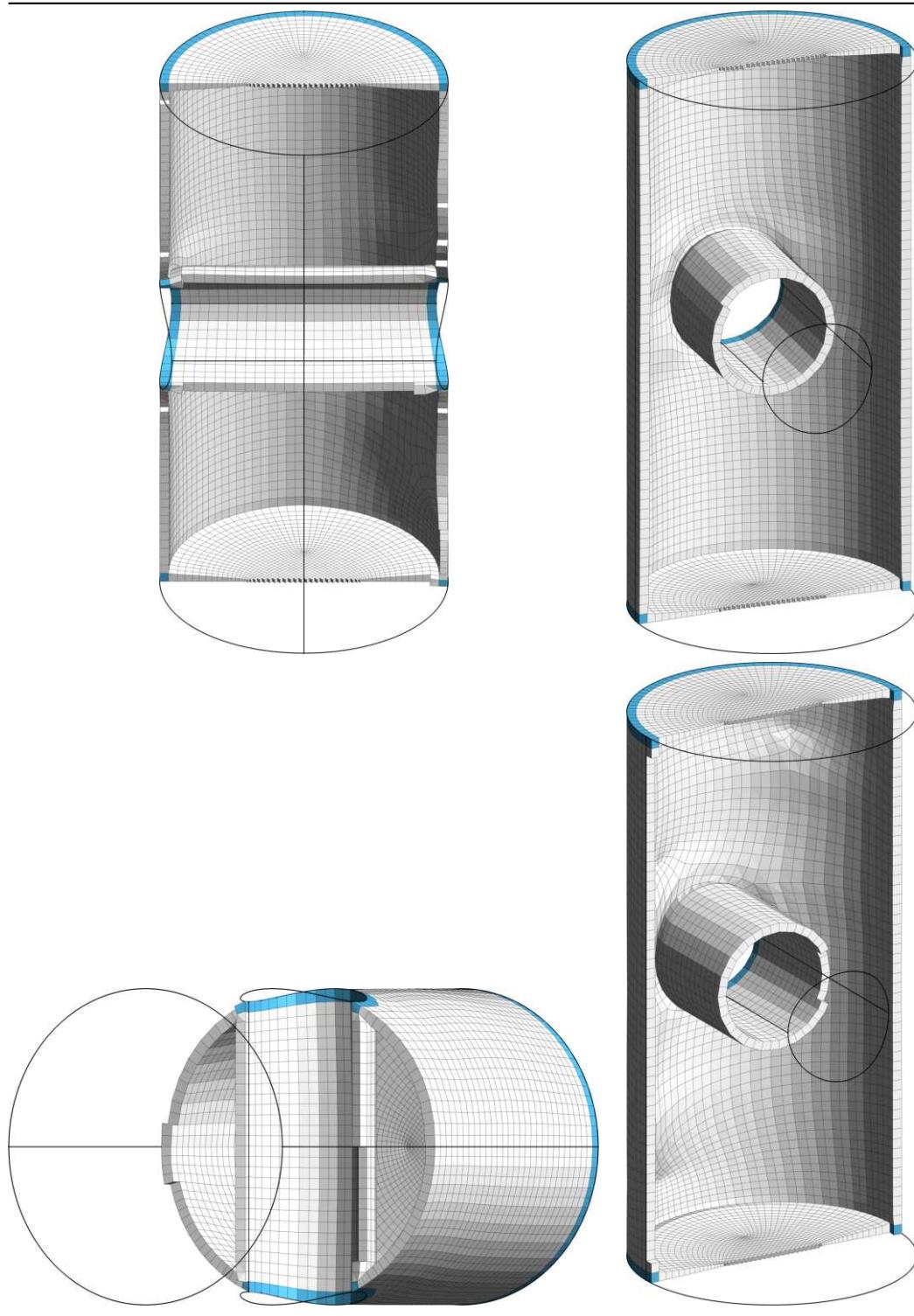
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2860	2636	0.504	0.97	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.97795s	21088	10544	149.463	-	-	0.338	0.95	0.99
Ours	0.002796s / 0.527321s	20544	10272	0	0	0	0.535	0.97	0.99

Figures:



Model: B74

CAD: 8 corners, 12 curves, 7 surfaces, 1 volume

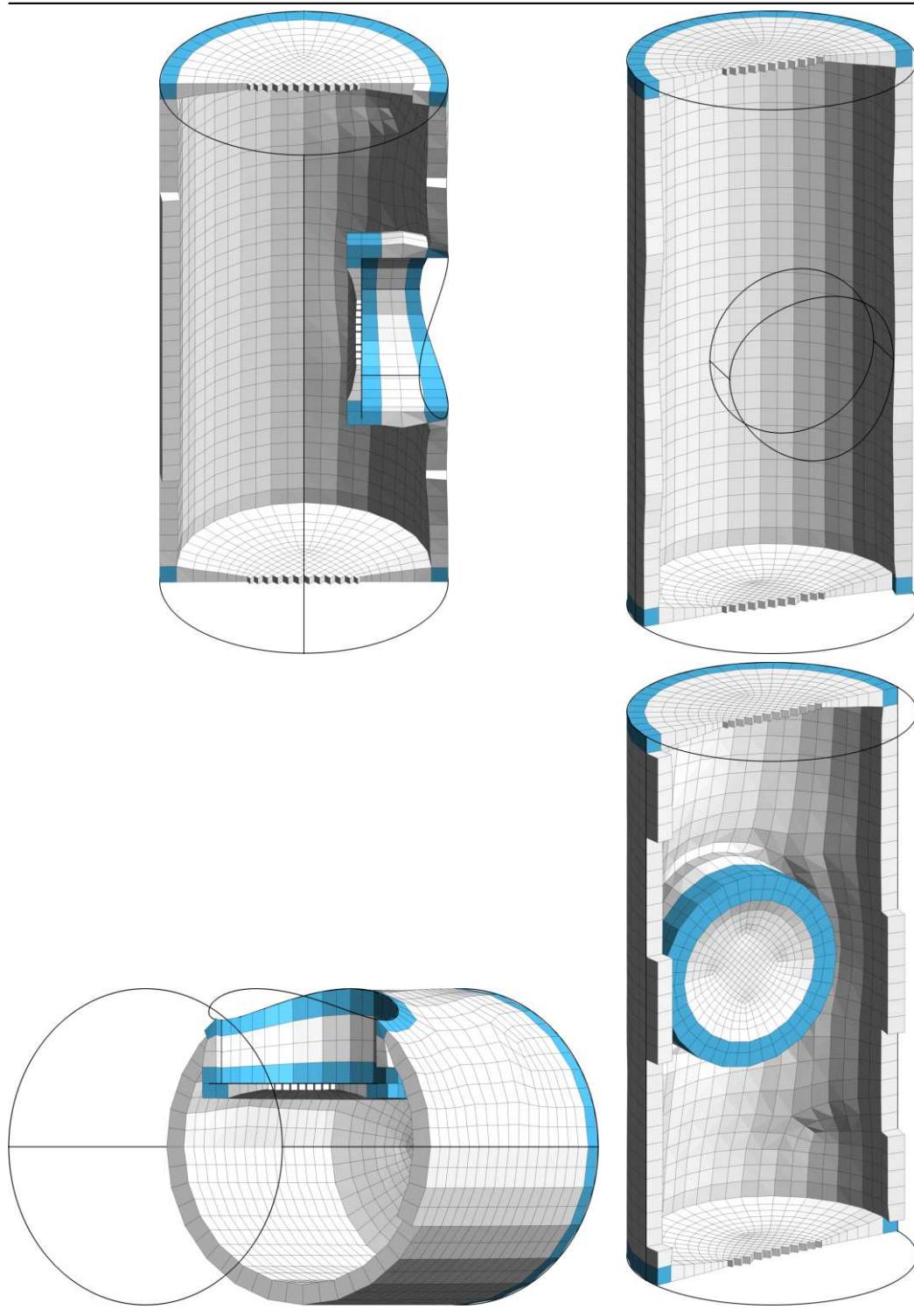
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
883	753	0.658	0.97	0.98	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.733518s	6028	3012	100.078	-	-	0.285	0.91	0.98
Ours	0.000857s / 0.142409s	5836	2916	0	0	0	0.686	0.97	0.98

Figures:



Model: B75

CAD: 12 corners, 18 curves, 10 surfaces, 1 volume

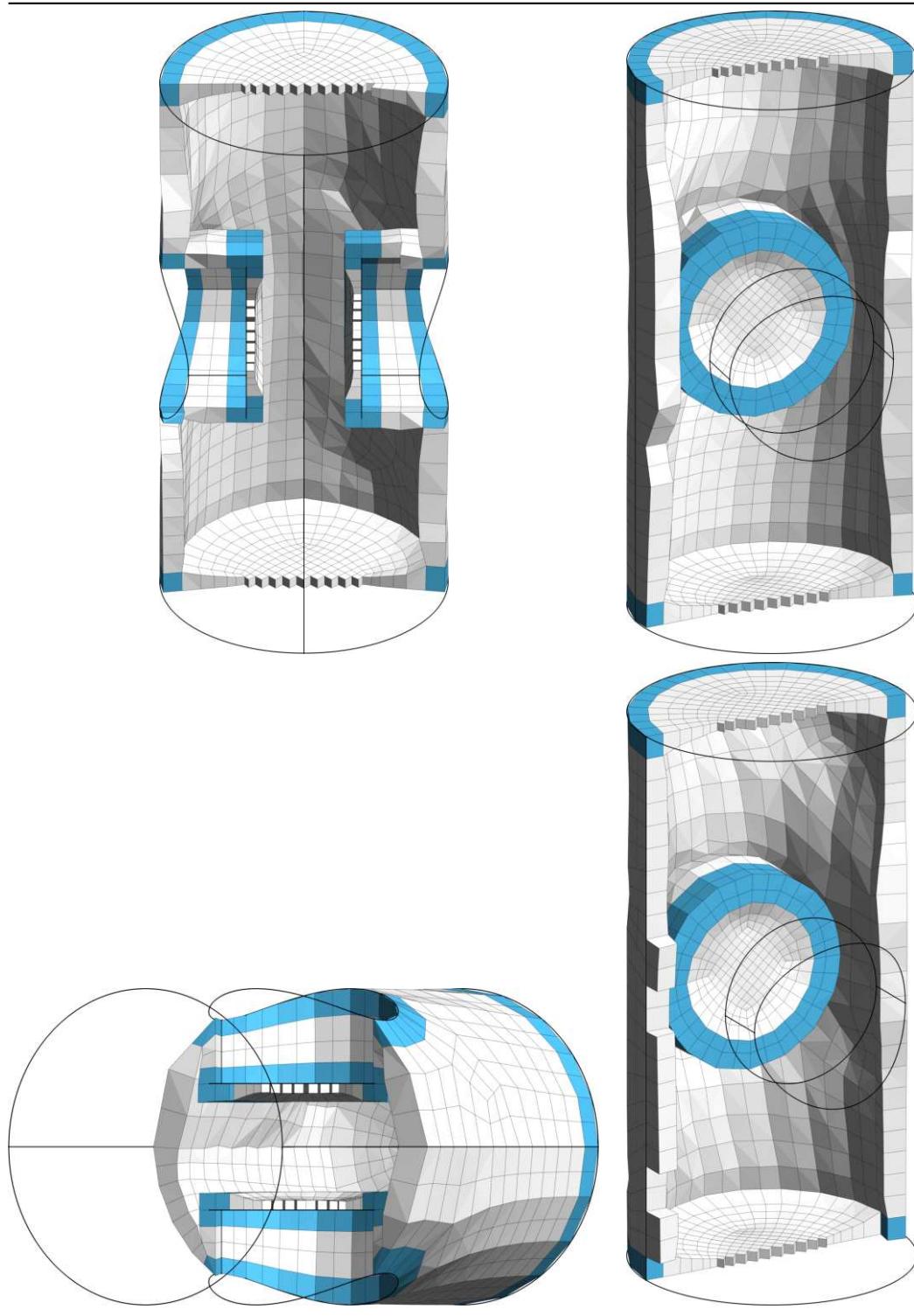
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
678	534	0.590	0.93	0.96	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.89183s	4276	2136	123.796	-	-	0.234	0.85	0.91
Ours	0.000689s / 0.190826s	4116	2056	0	0	0	0.522	0.92	0.95

Figures:



Model: B76

CAD: 28 corners, 42 curves, 16 surfaces, 1 volume

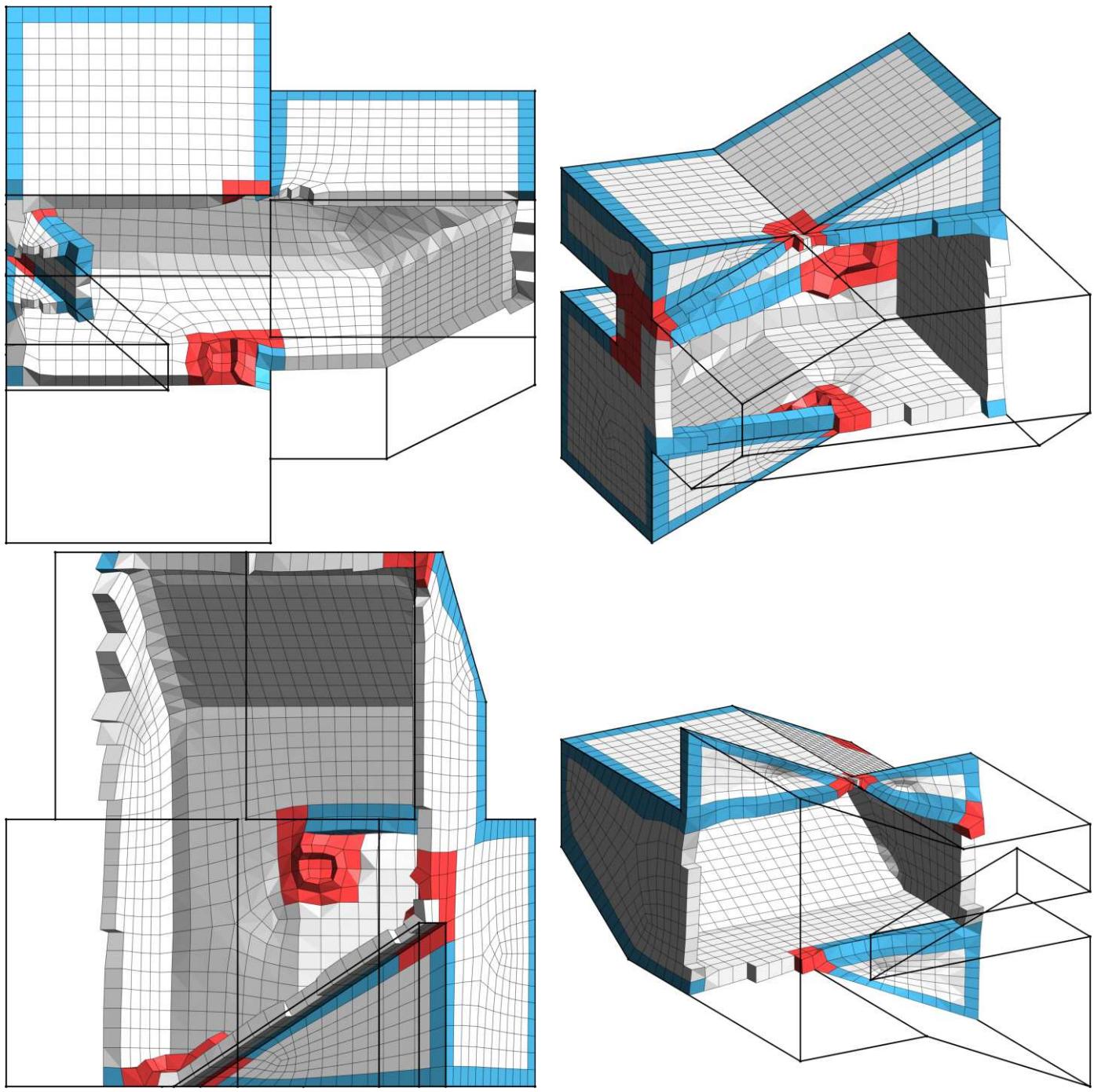
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1042	774	0.281	0.90	0.96	9

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.5337s	6196	3096	206.123	-	-	0.191	0.81	0.86
Ours	3.23802s / 0.631418s	5804	2900	28.5648	4	32	0.279	0.88	0.93

Figures:



Model: B7

CAD: 4 corners, 7 curves, 4 surfaces, 1 volume

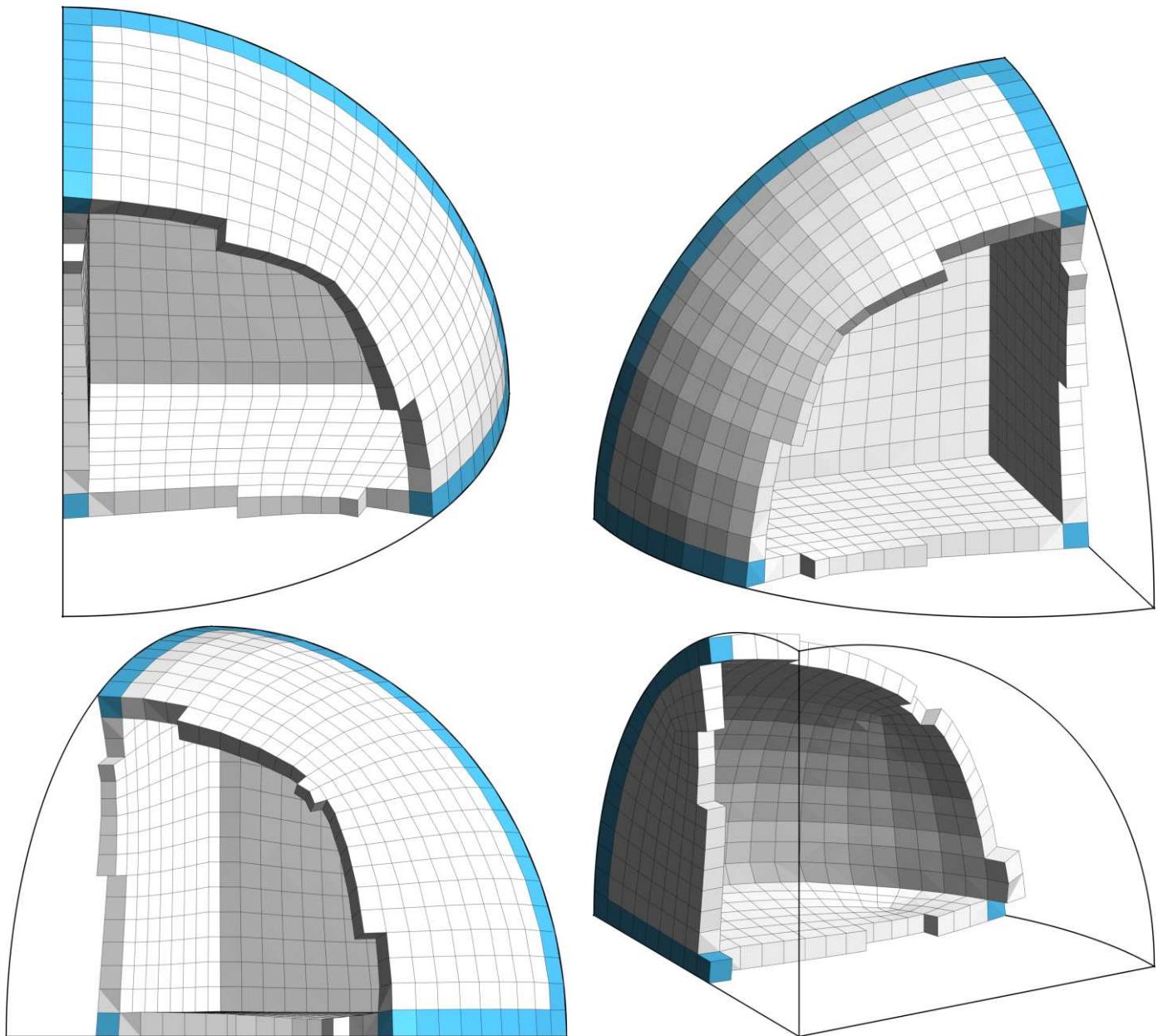
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
352	288	0.835	0.97	0.98	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.372292s	2308	1152	62.9217	-	-	0.552	0.88	0.97
Ours	0.000403s / 0.048584s	2080	1036	0	0	0	0.852	0.98	0.98

Figures:



Model: B8

CAD: 10 corners, 16 curves, 7 surfaces, 1 volume

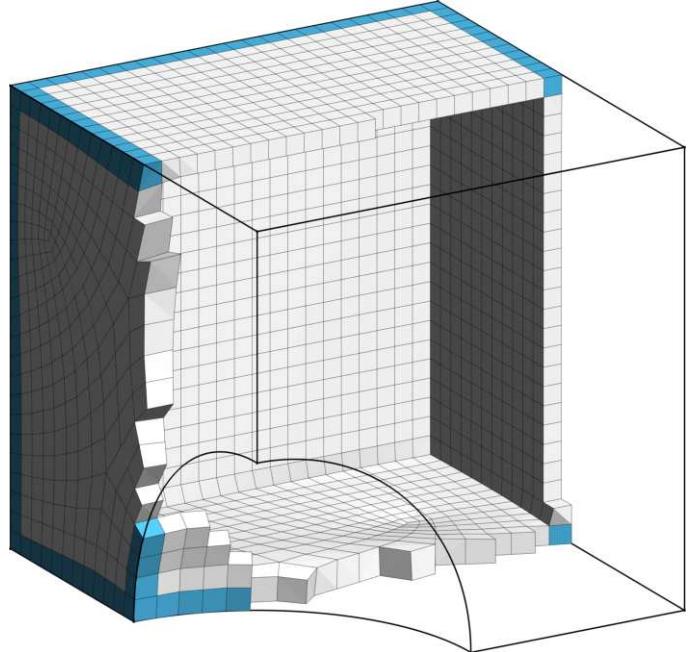
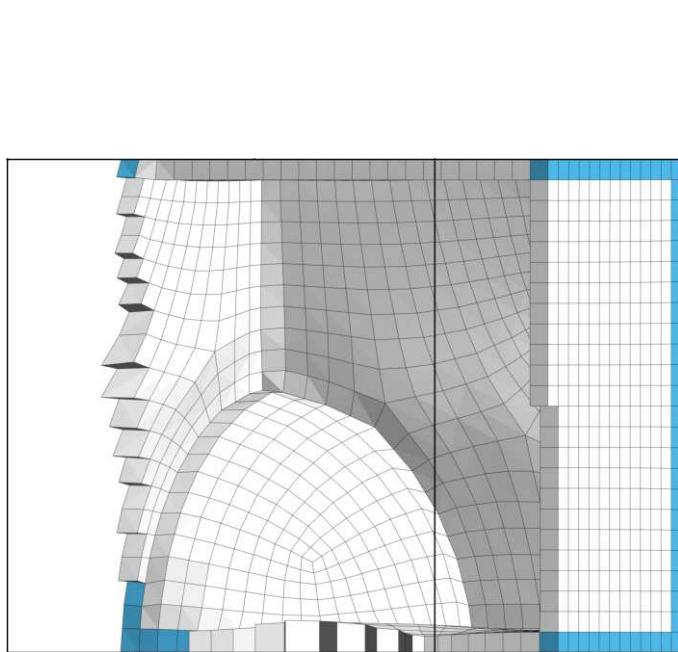
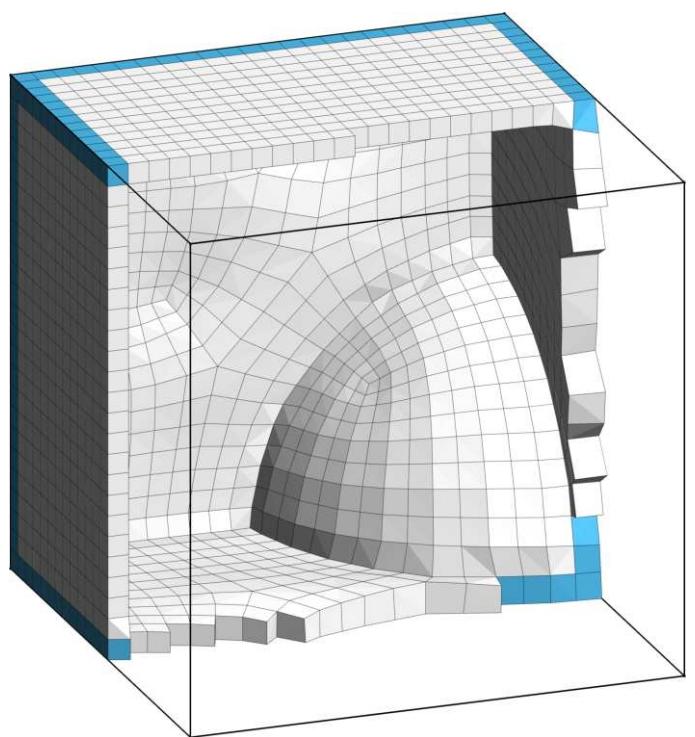
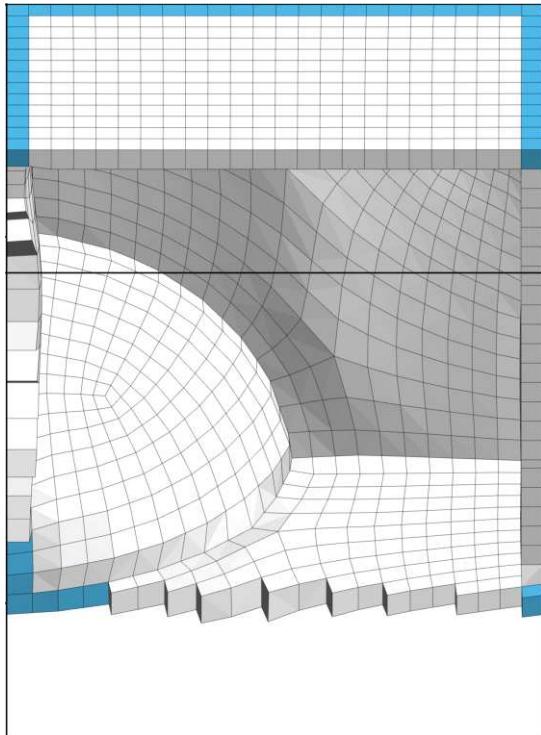
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
943	784	0.658	0.97	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.13862s	6276	3136	149.081	-	-	0.557	0.89	0.97
Ours	0.00092s / 0.163244s	5698	2842	0	0	0	0.737	0.98	0.99

