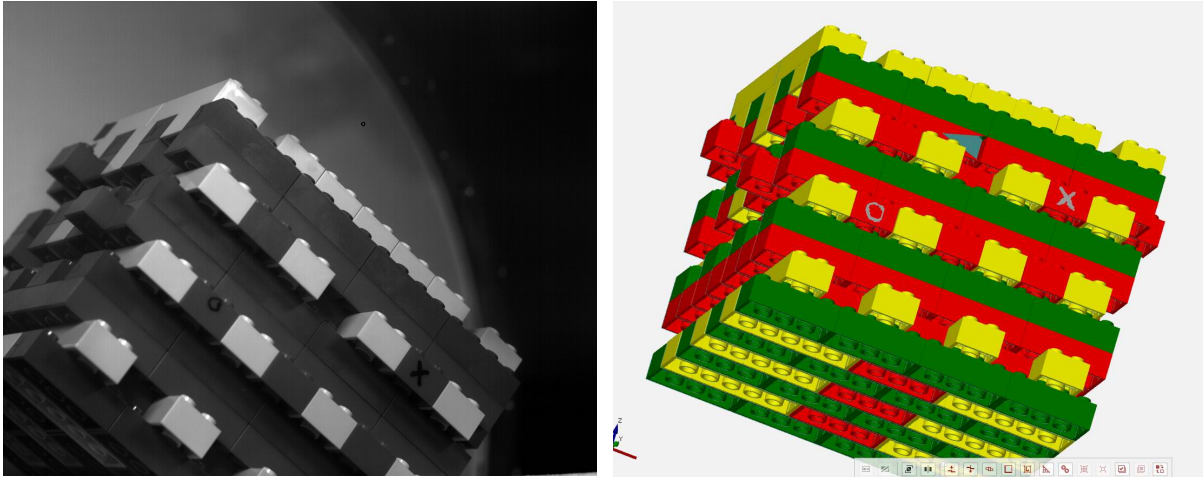Creating a calibration file from 3D surface coordinates using GOM Inspect

(using the ree version of the professional 3D Metrology software - download can be requested from https://www.gom.com/3d-software/gom-inspect.html)

View the recorded calibration image, and position the 3D-CAD file more or less in the same view in GOM Inspect software:


Create 'points' in GOM for landmarks that can serve as calibration points:
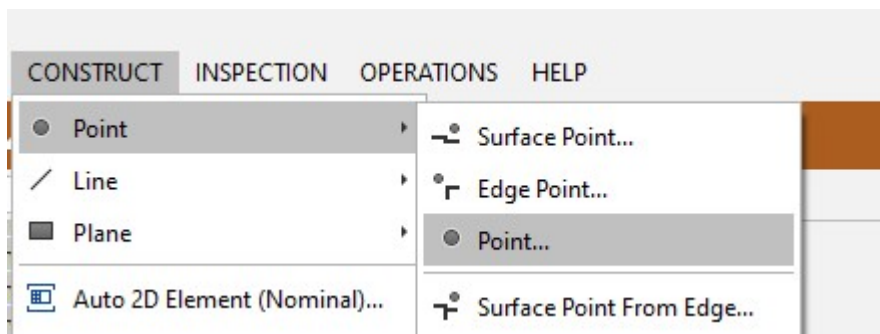
Hold CONTROL and click (LMB) the points on the mesh, and click 'CREATE' (or press ENTER) when ready. Do this for a reasonable amount spread across the image, and from different planes.