Figures:



Model: B9

CAD: 2 corners, 5 curves, 3 surfaces, 1 volume

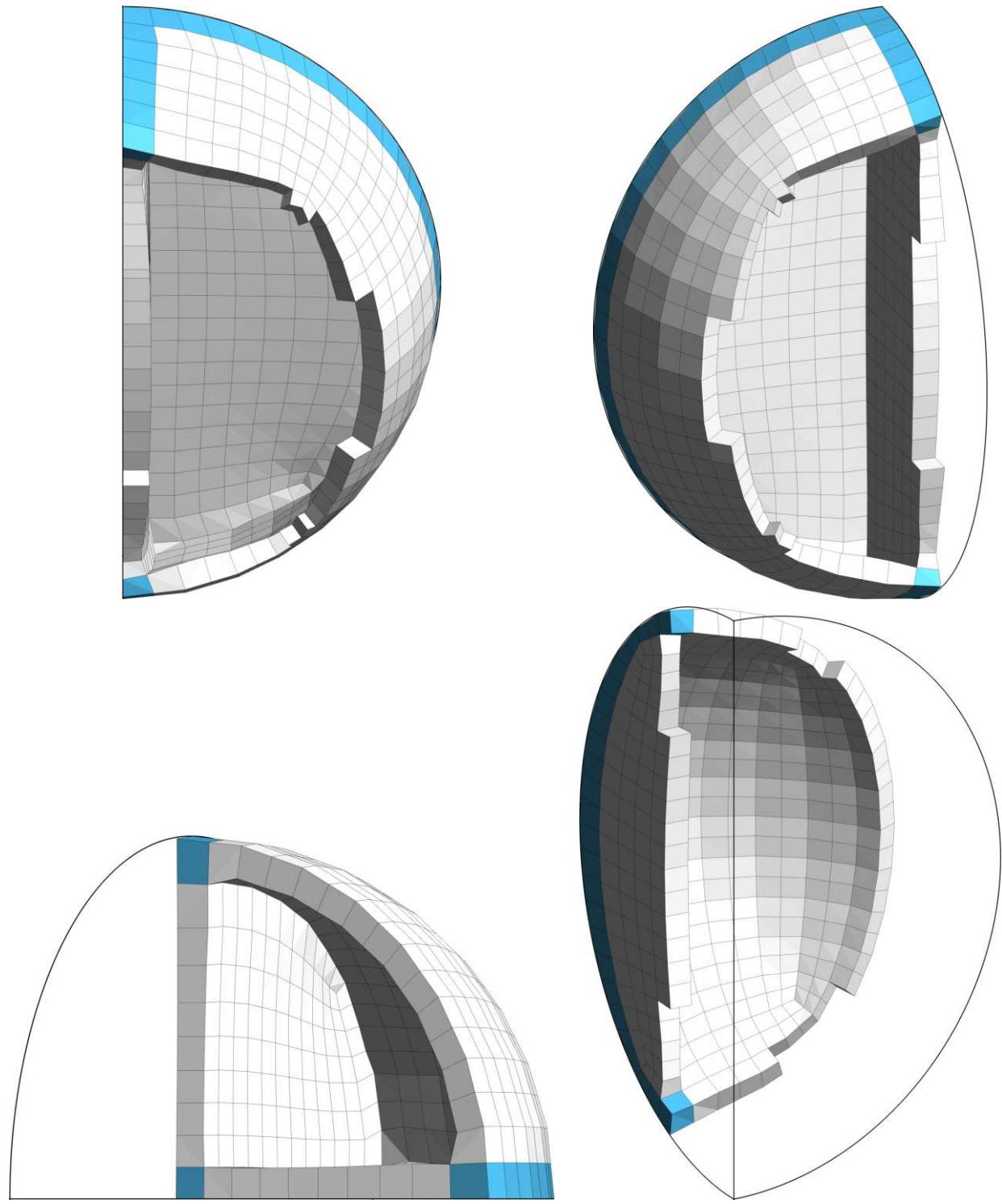
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
279	228	0.799	0.95	0.97	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 0.359007s	1828	912	53.4486	-	-	0.493	0.87	0.96
Ours	0.000351s / 0.052201s	1642	818	0	0	0	0.758	0.95	0.97

Figures:



Model: S0

CAD: 29 corners, 44 curves, 17 surfaces, 1 volume

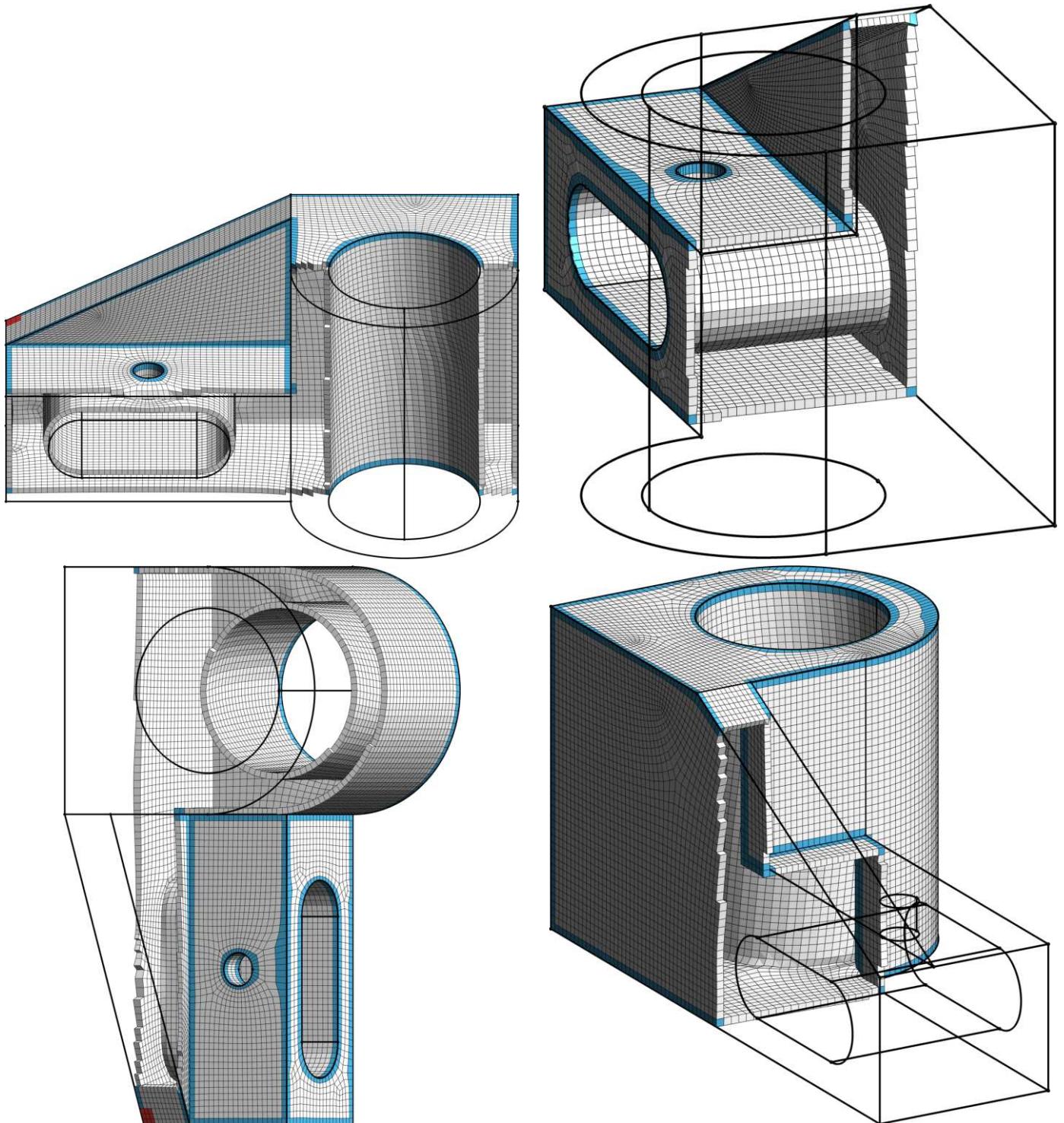
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
5864	5165	0.416	0.95	0.99	1

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 7.10194s	41312	20660	586.618	-	-	0.283	0.91	0.98
Ours	0.00965s / 1.50265s	39440	19724	8	1	7	0.377	0.95	0.99

Figures:



Model: S1

CAD: 27 corners, 39 curves, 14 surfaces, 1 volume

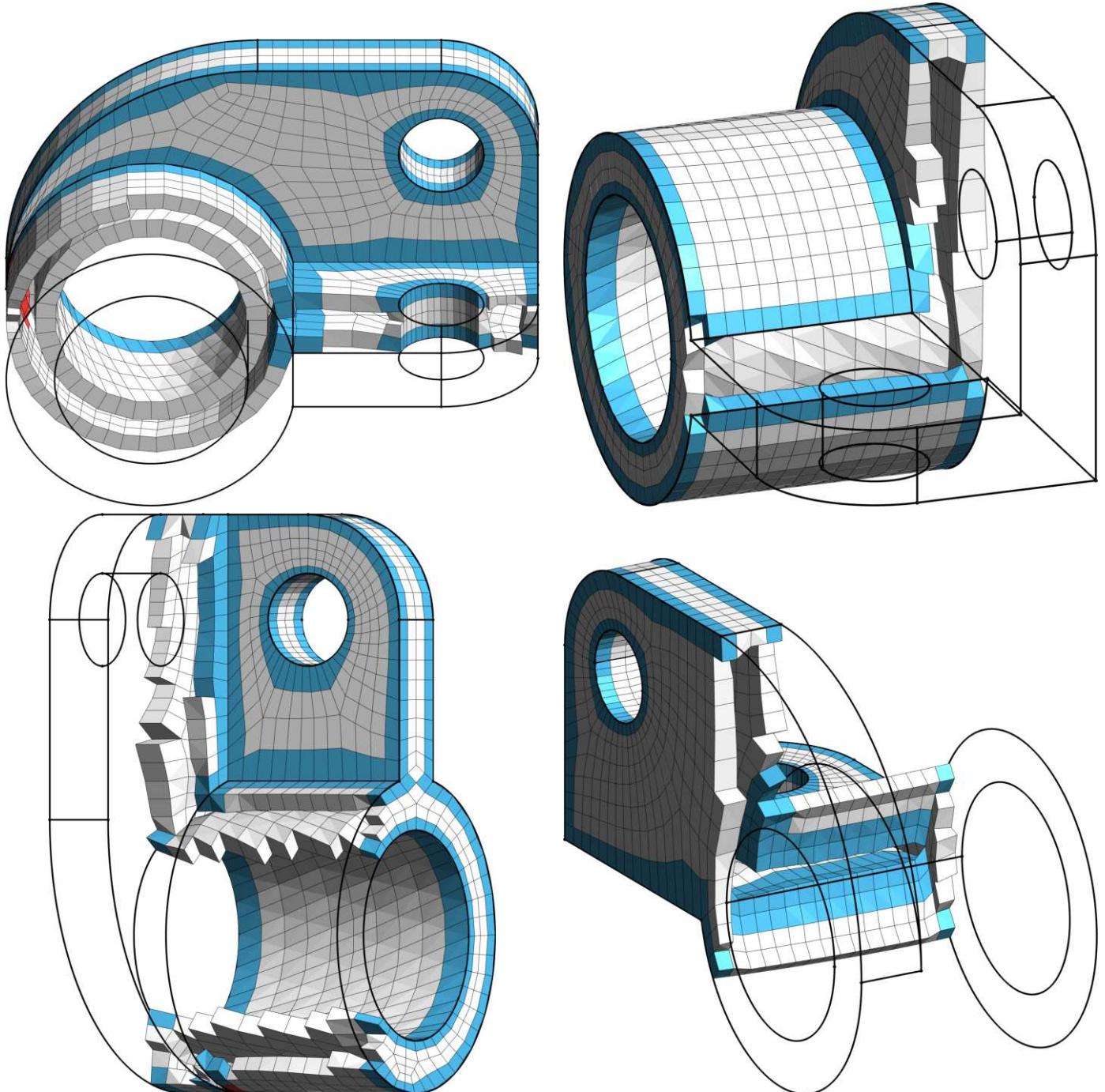
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1089	790	0.034	0.84	0.85	1

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 4.14543s	6312	3160	277.788	-	-	0.021	0.76	0.77
Ours	0.029886s / 0.802235s	5476	2742	5.50214	1	5	0.026	0.84	0.86

Figures:



Model: S20

CAD: 51 corners, 76 curves, 27 surfaces, 1 volume

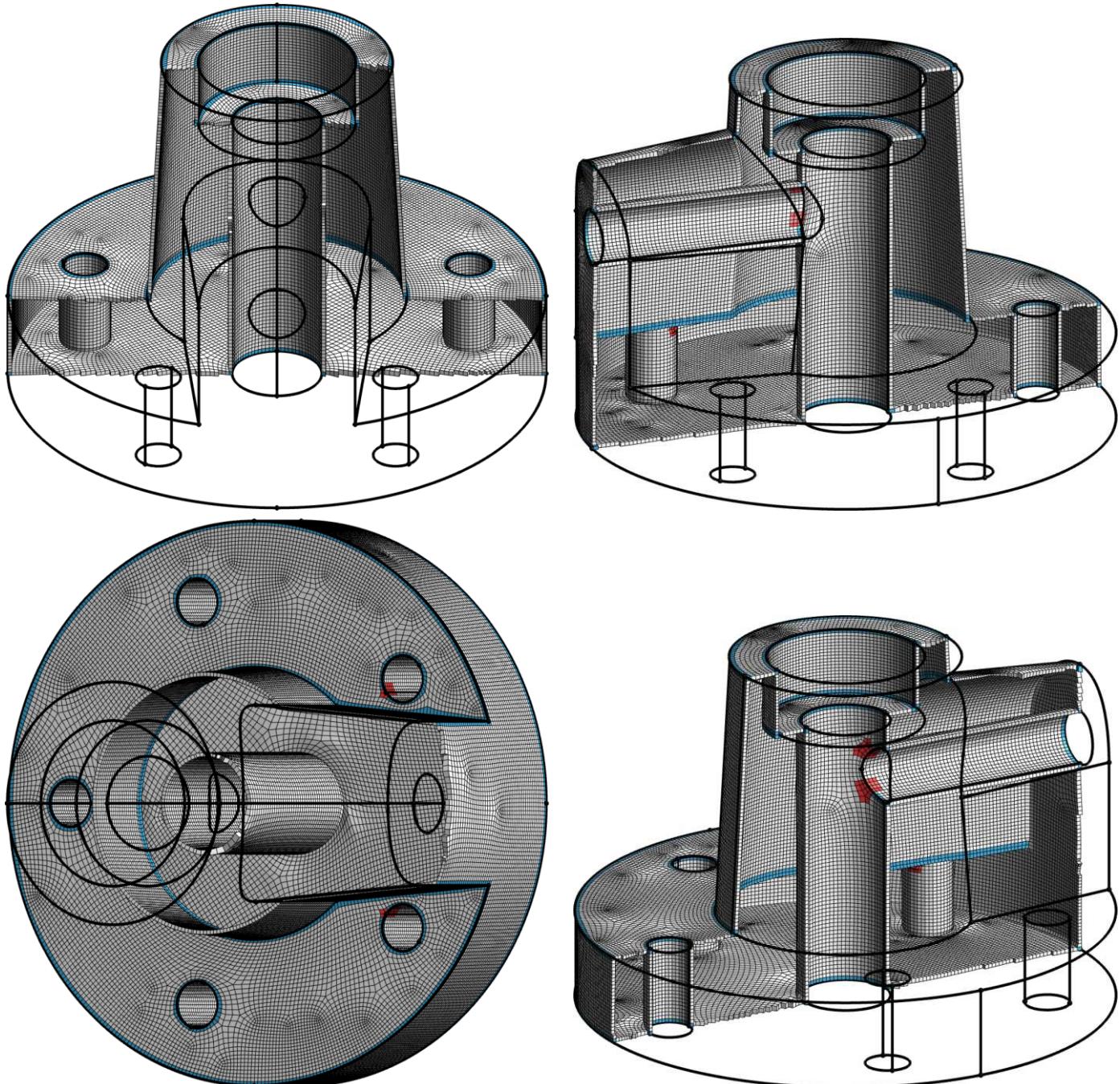
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
18450	16861	0.408	0.97	0.99	8

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 10.3372s	134864	67444	1095.39	-	-	0.402	0.94	0.98
Ours	3.05701s / 3.79284s	132092	66060	35.2334	5	44	0.480	0.97	0.99

Figures:



Model: S22

CAD: 52 corners, 80 curves, 30 surfaces, 1 volume

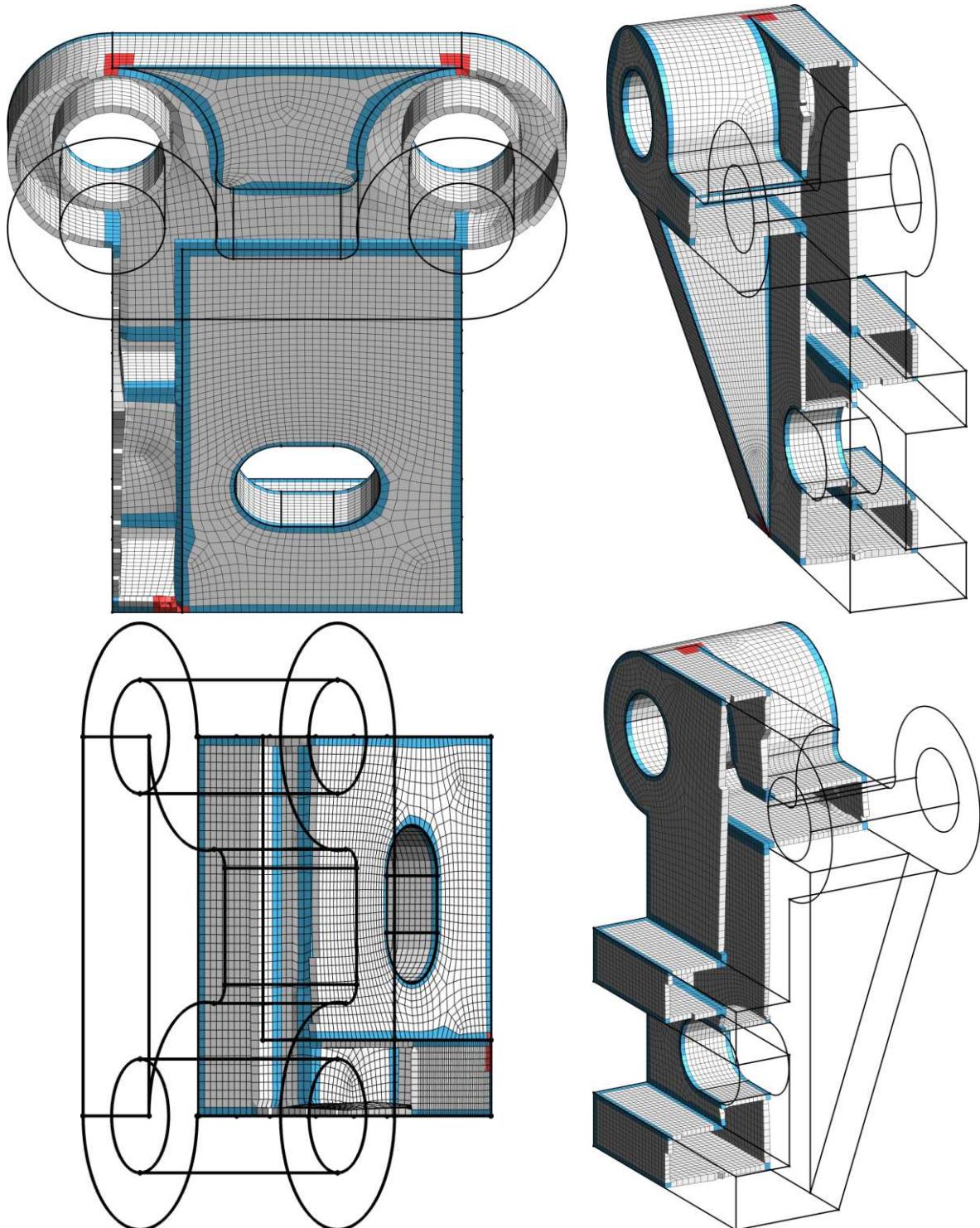
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
6178	5196	0.056	0.93	0.97	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 8.96024s	41560	20784	805.841	-	-	0.033	0.87	0.96
Ours	0.077325s / 1.93877s	39878	19944	21.5839	4	22	0.044	0.93	0.97

Figures:



Model: S23

CAD: 54 corners, 82 curves, 30 surfaces, 1 volume

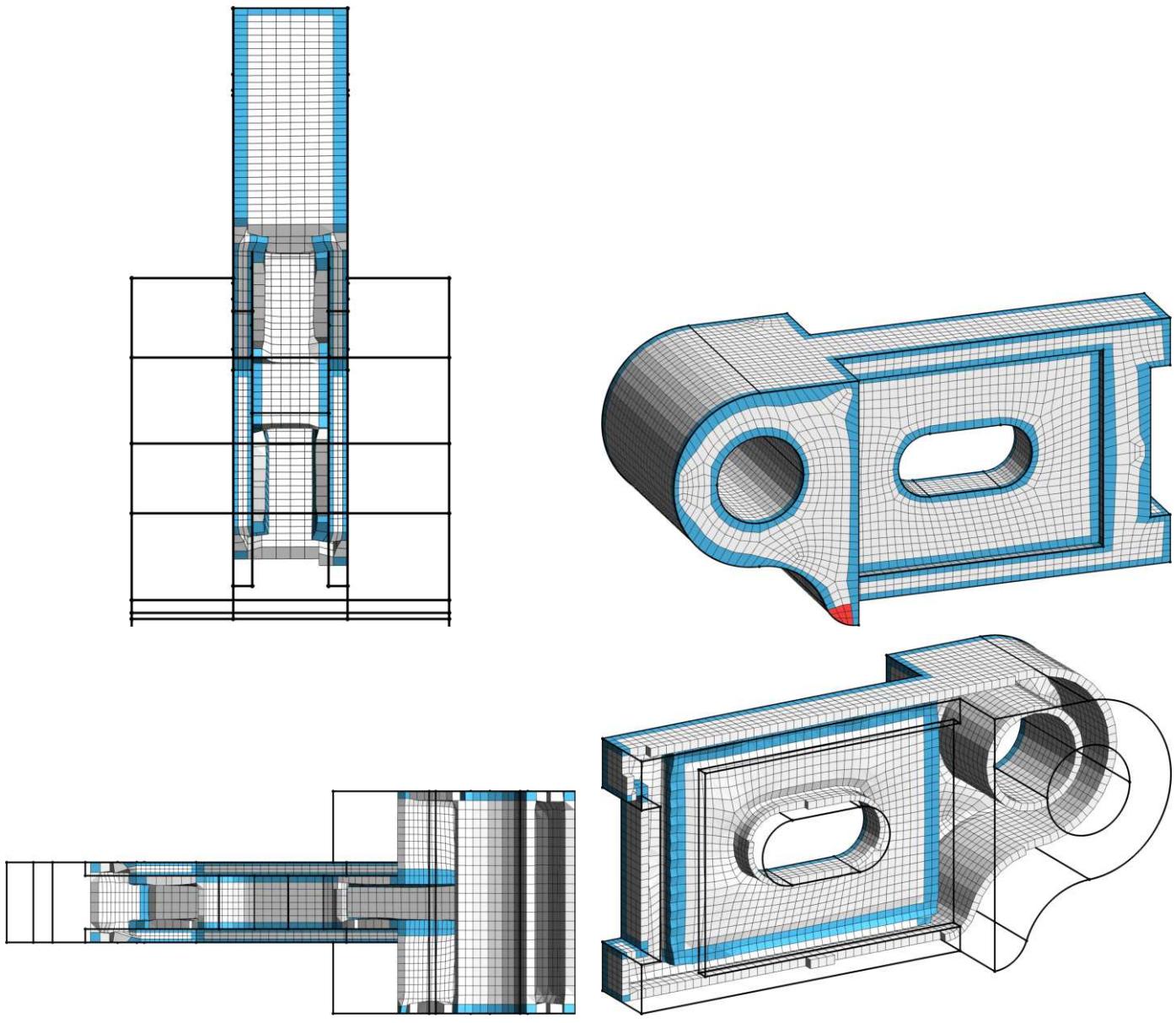
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2818	2130	0.302	0.92	0.96	2

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 4.54904s	17036	8520	583.565	-	-	0.262	0.81	0.88
Ours	0.003465s / 1.00953s	15930	7966	17.714	2	14	0.266	0.91	0.96

Figures:



Model: S24

CAD: 43 corners, 65 curves, 24 surfaces, 1 volume

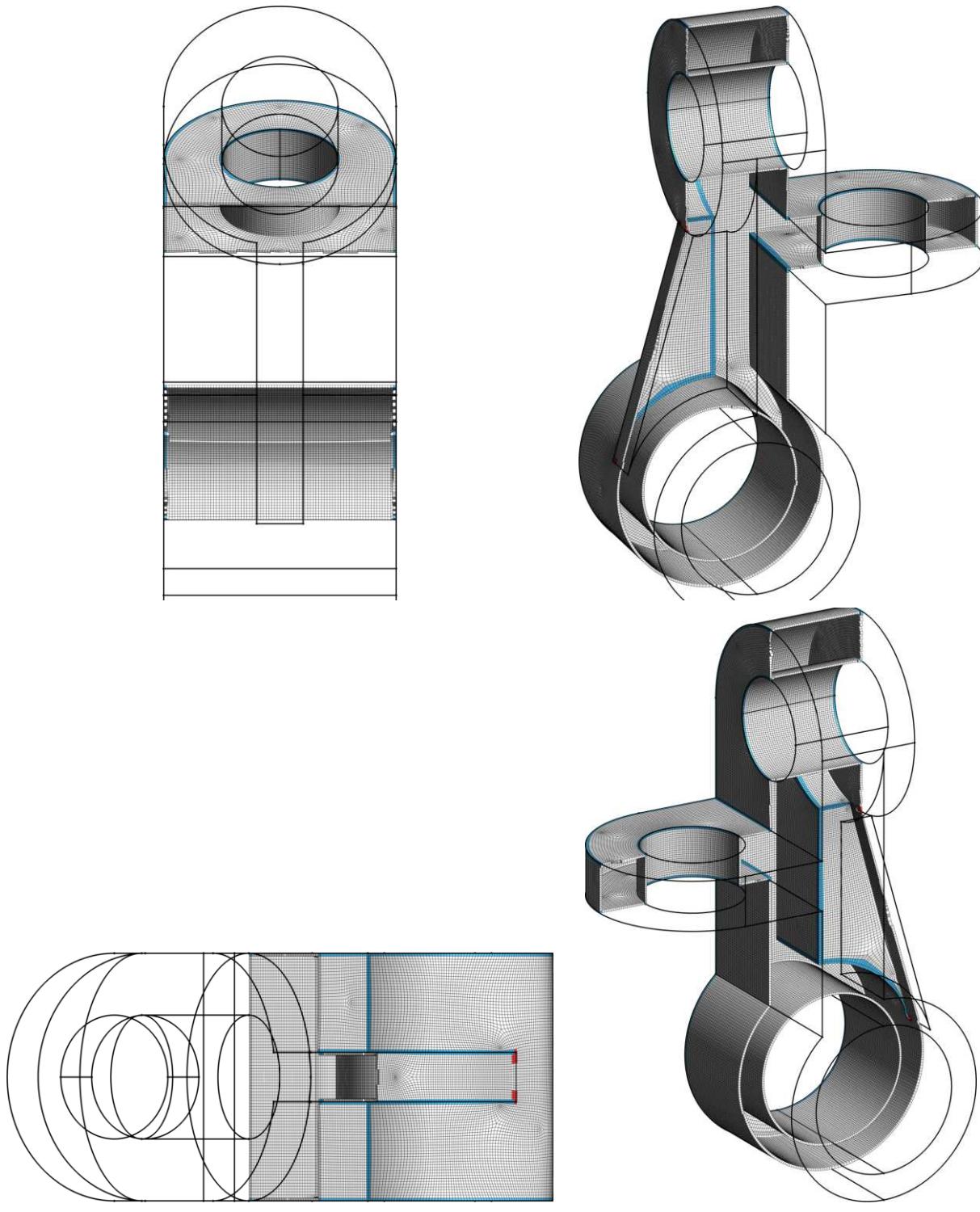
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
29084	26878	0.004	0.97	0.99	19

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 58.8665s	215016	107512	1878.62	-	-	-0.40	0.94	0.99
Ours	3.52079s / 8.50243s	210532	105276	41.2256	5	49	-0.46	0.98	0.99

Figures:



Model: S25

CAD: 58 corners, 88 curves, 32 surfaces, 1 volume

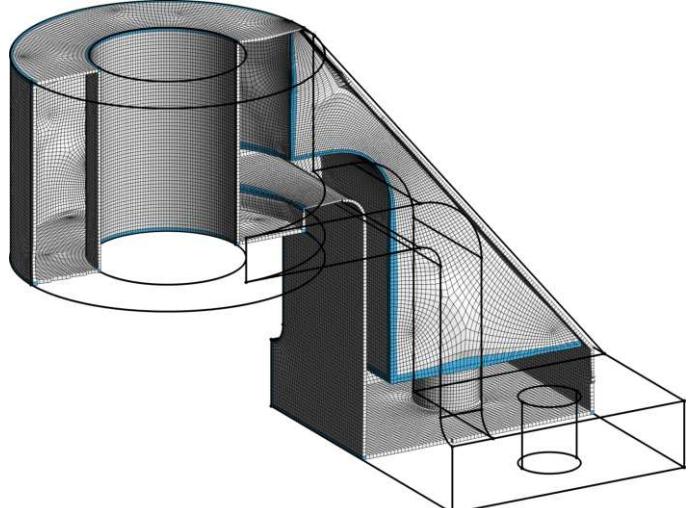
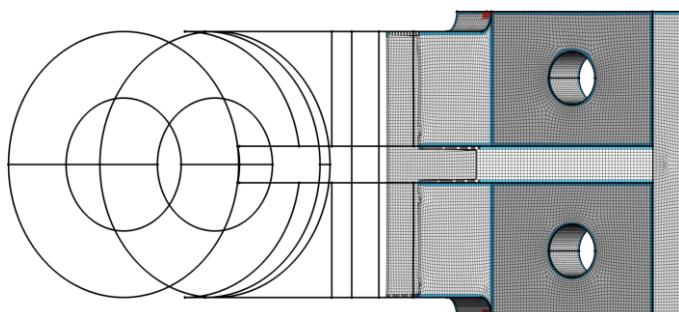
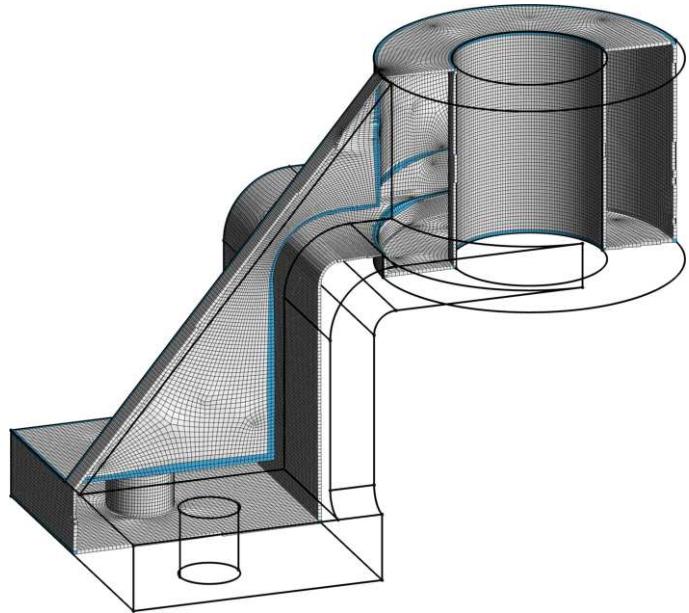
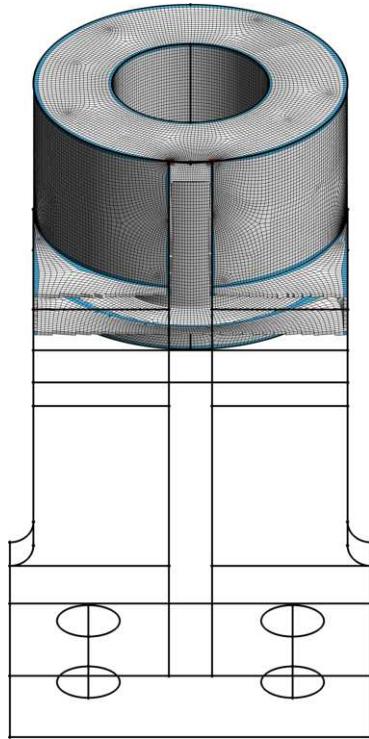
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
24646	22348	0.003	0.95	0.97	12

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 23.7216s	178776	89392	1874.43	-	-	-0.41	0.92	0.97
Ours	1.90309s / 6.20762s	175238	87622	50.0644	8	54	-0.13	0.95	0.98

Figures:



Model: S26

CAD: 71 corners, 107 curves, 38 surfaces, 1 volume

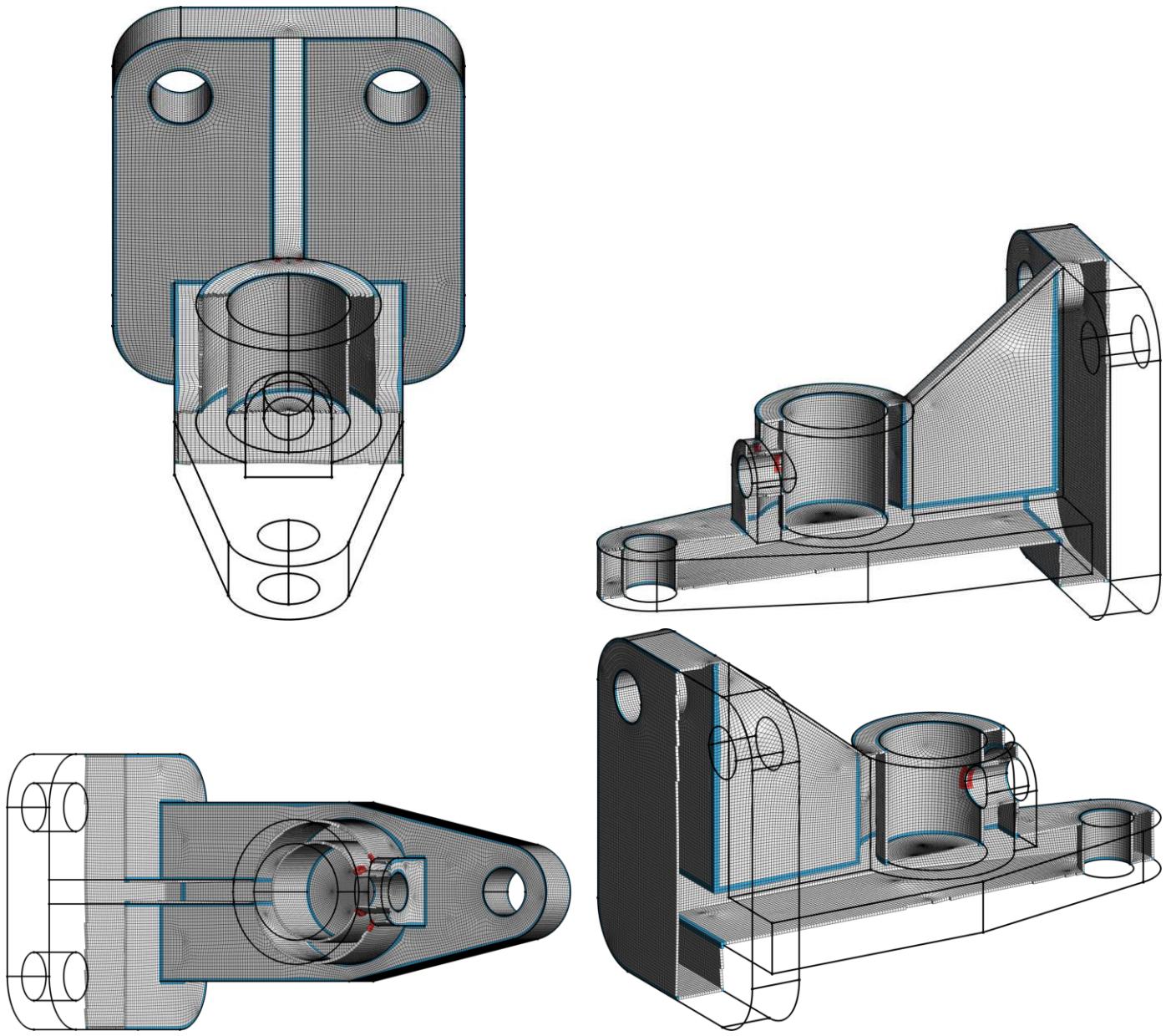
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
22399	20253	0.012	0.97	0.99	11

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 39.0501s	162012	81012	1813.97	-	-	0.003	0.94	0.99
Ours	3.29338s / 7.1493s	158538	79278	41.0257	5	48	-0.57	0.97	0.99

Figures:



Model: S27

CAD: 94 corners, 144 curves, 52 surfaces, 1 volume

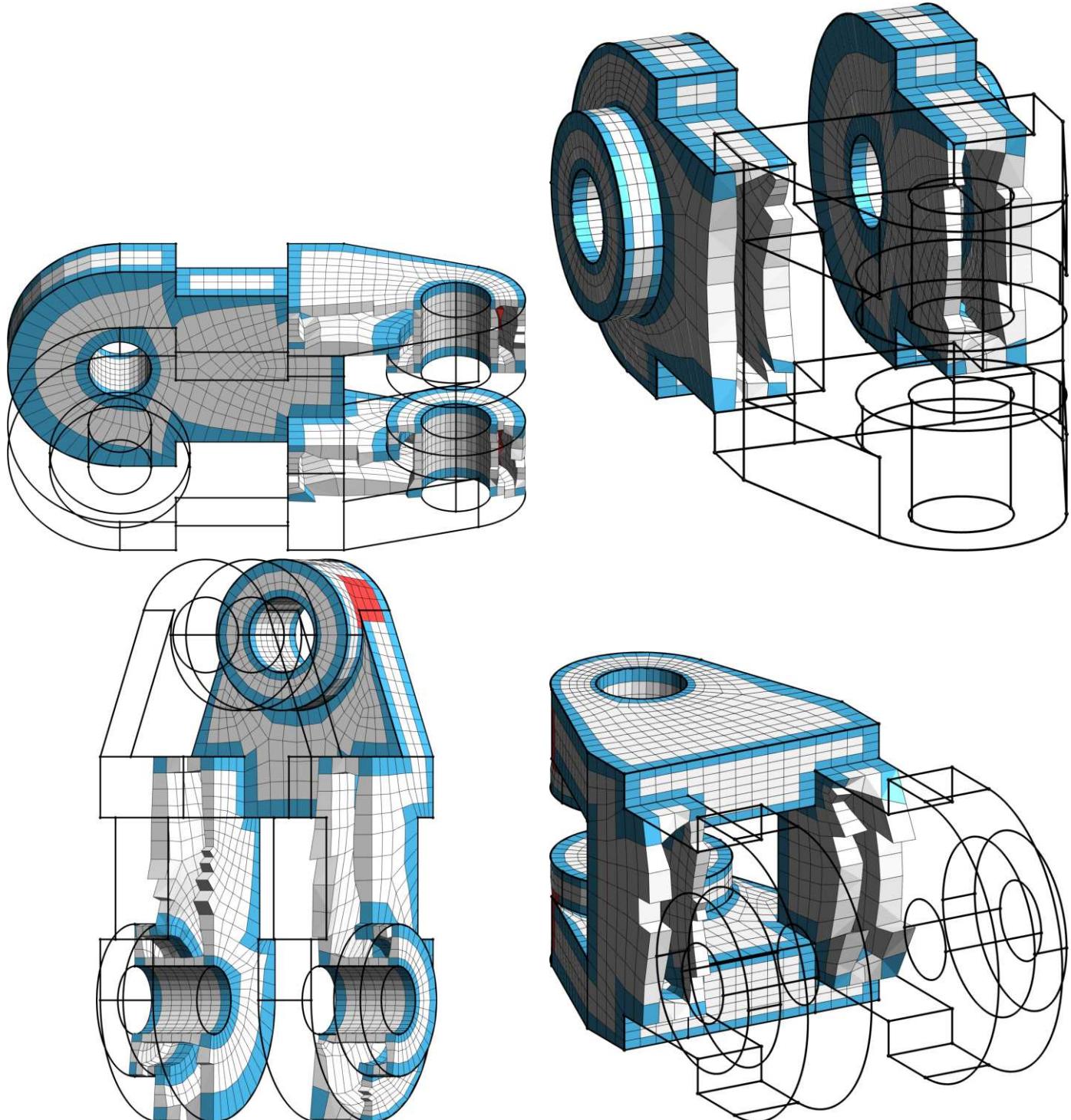
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2131	1429	0.071	0.82	0.84	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 5.52545s	11416	5716	583.192	-	-	0.048	0.73	0.75
Ours	0.05347s / 1.85332s	9976	5004	22.5454	4	20	0.064	0.81	0.85

Figures:



Model: S31

CAD: 76 corners, 114 curves, 42 surfaces, 1 volume

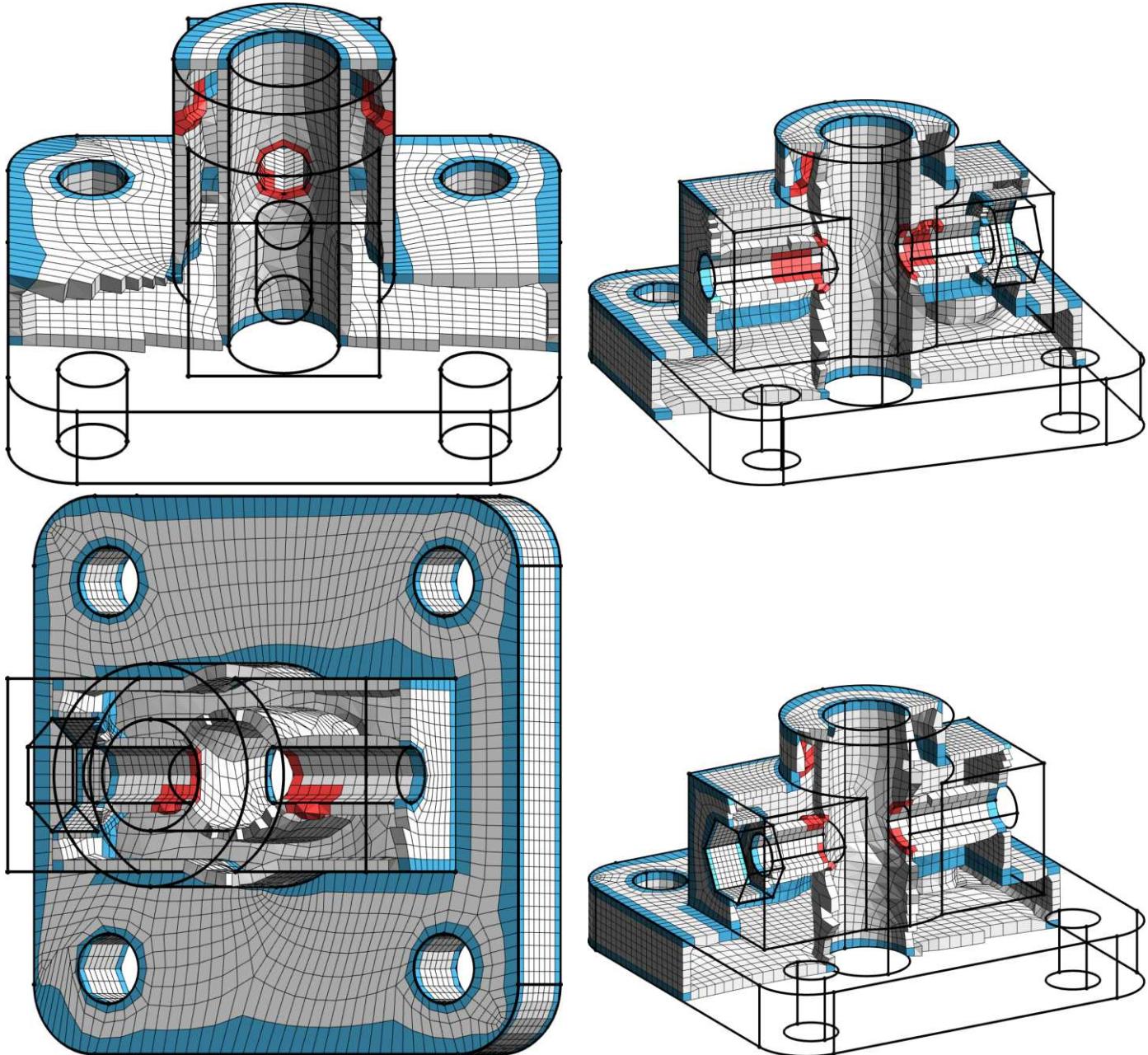
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
3015	2237	0.188	0.89	0.96	12