Show the point name labels for the created points by selecting all points in the object tree, and then RMB click to select CHOOSE VISUALIZATION -> NAME:
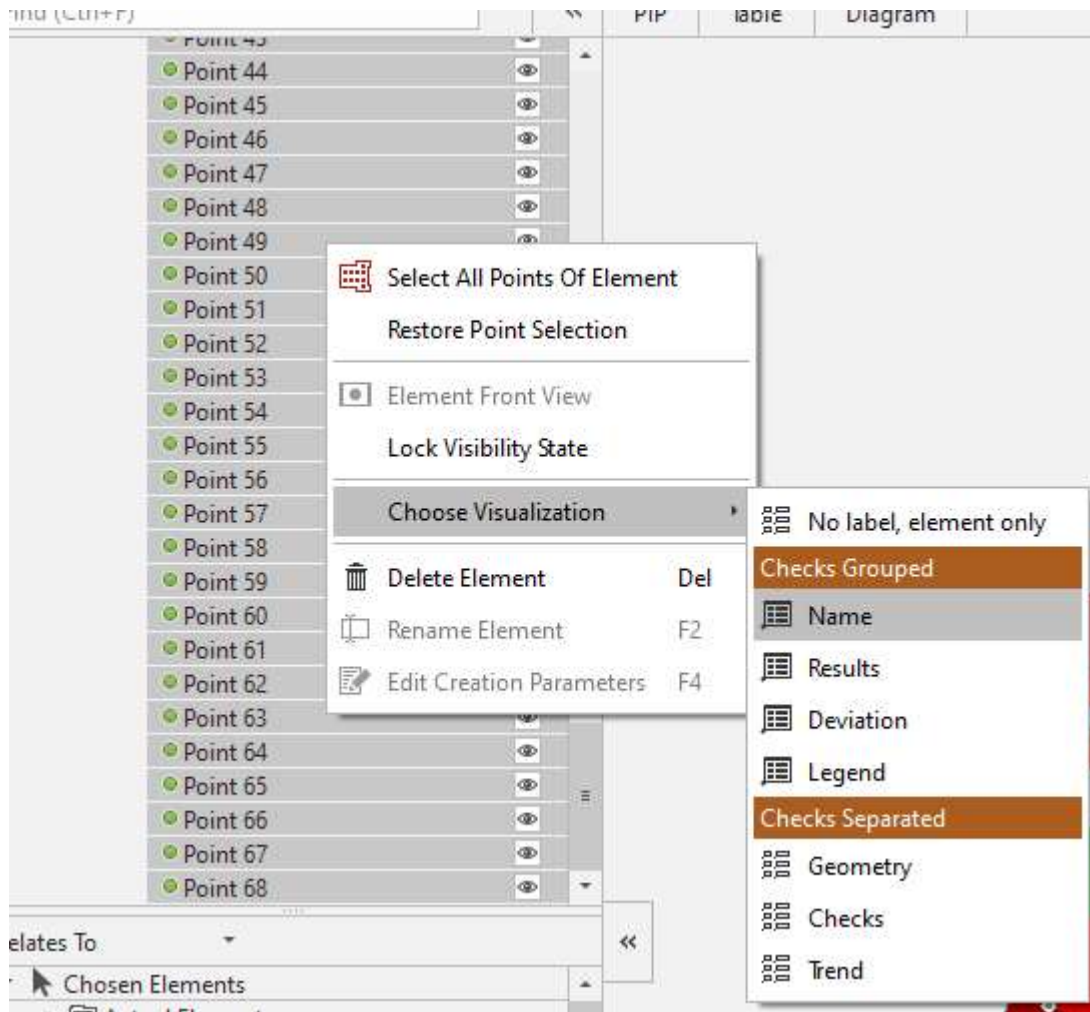
Now the labels are displayed, and this image can be used when having to digitize the corresponding landmarks in XMAlab:
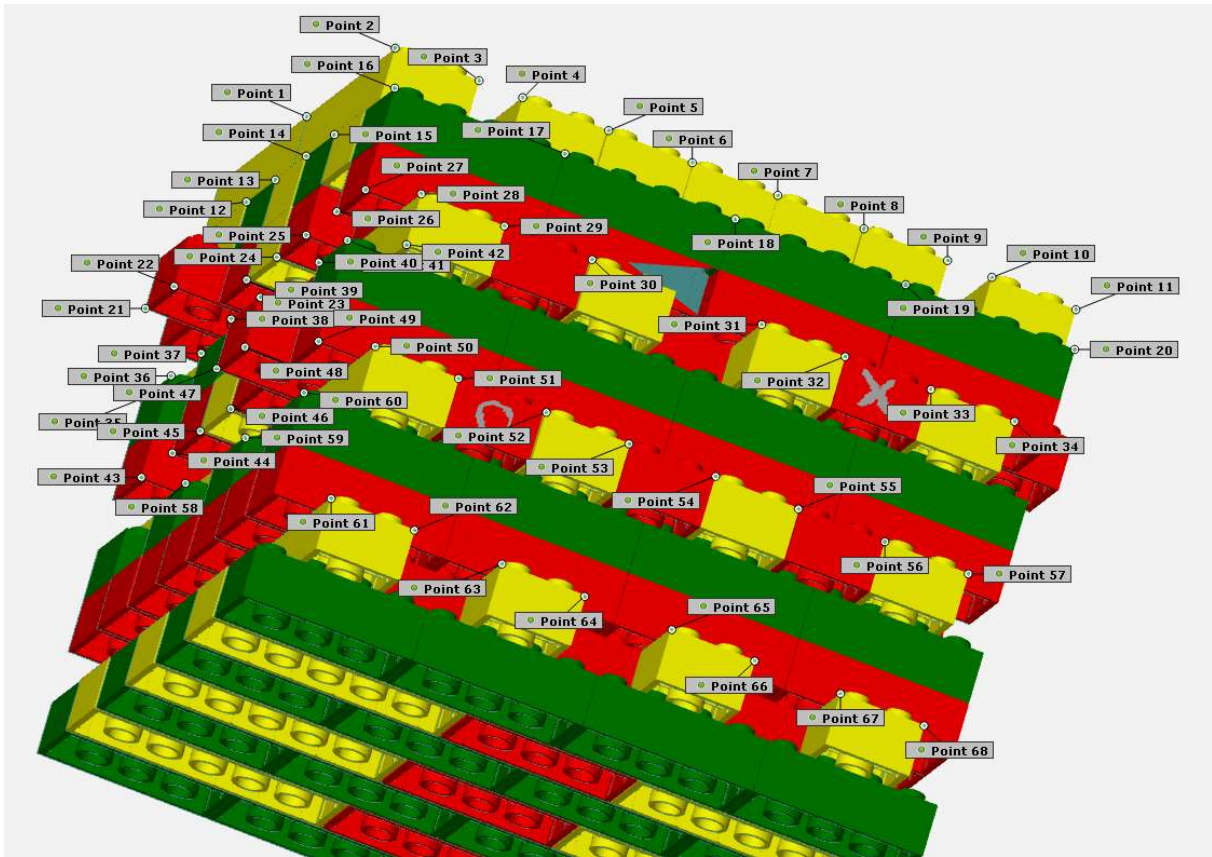
To export the 3D coordinates from these points:

File -> Export-> Elements -> Elements (XML).

This exports a .xml file from all the **selected** elements in object tree (number of points is indicated in the export panel).

Open this file using Excel:

	version	length_unit	angle_unit	id	name	state	x	y	z	result
2	2.3	mm	deg	16782238	Point 47	ok	115.799997	75.706993	40.213907	
3	2.3	mm	deg	16782167	Point 12	ok	107.439518	27.300003	87.922682	
4	2.3	mm	deg	16782169	Point 13	