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 5.21438s	17872	8948	551.047	-	-	0.172	0.80	0.84
Ours	8.23407s / 1.24656s	16580	8304	24.739	4	38	0.193	0.88	0.92

Figures:



Model: S33

CAD: 25 corners, 39 curves, 16 surfaces, 1 volume

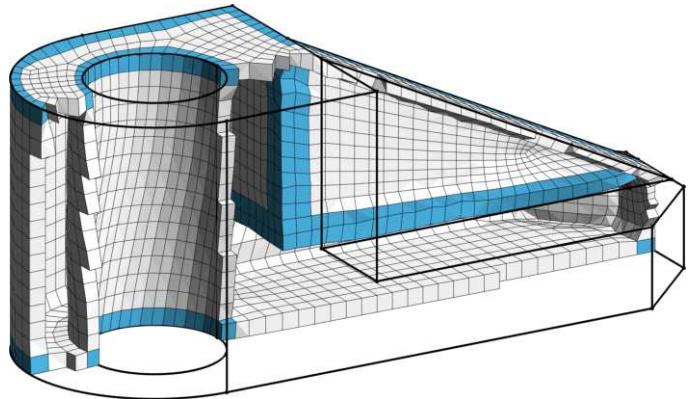
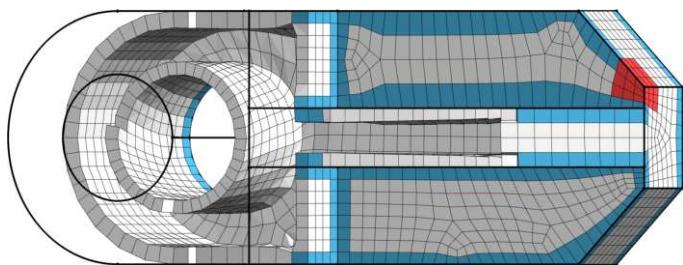
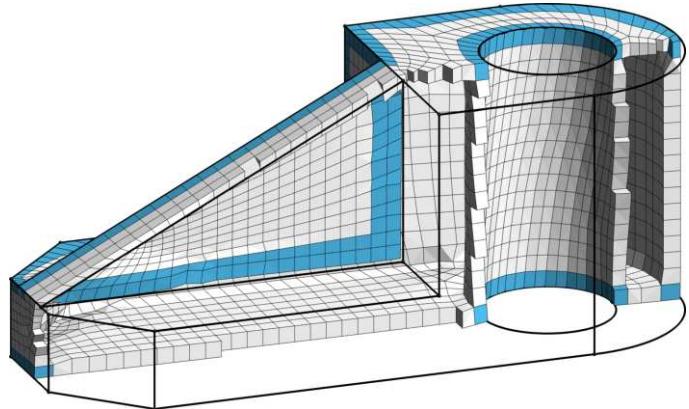
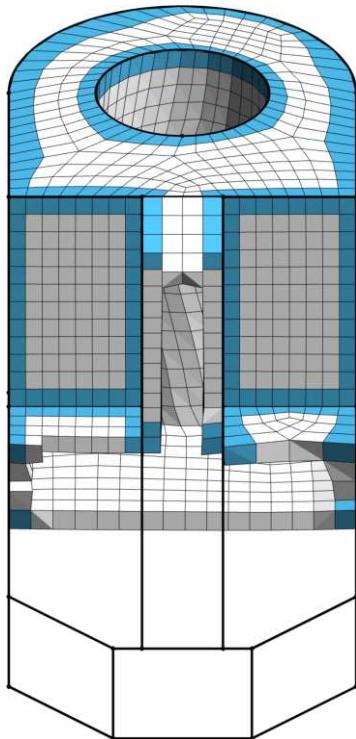
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1200	915	0.430	0.88	0.91	1

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.96777s	7320	3660	236.663	-	-	0.315	0.82	0.86
Ours	0.00312s / 0.433754s	6748	3376	8	1	7	0.355	0.89	0.90

Figures:



Model: S34

CAD: 77 corners, 123 curves, 46 surfaces, 1 volume

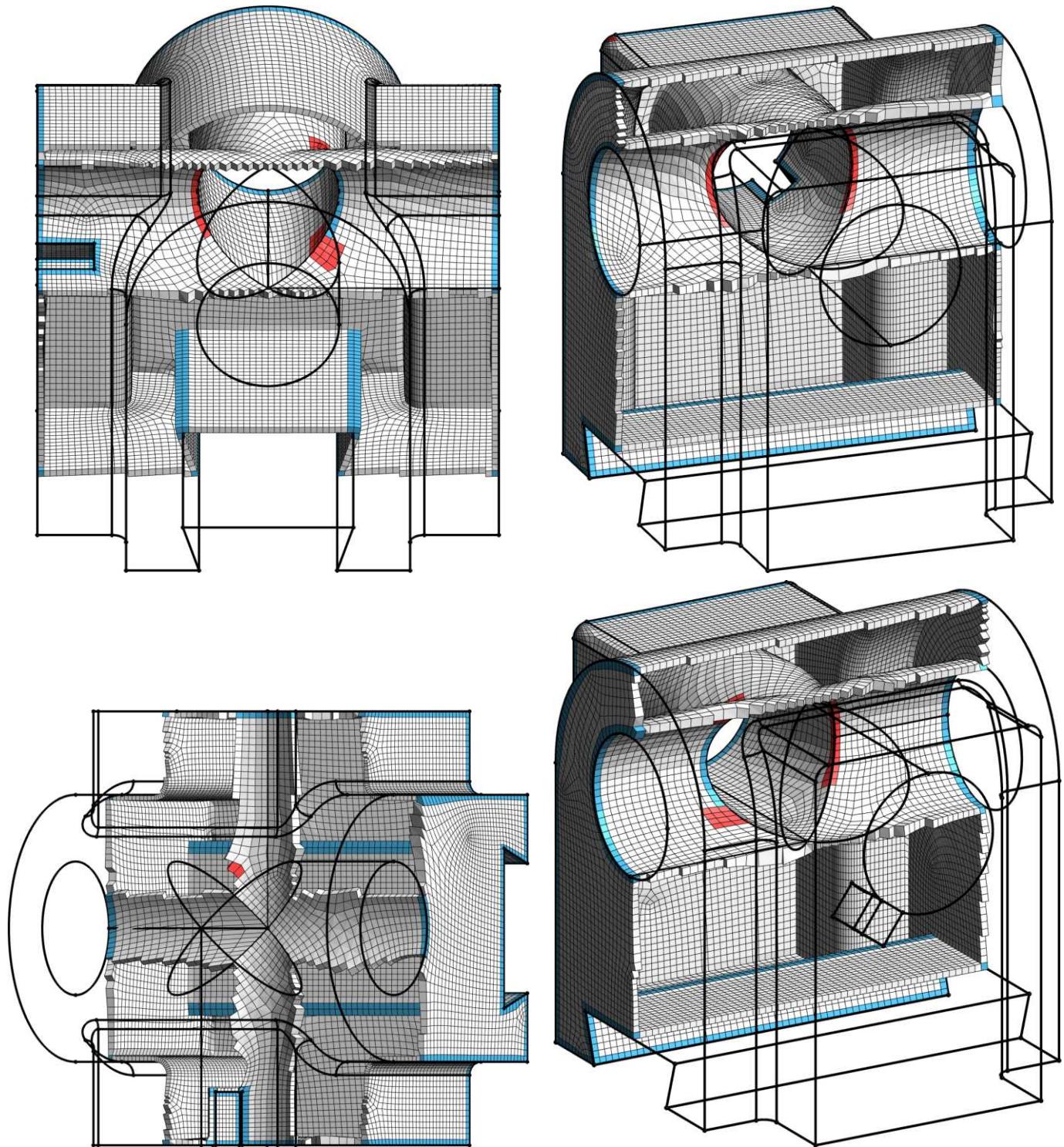
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
9119	7741	0.106	0.87	0.95	11

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 8.79678s	61920	30964	839.494	-	-	0.019	0.84	0.94
Ours	0.469734s / 4.39962s	59584	29796	51.8409	8	54	0.019	0.88	0.95

Figures:



Model: S35

CAD: 18 corners, 27 curves, 11 surfaces, 1 volume

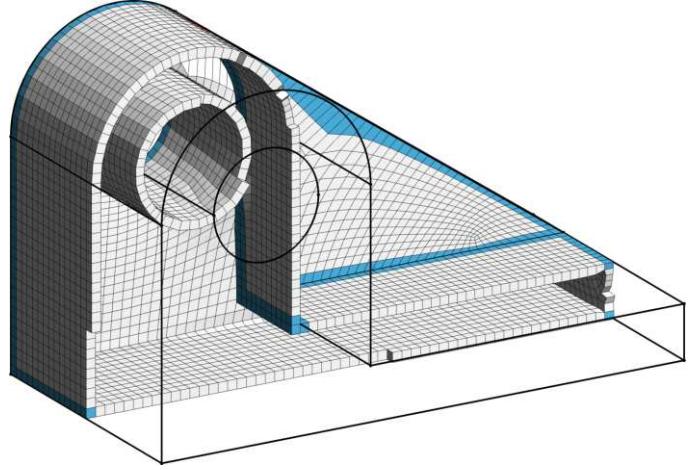
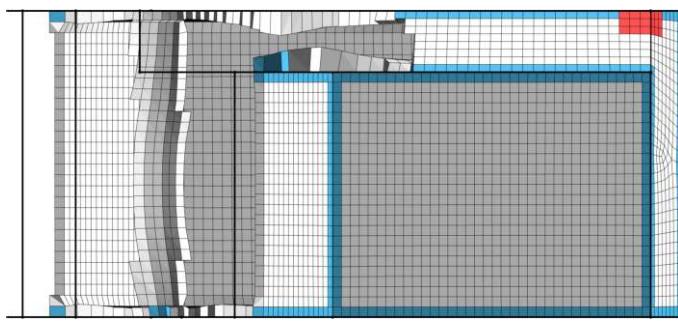
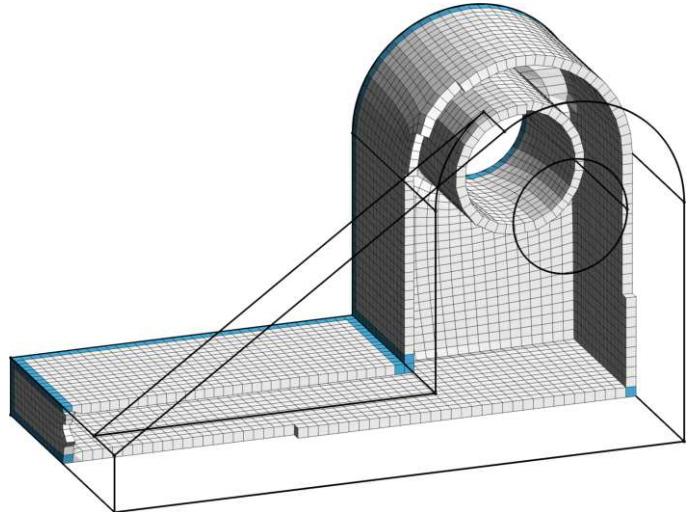
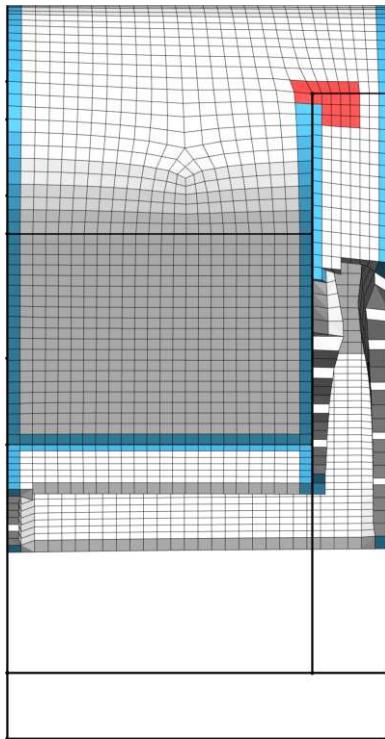
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
19522	18192	0.655	0.94	0.99	2

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 4.69213s	17592	8796	319.921	-	-	0.037	0.89	0.97
Ours	0.02276s / 0.777896s	16738	8368	13.2496	2	12	0.051	0.95	0.98

Figures:



Model: S36

CAD: 35 corners, 53 curves, 20 surfaces, 1 volume

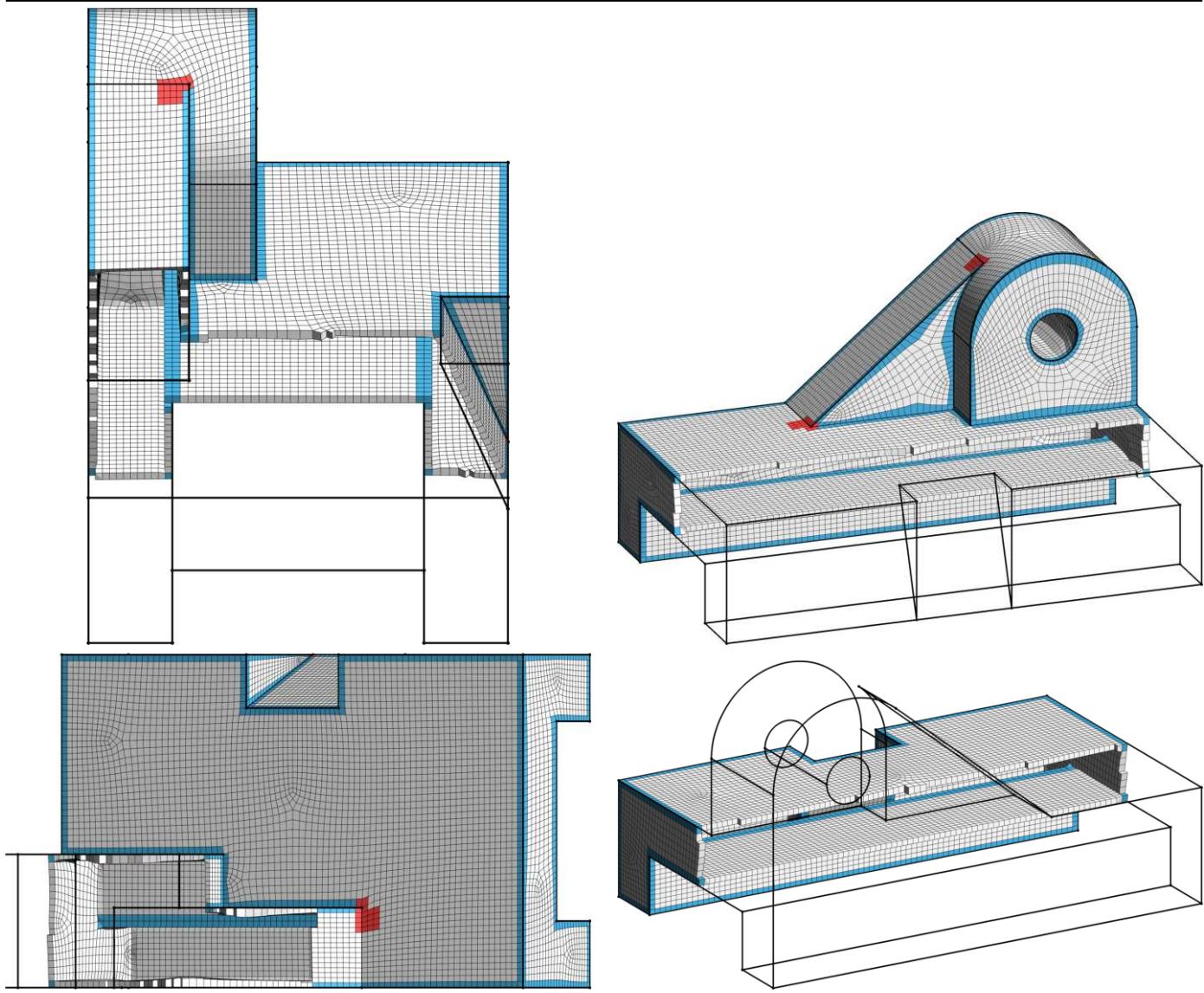
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
5620	4859	-0.30	0.96	0.98	9

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 7.42998s	38872	19436	715.446	-	-	0.029	0.90	0.98
Ours	3.0698s / 1.431s	37410	18704	34.0705	6	37	0.038	0.96	0.98

Figures:



Model: S37

CAD: 20 corners, 30 curves, 13 surfaces, 1 volume

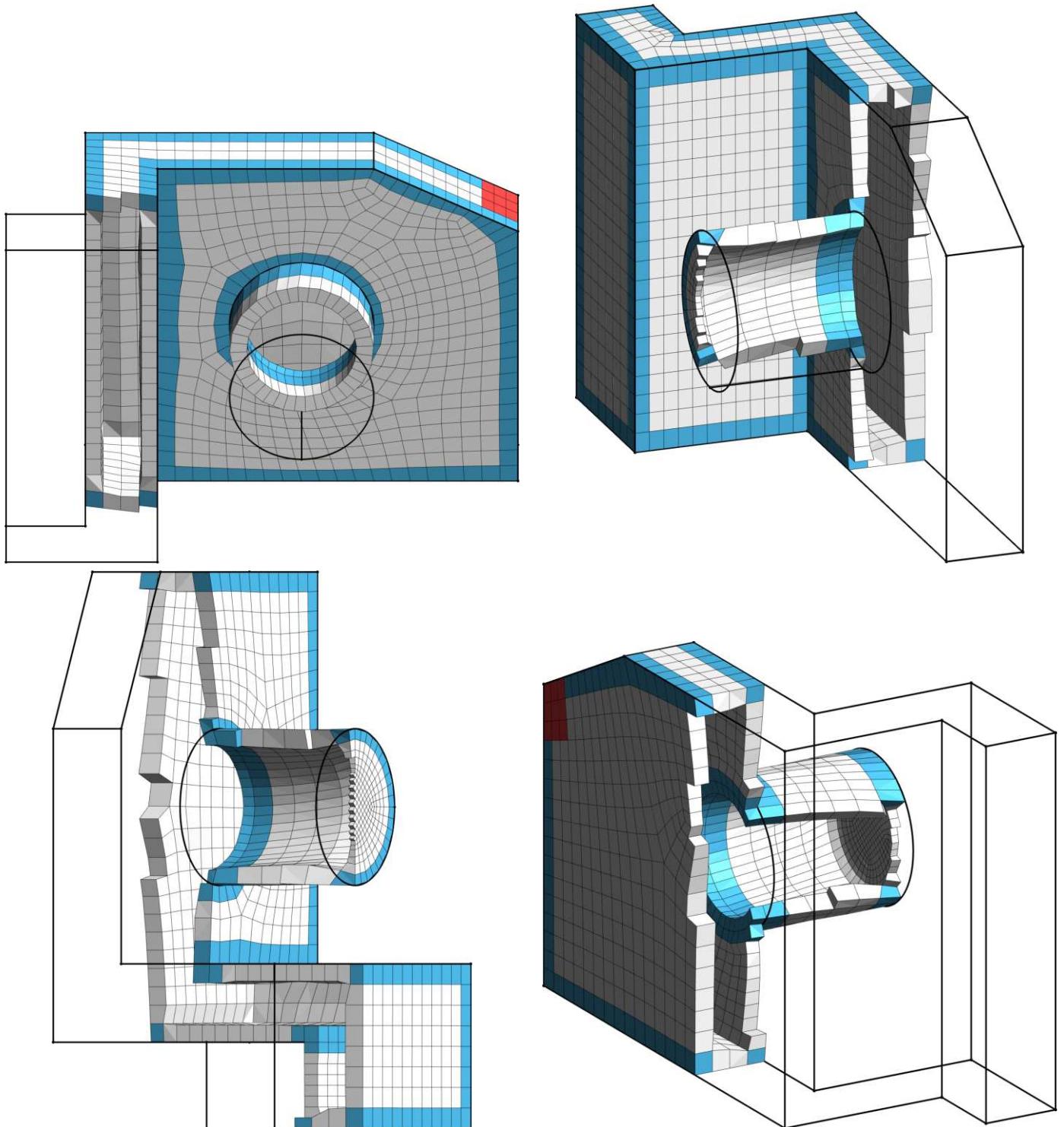
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
922	697	0.591	0.92	0.96	1

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.00372s	5580	2788	210.937	-	-	0.457	0.83	0.87
Ours	0.003351s / 0.277633s	5104	2548	8	1	7	0.380	0.91	0.96

Figures:



Model: S38

CAD: 33 corners, 48 curves, 17 surfaces, 1 volume

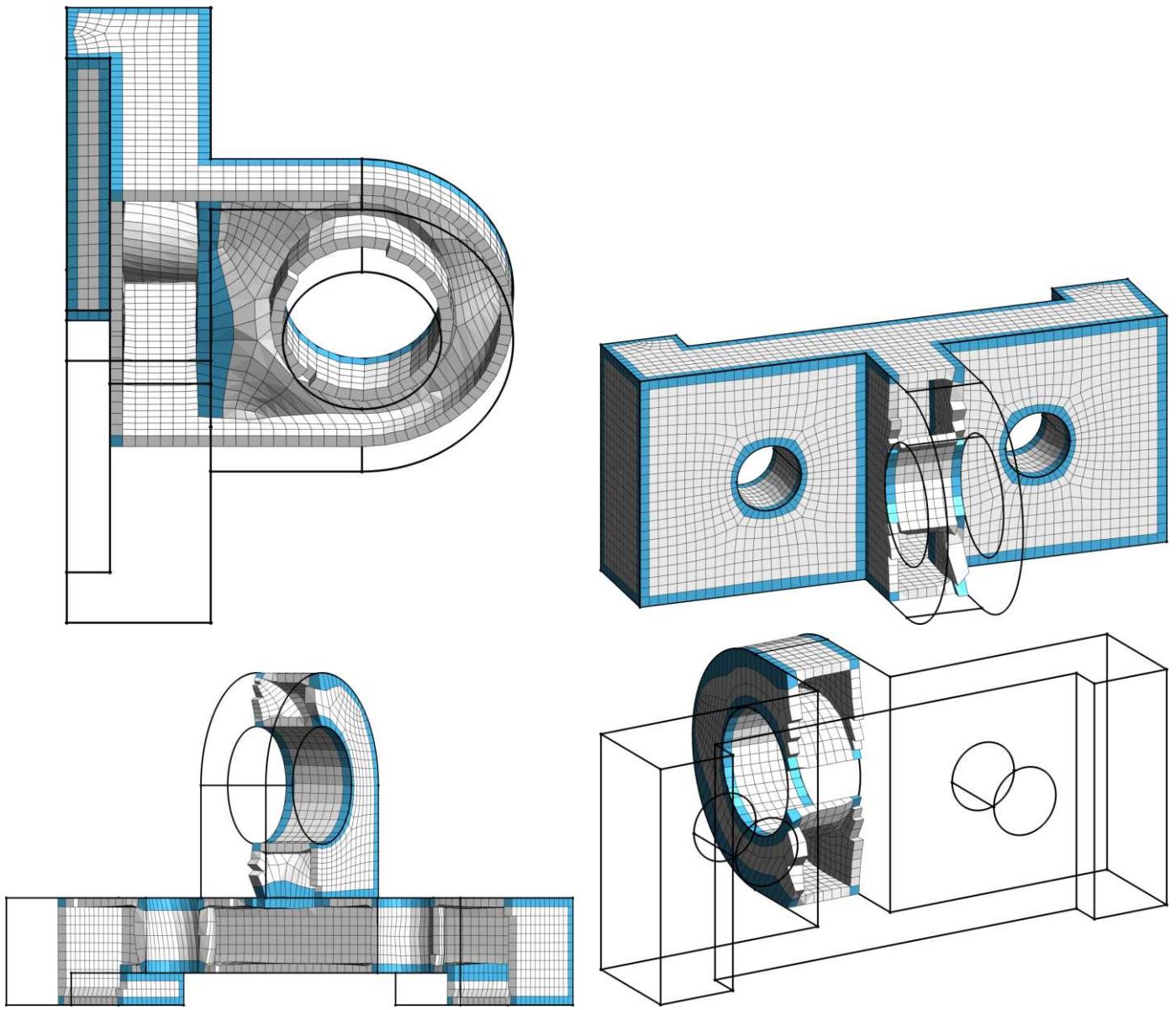
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2137	1673	0.433	0.93	0.98	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 3.89001s	13376	6692	448.228	-	-	0.423	0.83	0.86
Ours	0.002005s / 0.46922s	11980	5992	0	0	0	0.424	0.93	0.98

Figures:



Model: S39

CAD: 28 corners, 41 curves, 15 surfaces, 1 volume

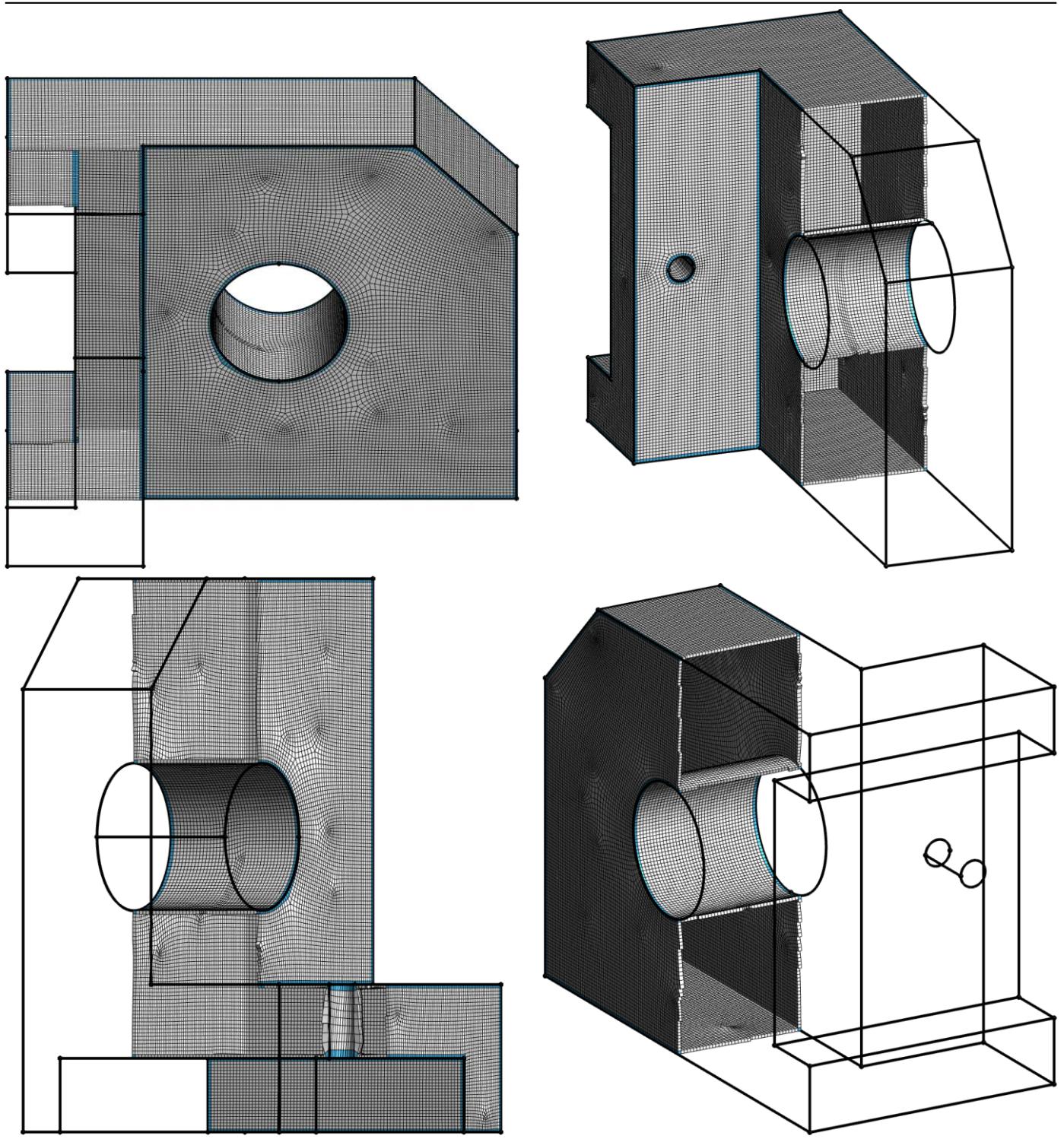
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
19340	18117	0.449	0.99	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 22.1364s	144932	72468	1173.61	-	-	0.457	0.96	0.99
Ours	0.019554s / 3.42131s	141374	70686	0	0	0	0.505	0.99	0.99

Figures:



Model: S3

CAD: 25 corners, 38 curves, 15 surfaces, 1 volume

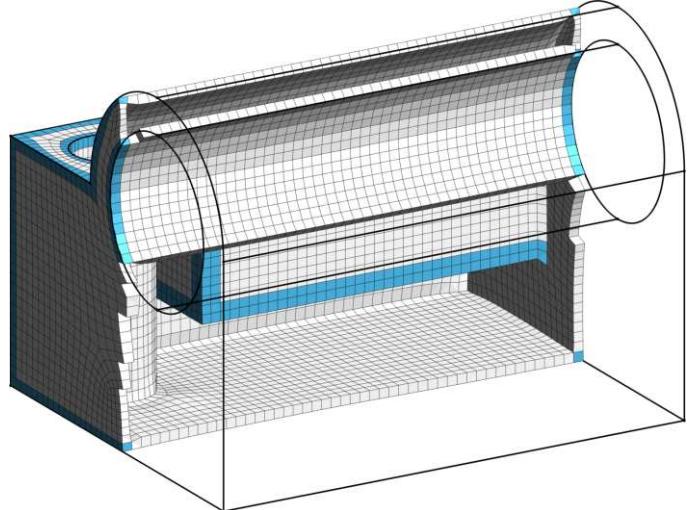
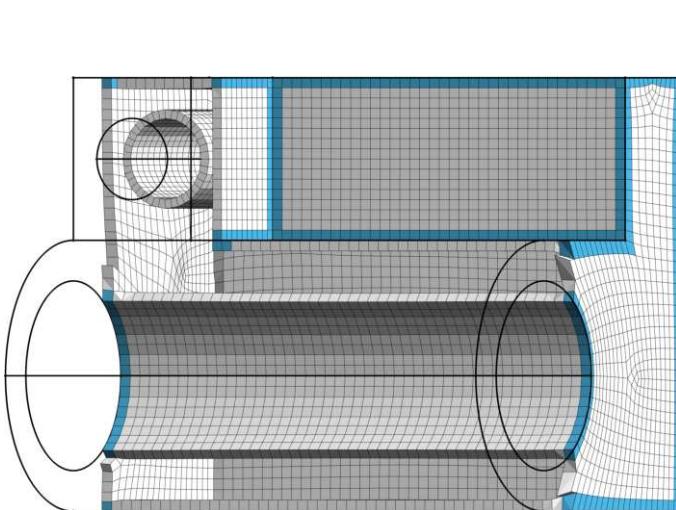
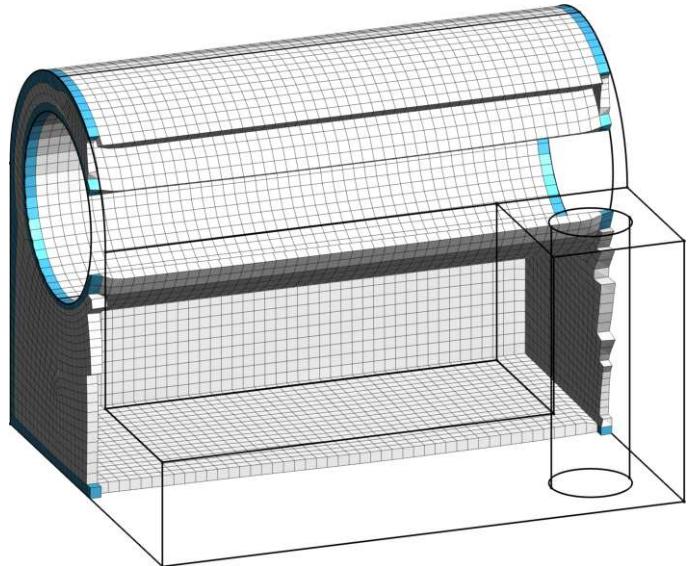
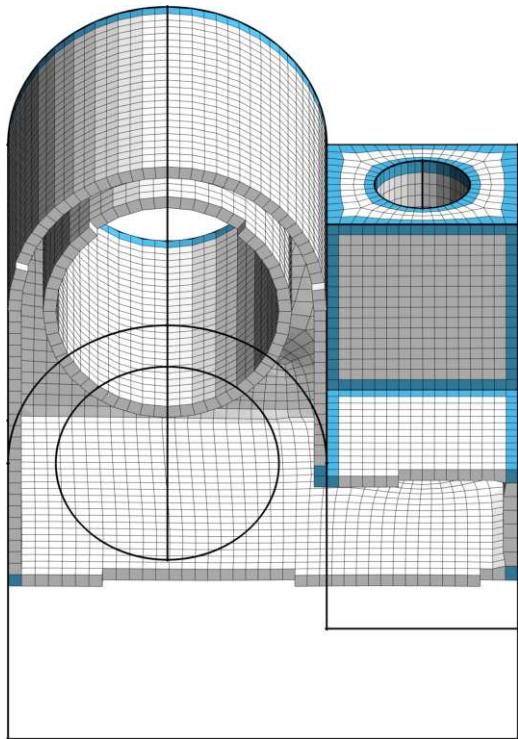
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
3696	3177	0.489	0.96	0.99	0

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 3.58579s	25412	12708	369.393	-	-	0.402	0.92	0.99
Ours	0.003379s / 0.723796s	24264	12132	0	0	0	0.449	0.96	0.99

Figures:



Model: S40

CAD: 77 corners, 117 curves, 43 surfaces, 1 volume

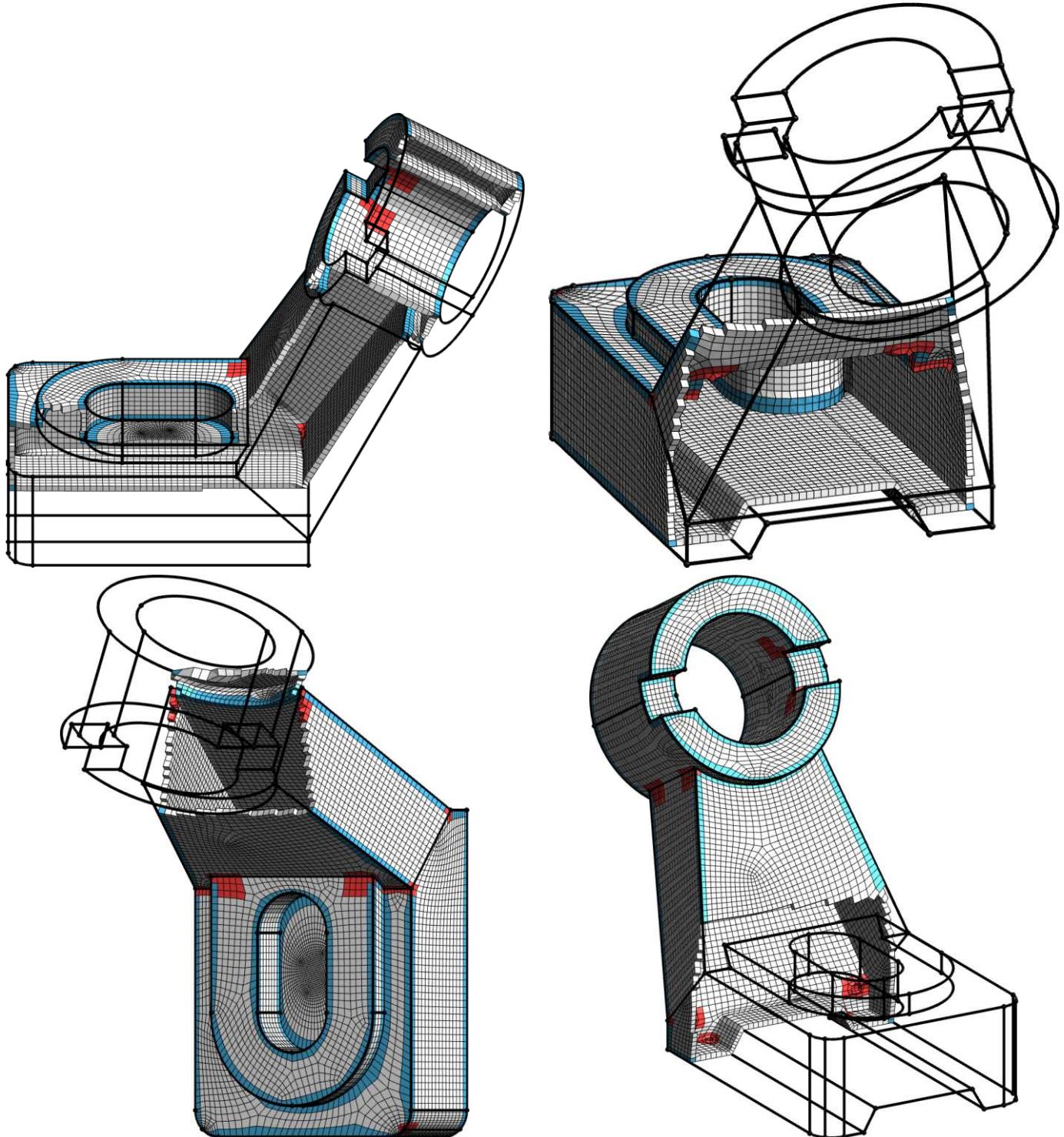
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2112	1456	0.094	0.59	0.67	19

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 6.67127s	32344	16172	647.604	-	-	0.160	0.86	0.94
Ours	6.9748s / 2.32703s	31198	15602	86.4697	15	105	0.120	0.90	0.97

Figures:



Model: S41

CAD: 65 corners, 99 curves, 36 surfaces, 1 volume

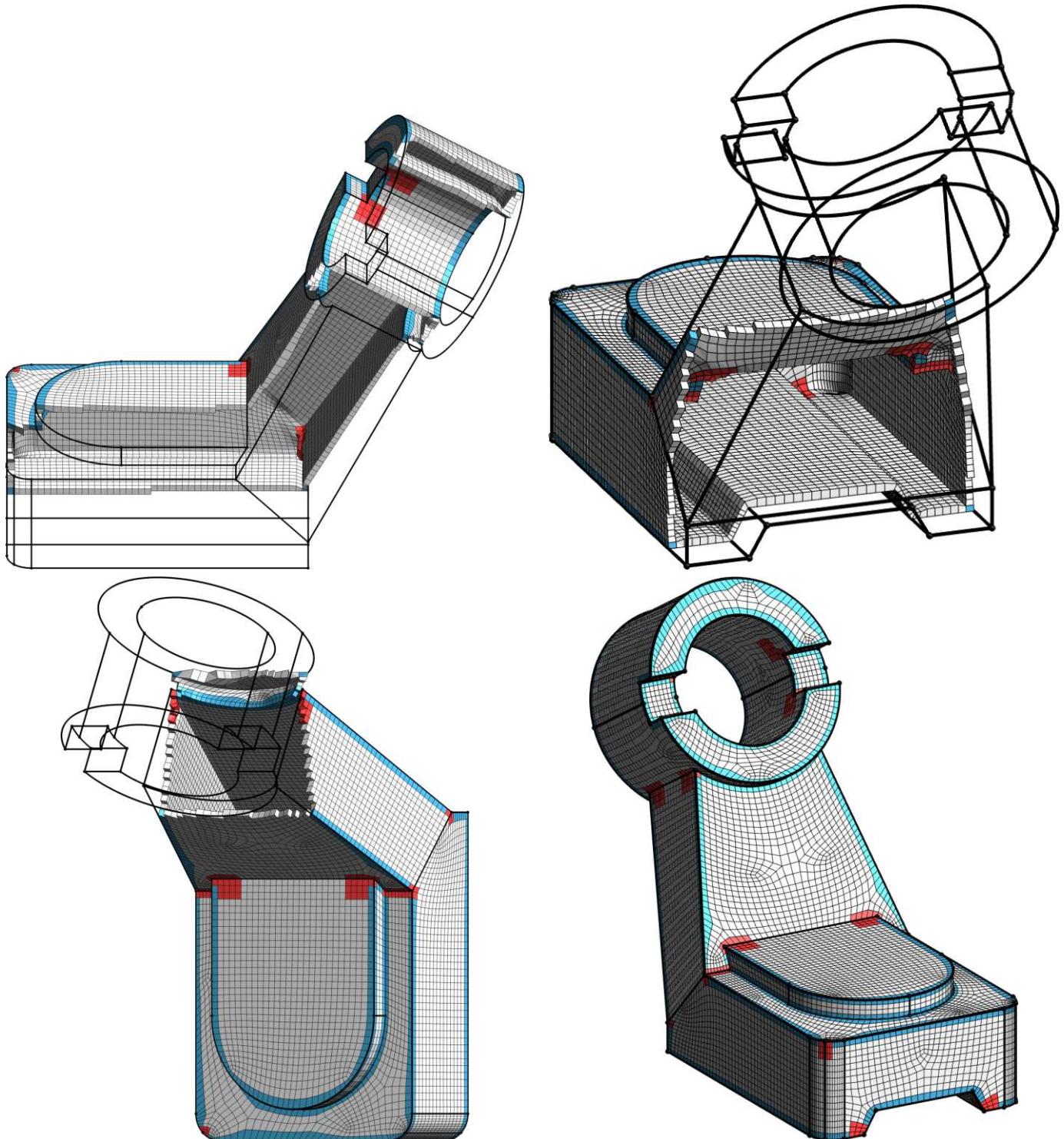
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
4426	3560	0.193	0.91	0.98	18

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 8.20214s	28480	14240	567.747	-	-	0.156	0.86	0.94
Ours	7.14037s / 1.90718s	27318	13662	78.4666	14	98	0.136	0.90	0.97

Figures:



Model: S42

CAD: 55 corners, 84 curves, 31 surfaces, 1 volume

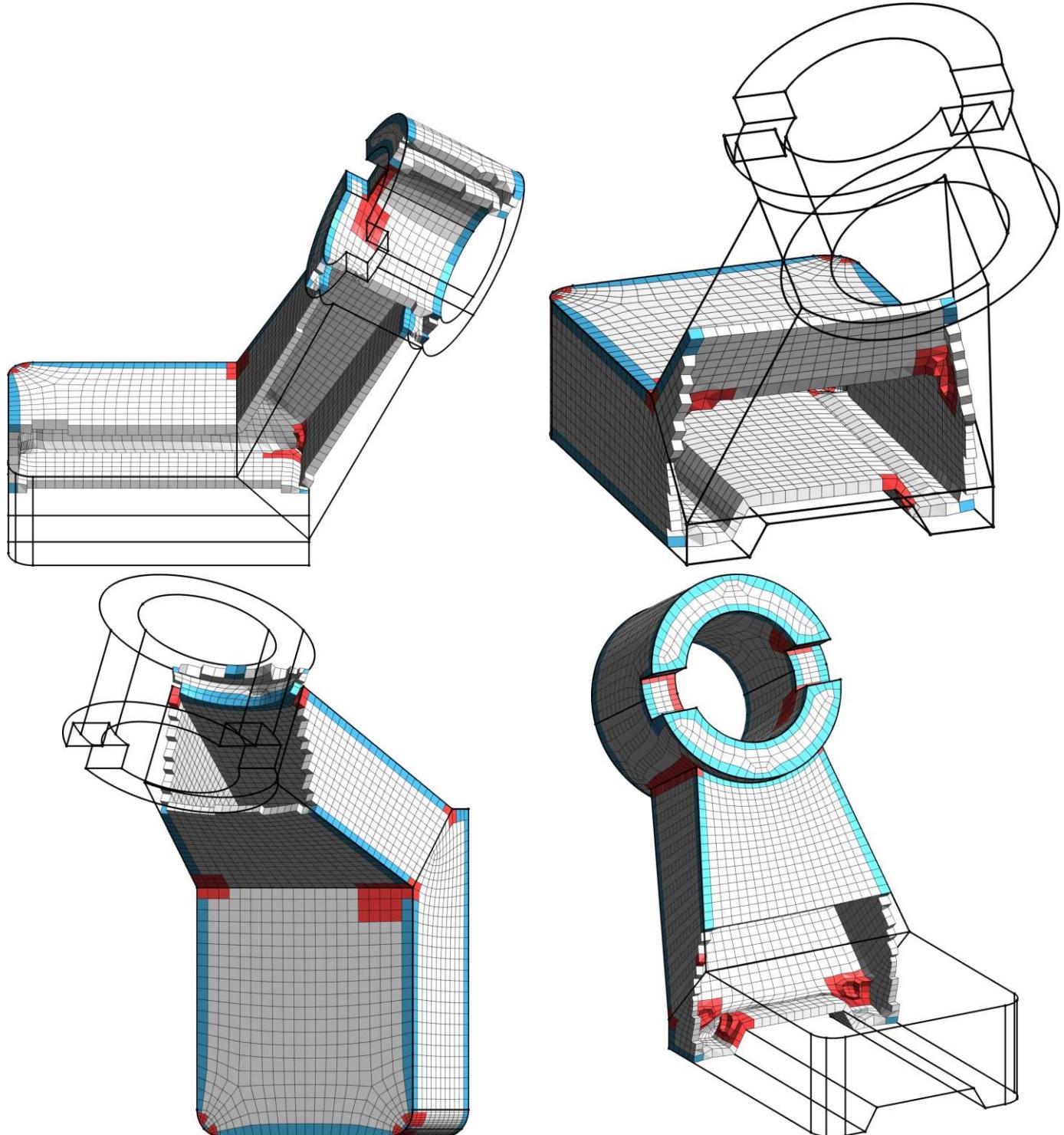
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2146	1609	0.144	0.89	0.96	22

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 8.27857s	12872	6436	336.461	-	-	0.136	0.81	0.87
Ours	12.1357s / 1.69537s	12180	6098	103.018	7	114	0.101	0.86	0.95

Figures:



Model: S43

CAD: 47 corners, 72 curves, 27 surfaces, 1 volume

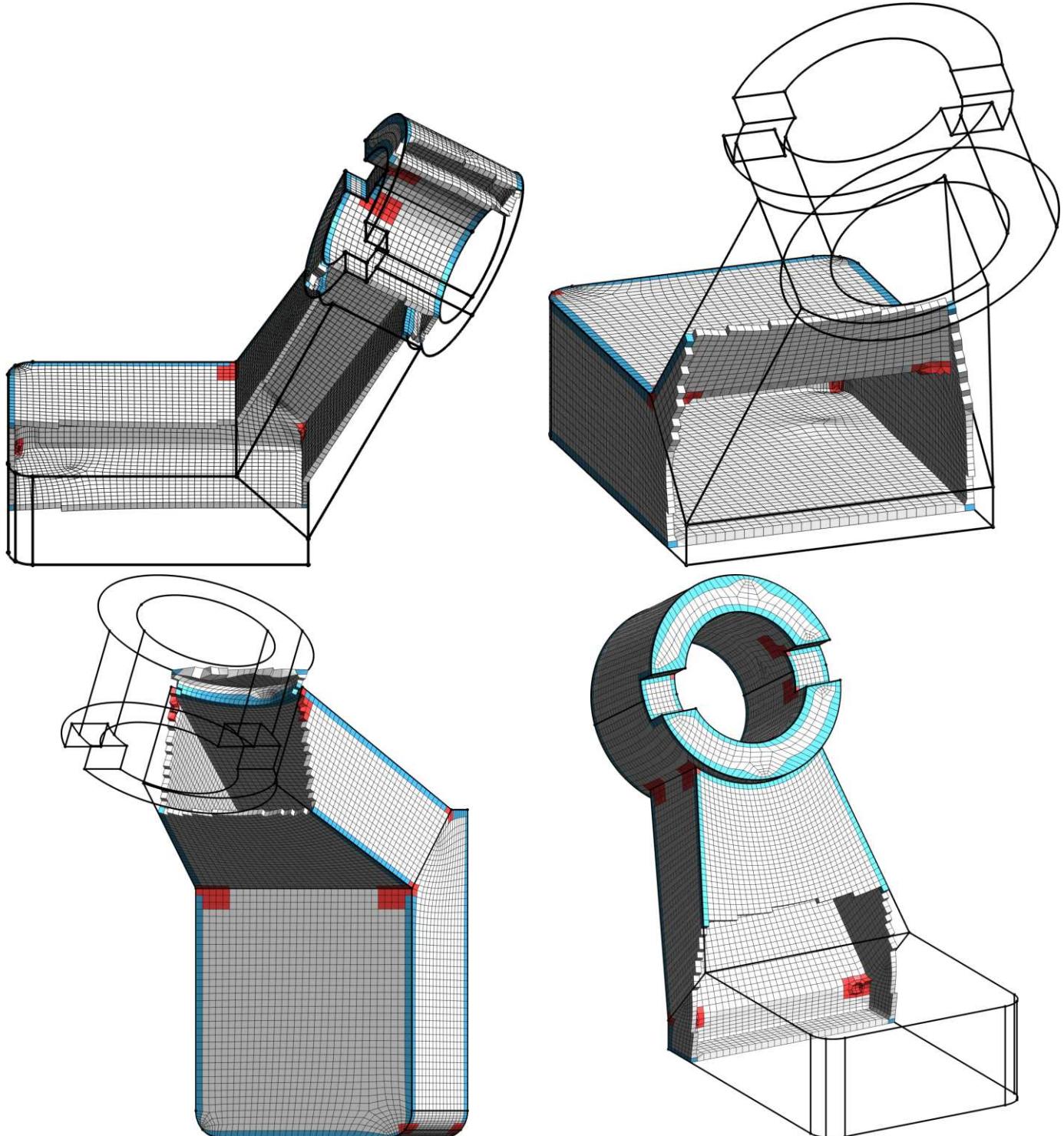
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
3975	3324	0.193	0.93	0.98	15

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 5.43678s	26592	13296	469.518	-	-	0.157	0.88	0.97
Ours	6.03995s / 1.48472s	25428	12716	70.4671	13	81	0.141	0.93	0.98

Figures:



Model: S44

CAD: 39 corners, 60 curves, 23 surfaces, 1 volume

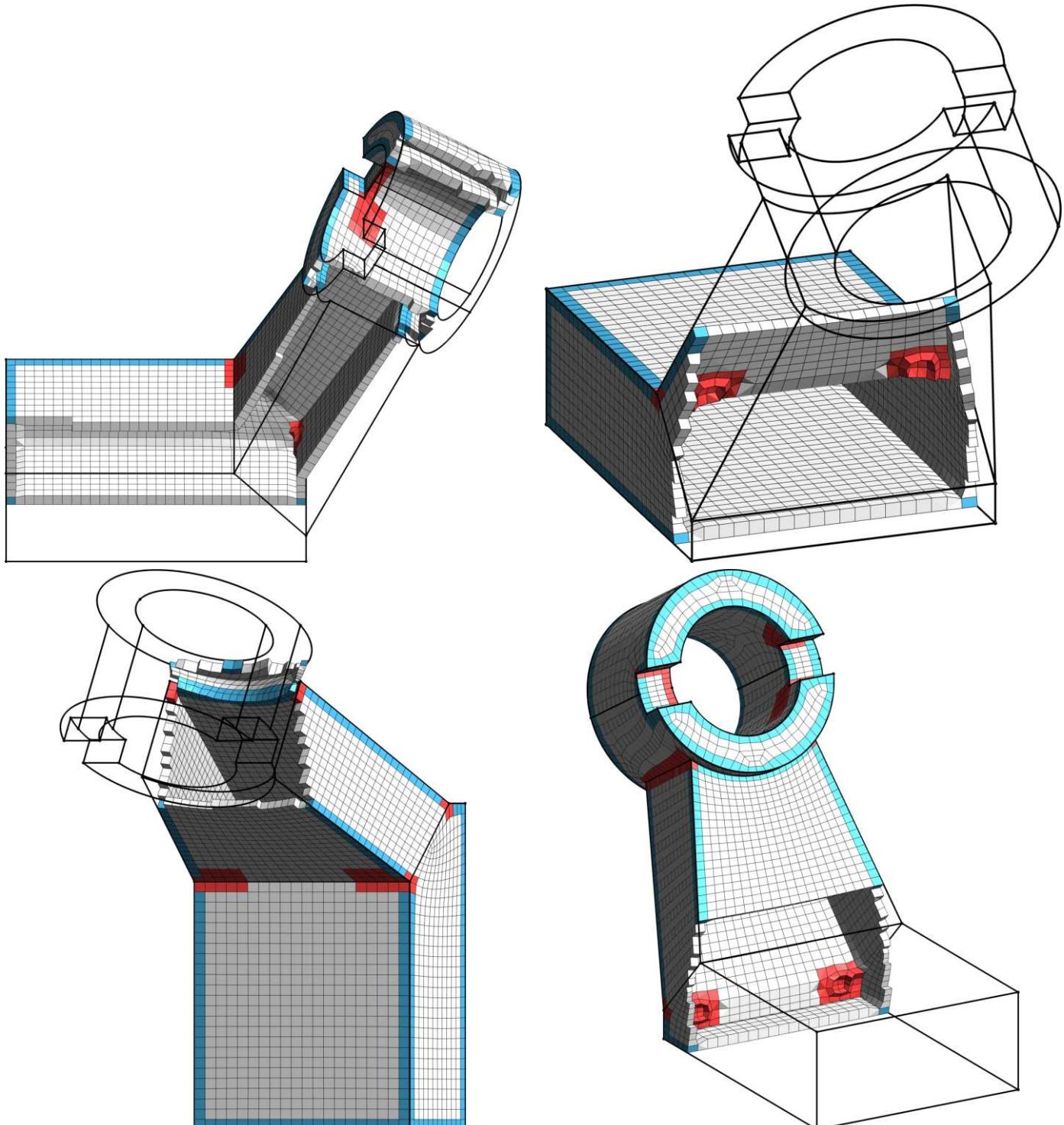
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
1849	1444	0.265	0.93	0.97	13

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 2.77019s	11552	5776	312.198	-	-	0.187	0.85	0.94
Ours	6.3569s / 0.588247s	10748	5372	35.0642	4	55	0.266	0.93	0.97

Figures:



Model: S45

CAD: 31 corners, 45 curves, 16 surfaces, 1 volume

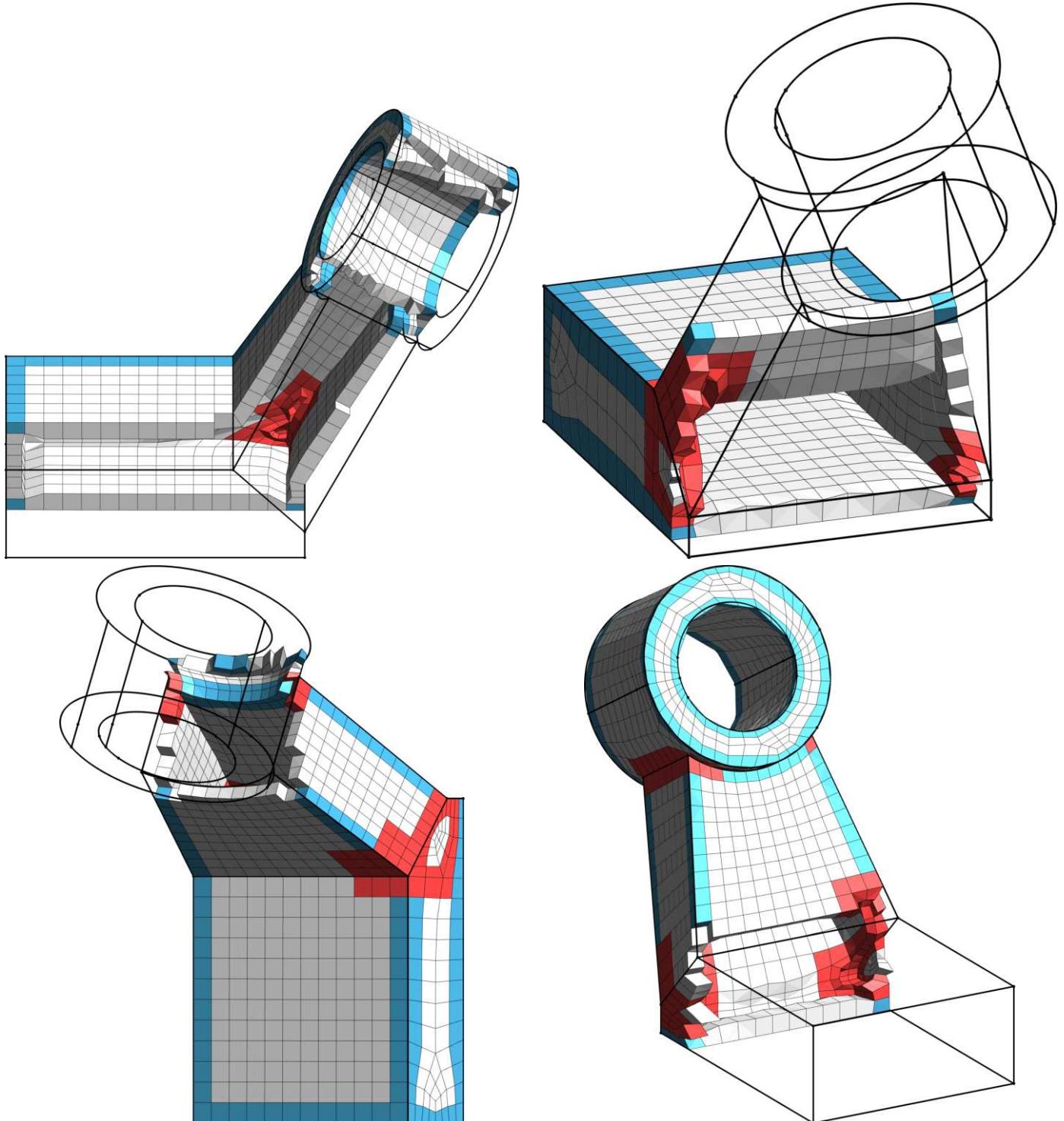
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
828	596	0.176	0.83	0.90	8

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 1.86611s	4768	2384	168.322	-	-	0.123	0.73	0.77
Ours	2.99554s / 0.492616s	4324	2164	29.5131	1	35	0.175	0.83	0.89

Figures:



Model: S4

CAD: 31 corners, 46 curves, 17 surfaces, 1 volume

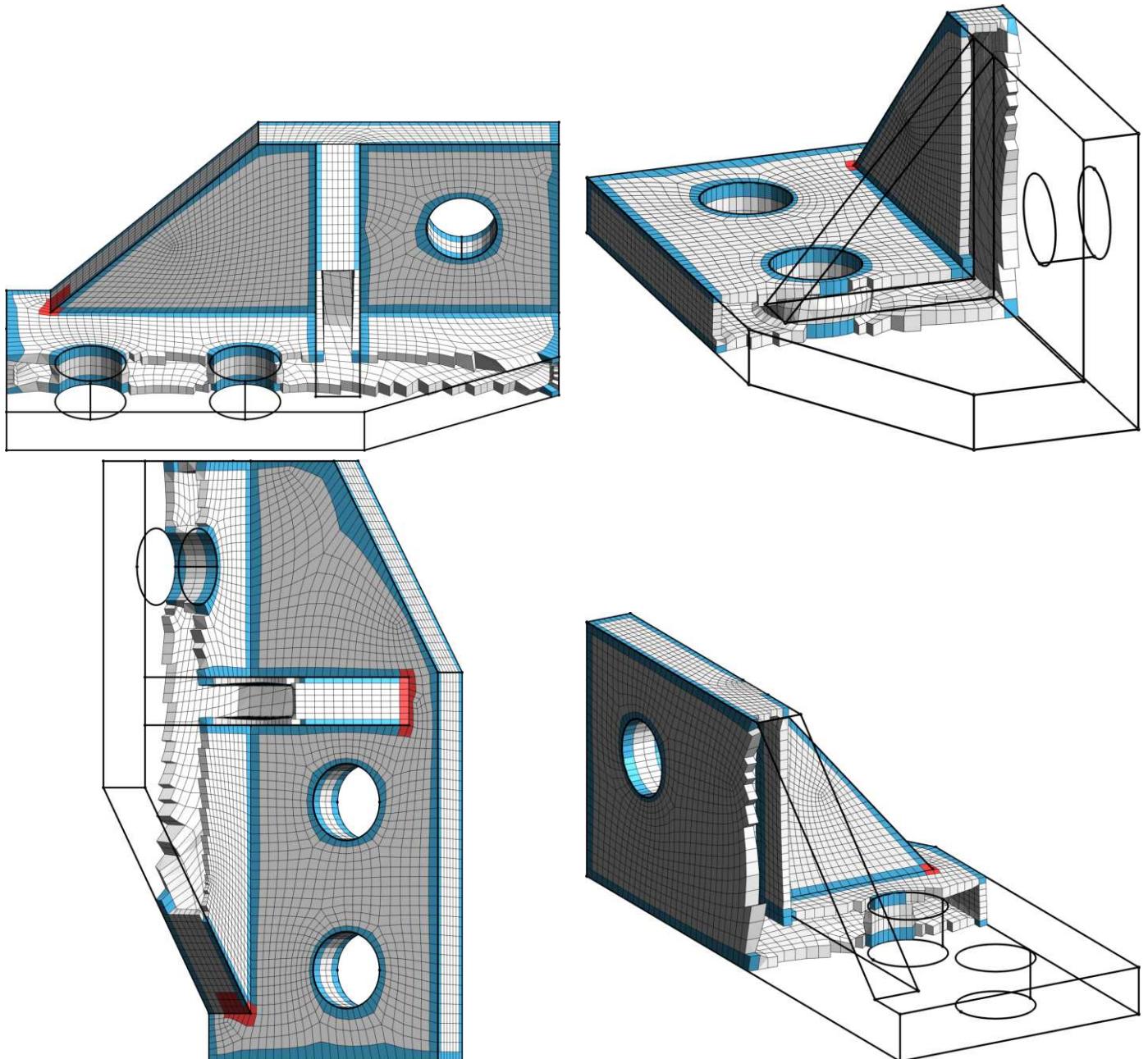
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
2471	1973	0.505	0.88	0.89	3

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 3.81972s	15776	7892	466.098	-	-	0.293	0.82	0.85
Ours	0.164629s / 0.722907s	14536	7270	4.36549	2	10	0.382	0.88	0.91

Figures:



Model: S5

CAD: 88 corners, 132 curves, 45 surfaces, 1 volume

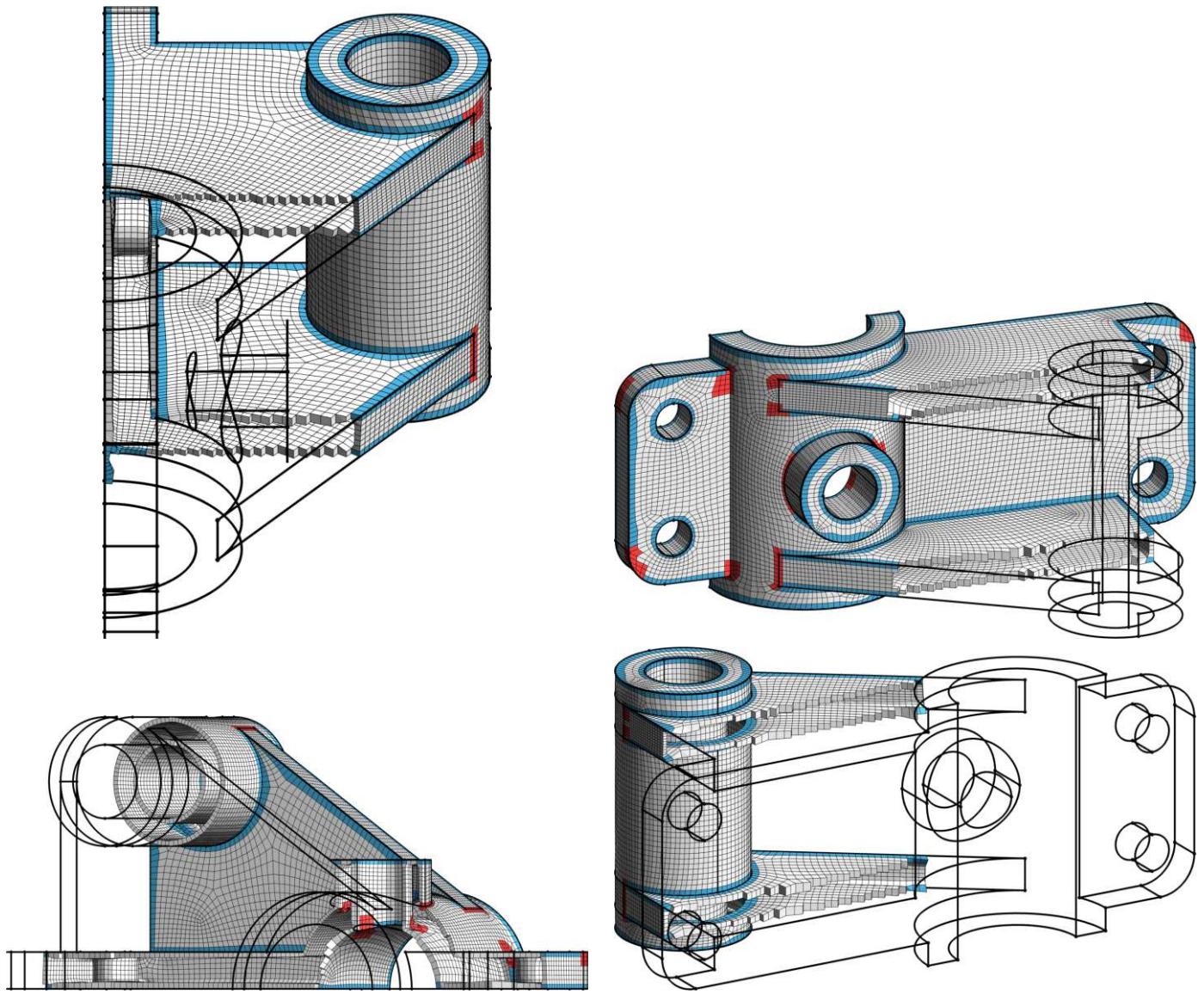
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
8700	7170	0.032	0.91	0.95	27

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 23.3522s	57336	28680	1185.88	-	-	-0.14	0.86	0.94
Ours	16.1649s / 4.5679s	55368	27702	109.198	13	121	0.025	0.91	0.95

Figures:



Model: S6

CAD: 99 corners, 146 curves, 51 surfaces, 1 volume

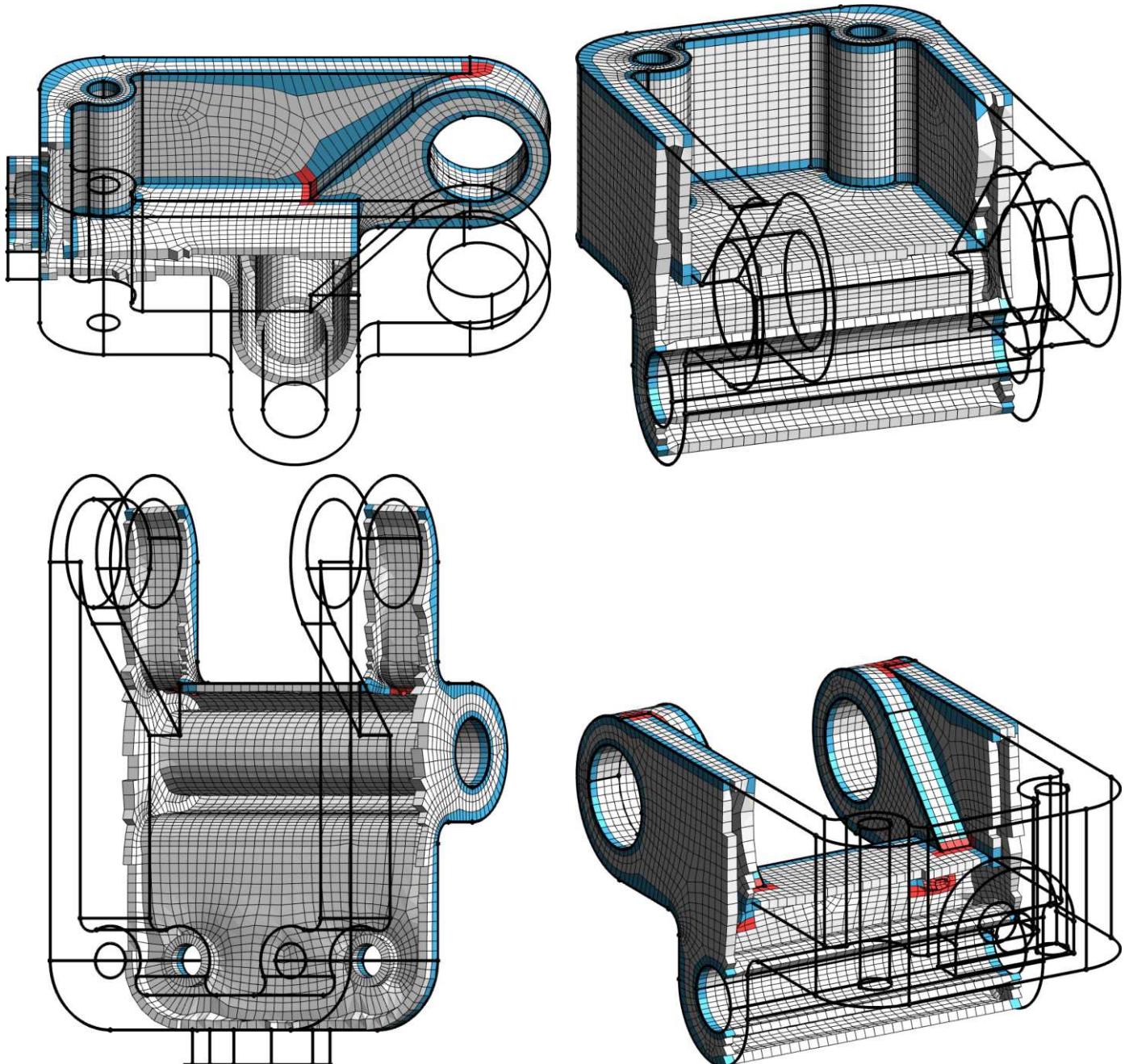
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
4838	3729	0.082	0.81	0.87	6

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 7.58043s	29816	14916	761.318	-	-	0.049	0.77	0.83
Ours	0.065298s / 2.4123s	28058	14038	21.0063	6	26	0.062	0.82	0.87

Figures:



Model: S7

CAD: 15 corners, 23 curves, 10 surfaces, 1 volume

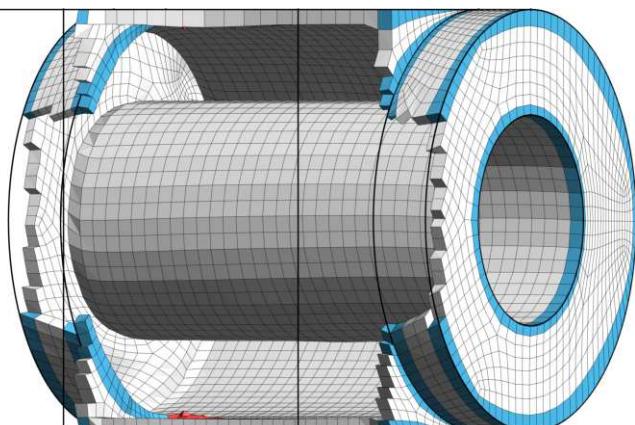
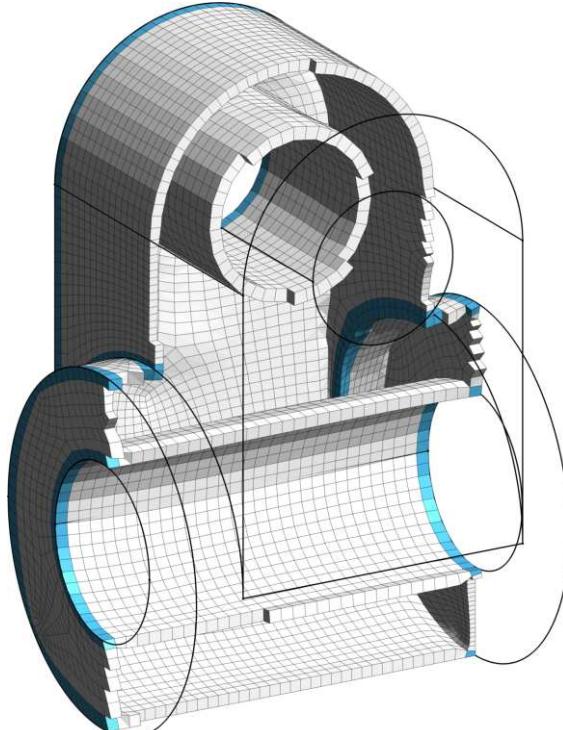
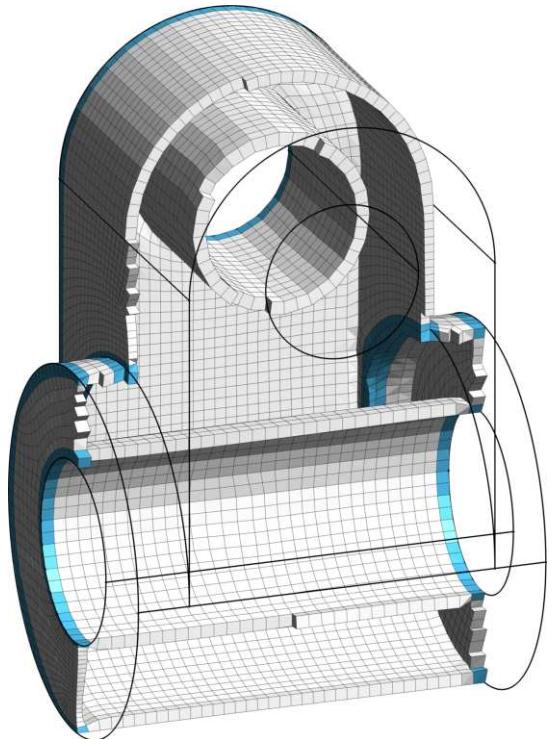
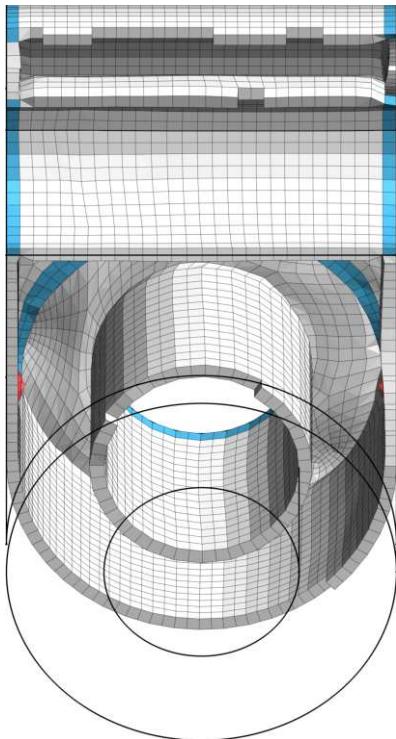
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
3096	2702	0.048	0.91	0.99	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 5.75821s	21612	10808	330.538	-	-	0.028	0.87	0.97
Ours	0.12208s / 1.34858s	20780	10392	20.6446	4	20	0.037	0.92	0.98

Figures:



Model: S8

CAD: 63 corners, 94 curves, 34 surfaces, 1 volume

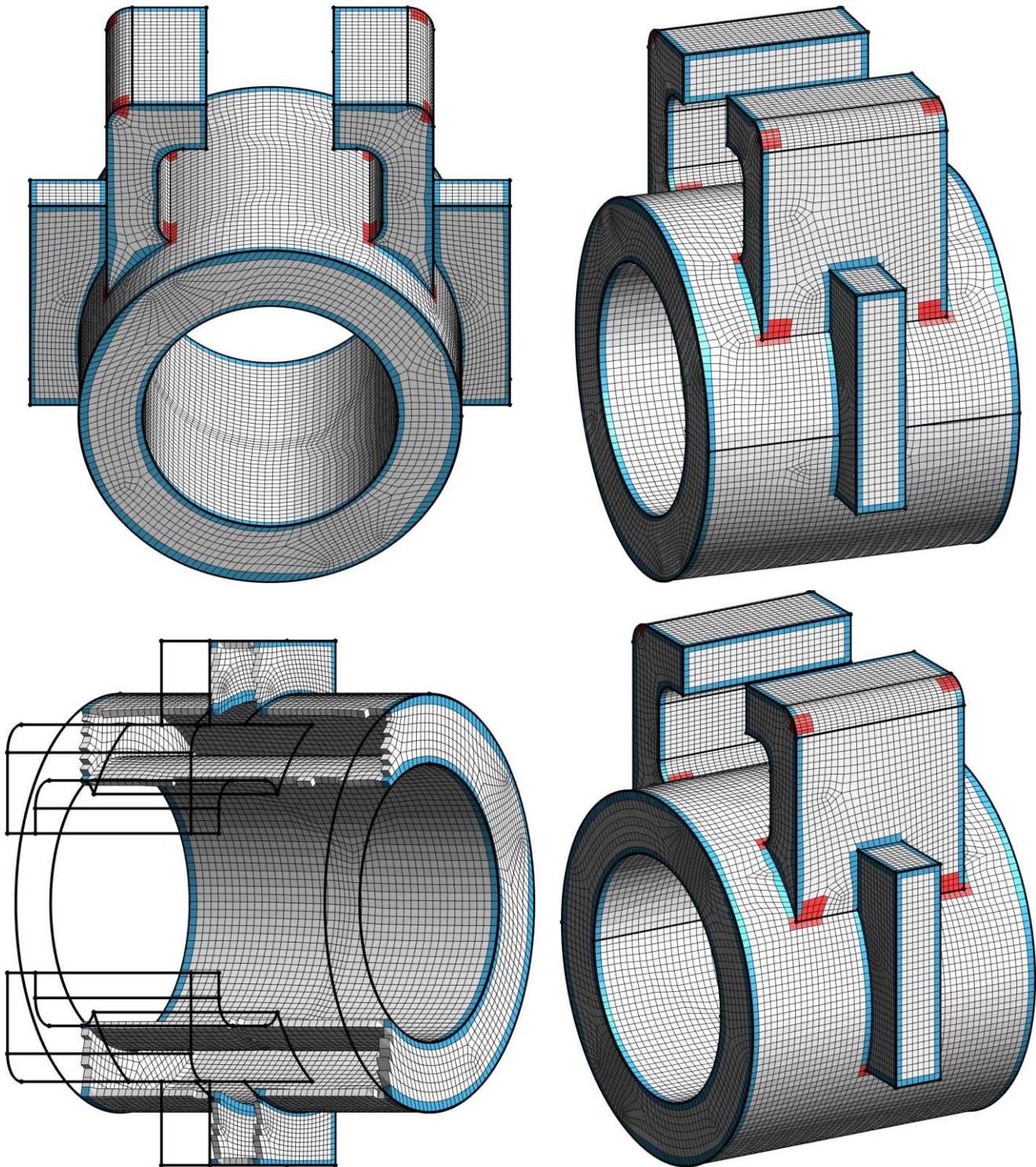
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
6826	5832	0.257	0.93	0.99	16

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 5.9251s	46656	23328	767.227	-	-	0.221	0.89	0.96
Ours	0.173513s / 1.78137s	44840	22420	62.1839	14	76	0.183	0.94	0.98

Figures:



Model: S9

CAD: 35 corners, 51 curves, 20 surfaces, 1 volume

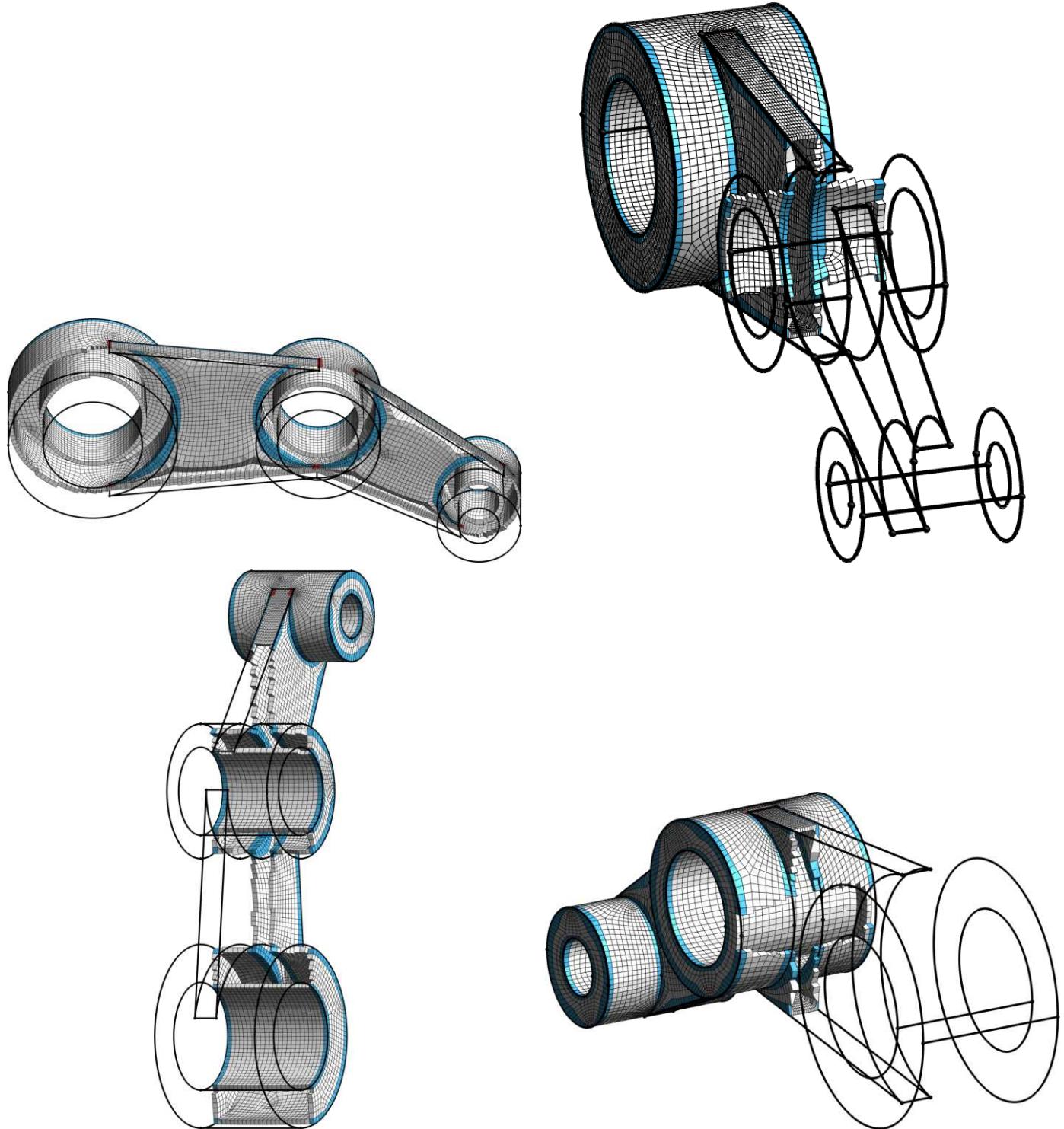
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
6998	5923	0.020	0.87	0.94	16

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 15.8365s	47376	23692	1017.44	-	-	-0.16	0.83	0.92
Ours	7.52439s / 3.22619s	45760	22888	60.9392	12	68	-0.19	0.87	0.94

Figures:



Model: M1

CAD: 76 corners, 114 curves, 42 surfaces, 1 volume

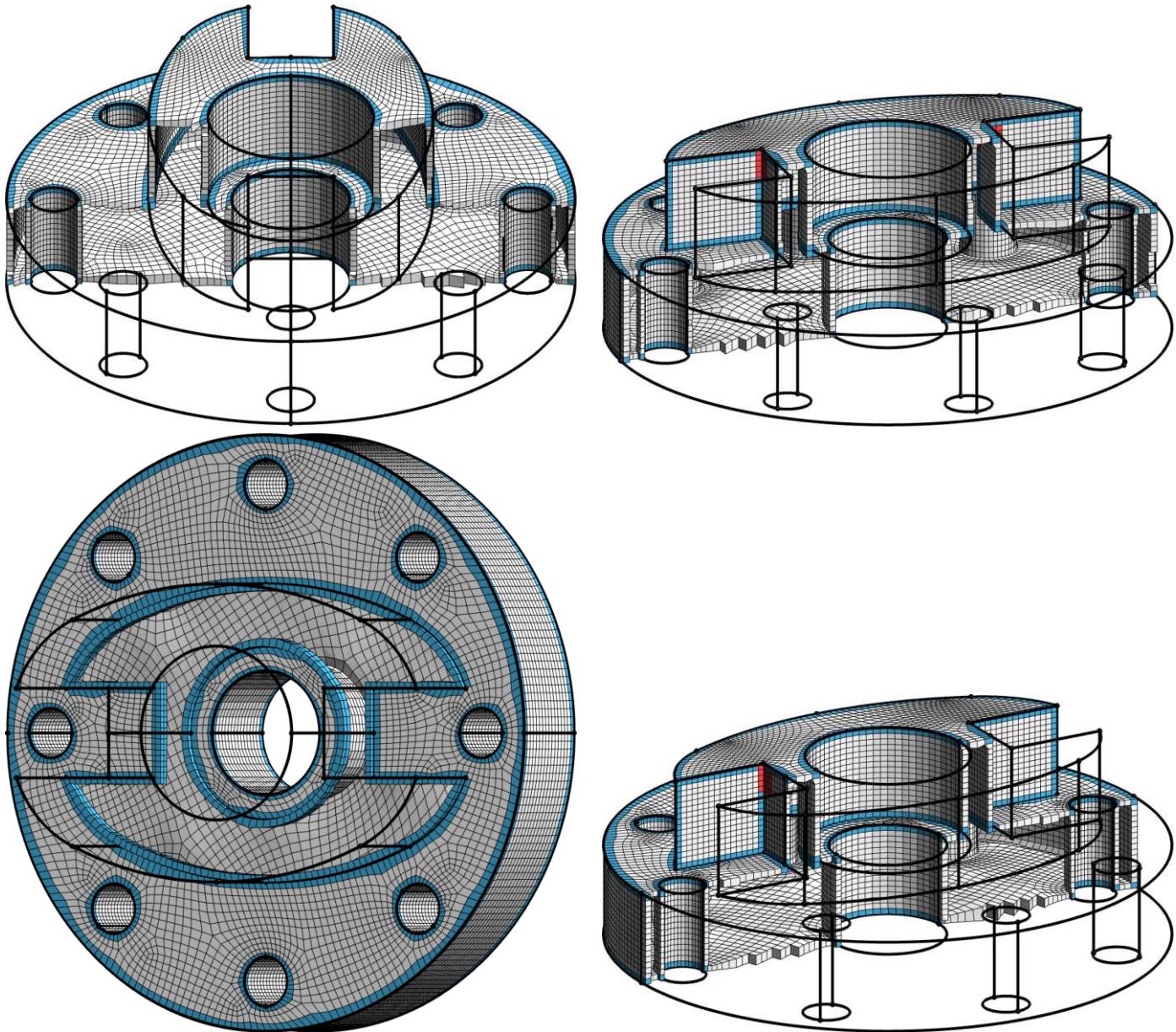
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
7086	5848	0.501	0.92	0.96	4

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 7.01675s	46752	23392	996.564	-	-	0.340	0.87	0.92
Ours	0.019262s / 1.58483s	44414	22218	16	4	20	0.533	0.93	0.94

Figures:



Model: M2

CAD: 46 corners, 71 curves, 28 surfaces, 1 volume

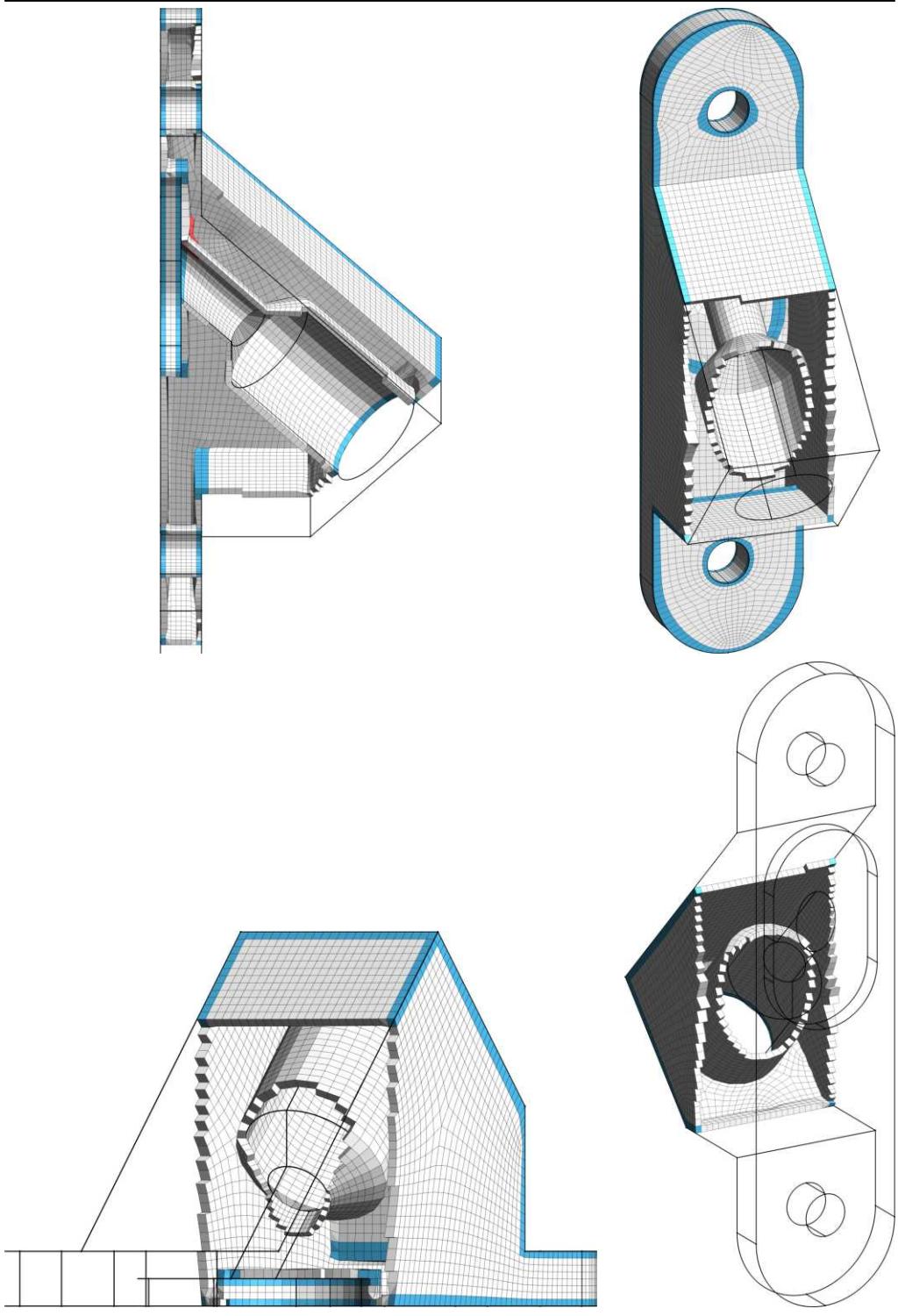
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
3569	2884	0.155	0.92	0.95	3

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 4.59719s	23064	11536	501.772	-	-	0.104	0.86	0.93
Ours	1.77588s / 0.862221s	21612	10812	19.07	2	19	0.177	0.92	0.95

Figures:



Model: M3

CAD: 111 corners, 169 curves, 60 surfaces, 1 volume

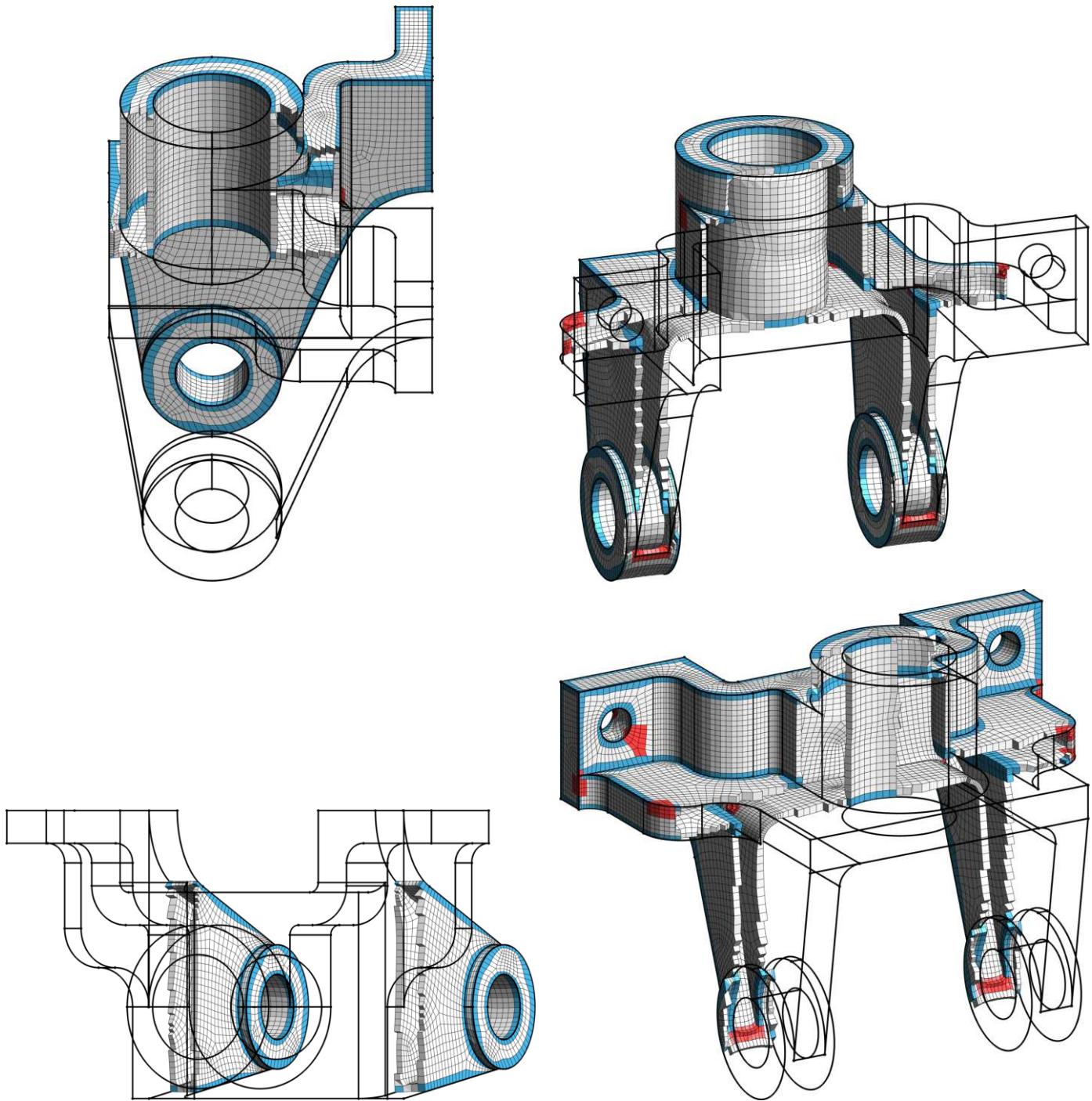
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
6973	5463	0.060	0.83	0.93	29

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 28.4045s	43688	21852	1160.88	-	-	0.036	0.78	0.83
Ours	7.14181s / 4.50975s	41326	20678	137.316	20	137	0.048	0.84	0.92

Figures:



Model: M4

CAD: 67 corners, 108 curves, 38 surfaces, 1 volume

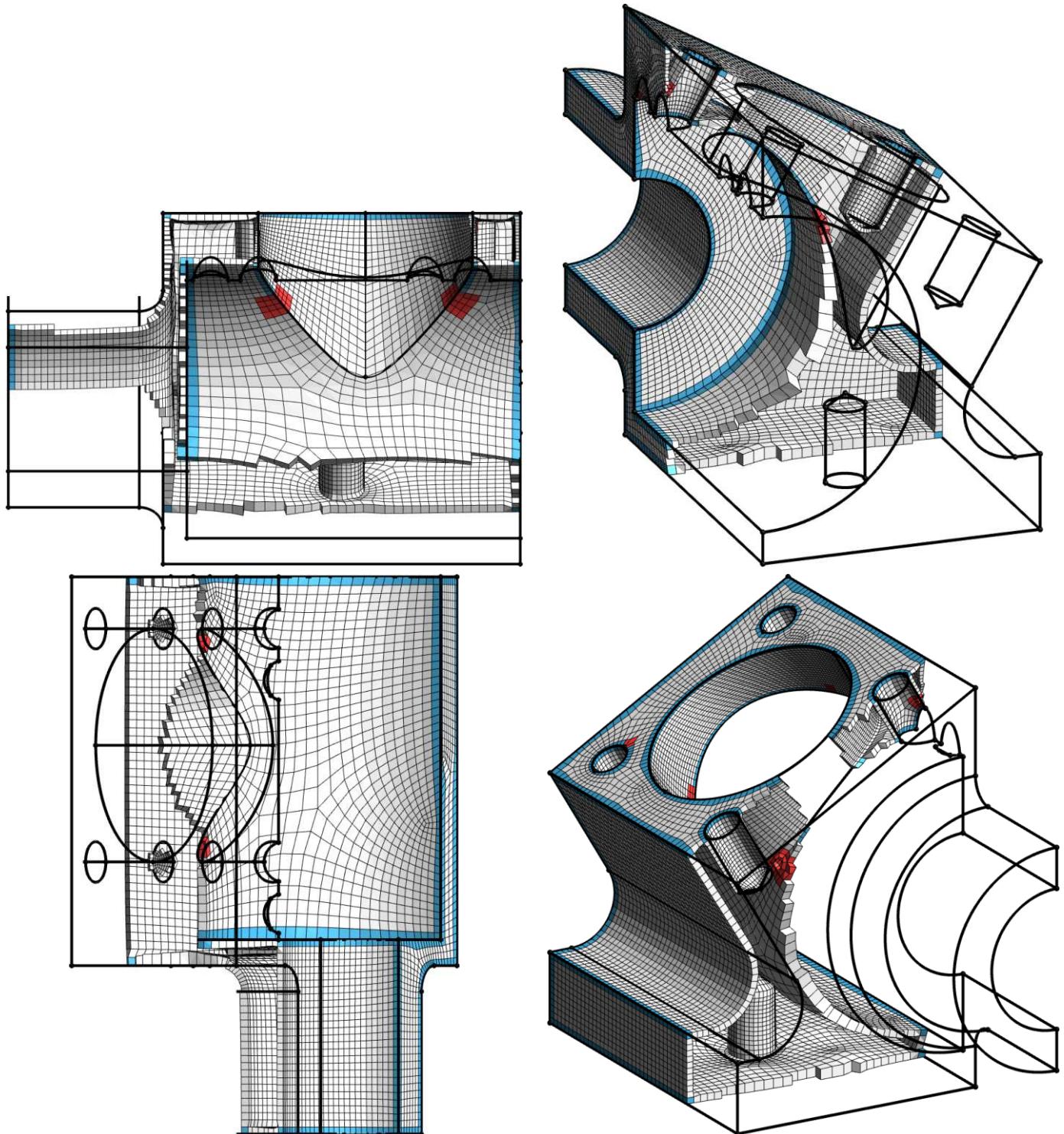
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
6439	5282	0.312	0.90	0.95	20

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 9.56319s	42248	21128	843.068	-	-	0.112	0.84	0.91
Ours	7.45747s / 1.97802s	39712	19852	74.7526	9	86	0.227	0.90	0.95

Figures:



Model: M5

CAD: 70 corners, 108 curves, 41 surfaces, 1 volume

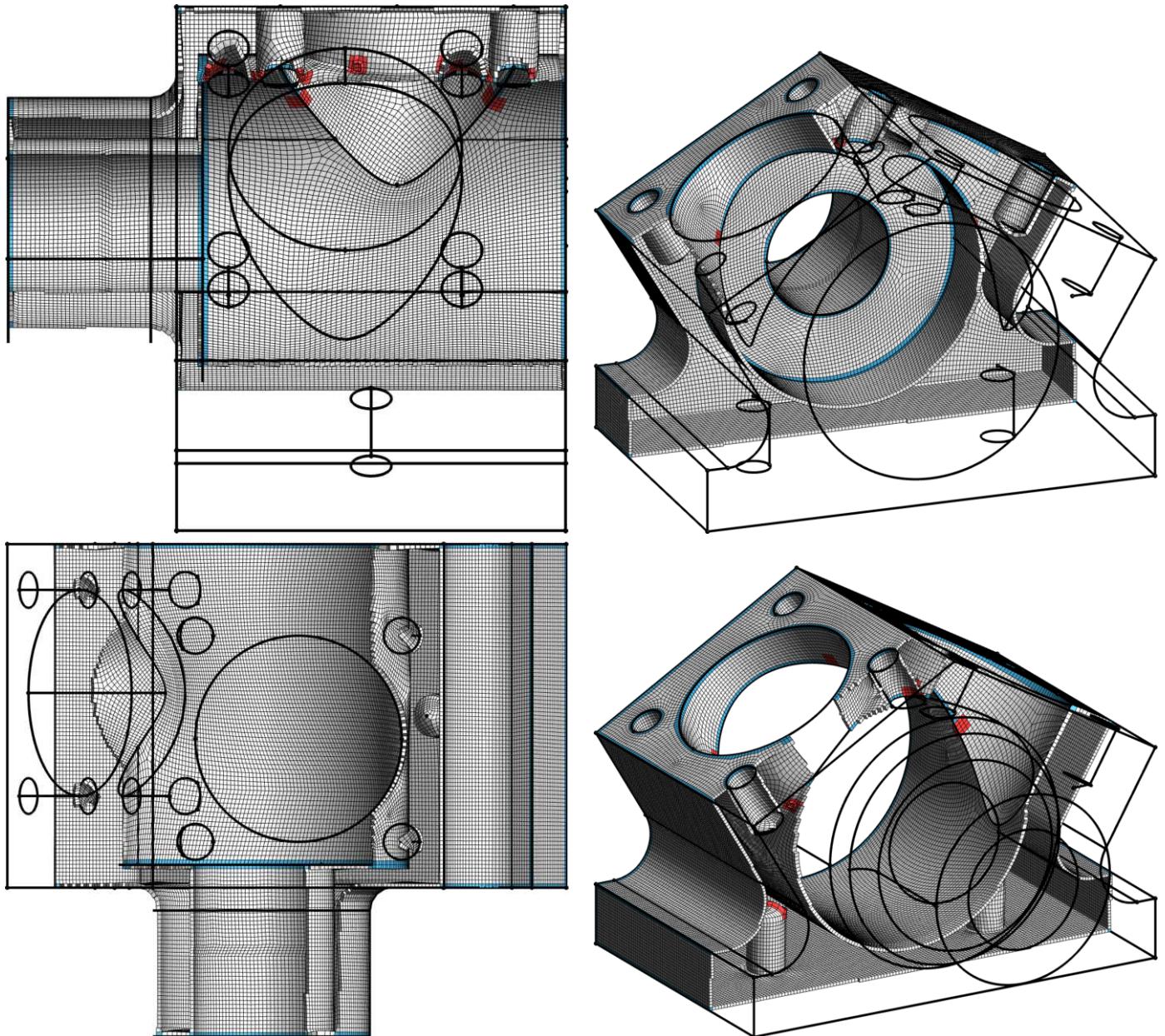
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
24704	22361	0.275	0.95	0.98	20

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 24.0781s	178864	89444	1709.94	-	-	0.066	0.92	0.98
Ours	9.04668s / 6.12313s	173490	86758	87.9794	9	116	0.067	0.96	0.99

Figures:



Model: M6

CAD: 68 corners, 105 curves, 39 surfaces, 1 volume

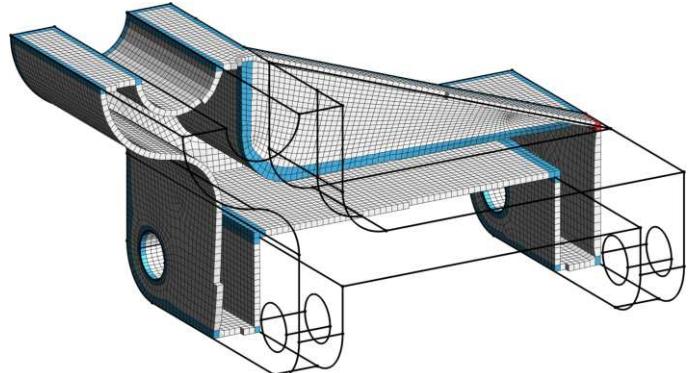
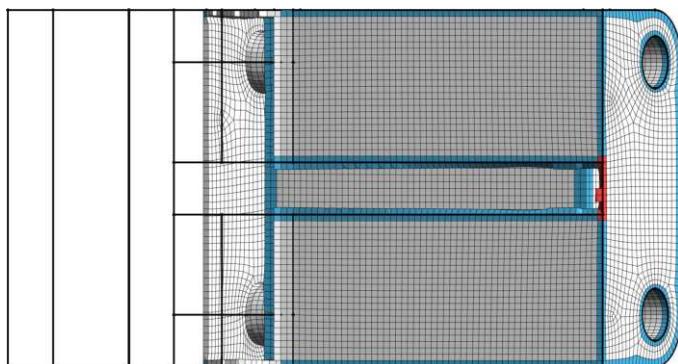
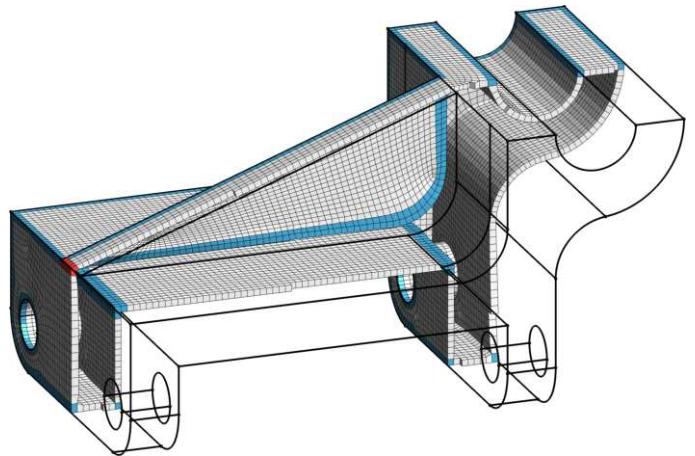
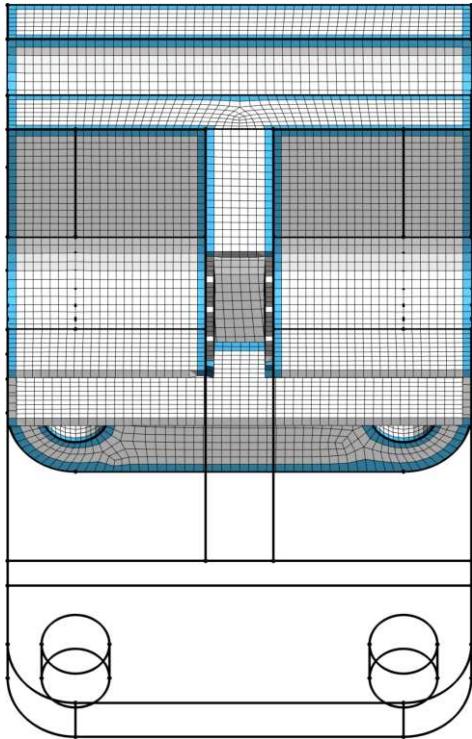
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
6279	5198	0.296	0.94	0.99	2

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 10.619s	41572	20792	845.021	-	-	0.204	0.89	0.97
Ours	0.296342s / 1.78334s	39234	19622	2.4277	1	5	0.269	0.95	0.98

Figures:



Model: M7

CAD: 183 corners, 289 curves, 112 surfaces, 1 volume

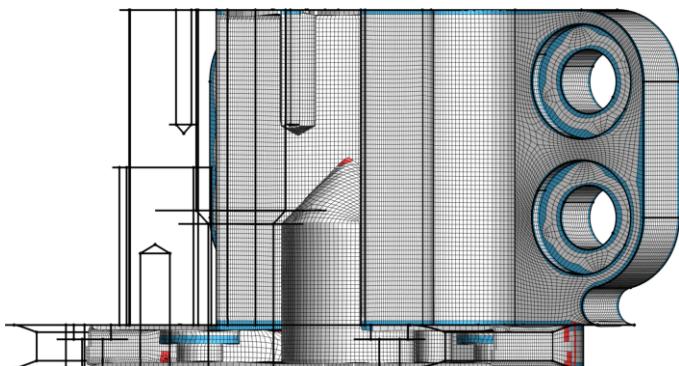
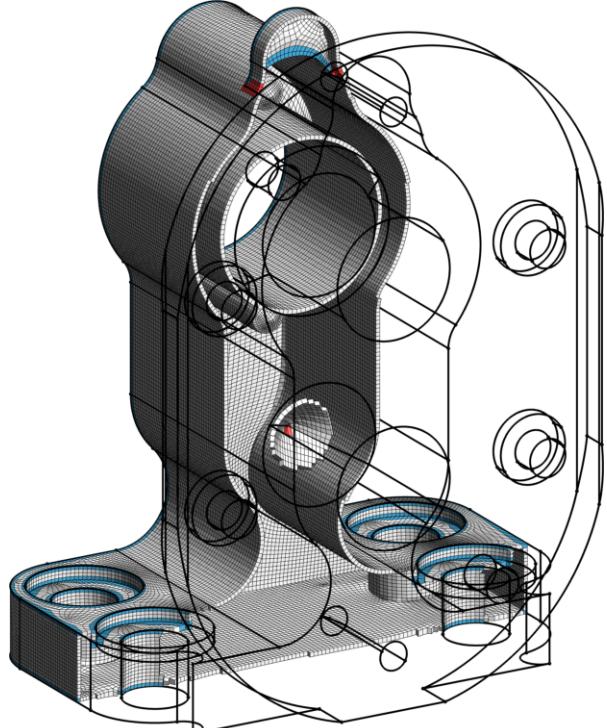
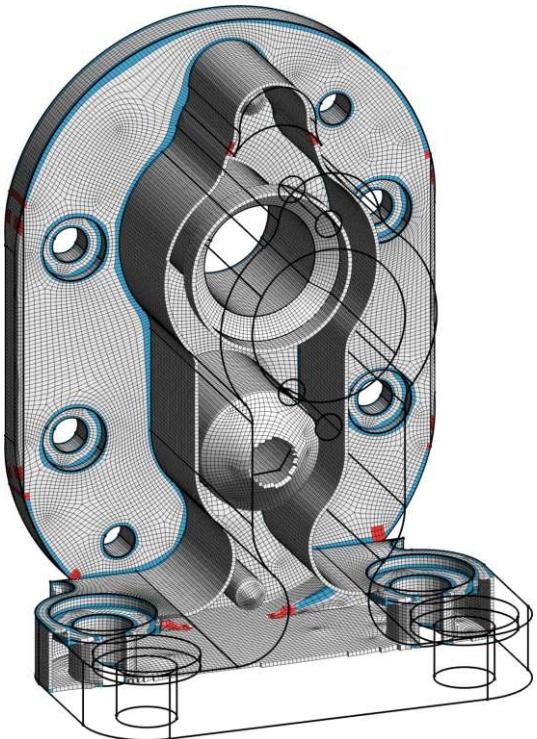
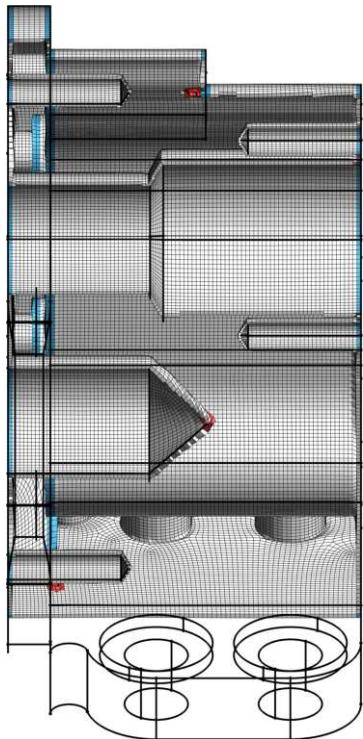
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
28665	24656	0.099	0.94	0.98	26

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 216.965s	197208	98624	2312.54	-	-	-0.14	0.90	0.98
Ours	18.0779s / 30.101s	192640	96344	103.563	11	105	-0.12	0.94	0.98

Figures:



Model: M8

CAD: 100 corners, 148 curves, 52 surfaces, 1 volume

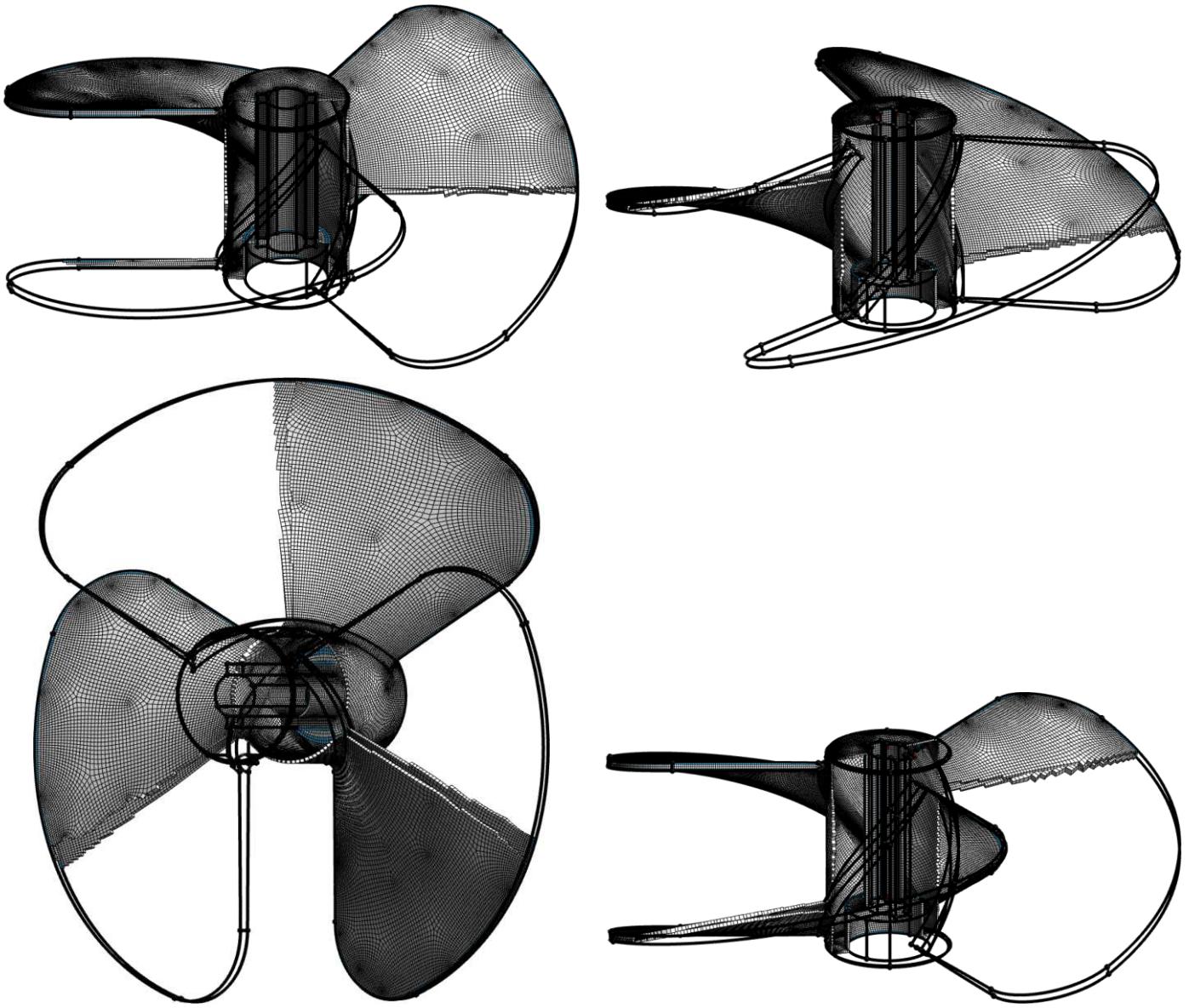
Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
31498	27848	0.056	0.91	0.95	22

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 32.6937s	222784	111392	2004.63	-	-	0.054	0.90	0.96
Ours	2.83457s / 12.0971s	217296	108660	125.941	20	126	0.051	0.92	0.96

Figures:



Model: M9

CAD: 76 corners, 118 curves, 40 surfaces, 1 volume

Input (boundary mesh, non grid-like corners):

#vert	#quads	qMin	qAvg	qMed	# ngl corners
13249	11725	0.148	0.92	0.96	13

All-hex boundary layers:

	time (topo/geom)	#vert	#hexa	energy	#probs	#irreg configs	qMin	qAvg	qMed
Extrusion	- / 9.96822s	93784	46900	524.243	-	-	0.150	0.91	0.96
Ours	7.78074s / 4.15146s	91890	45956	68.8314	9	72	0.171	0.92	0.96

Figures:

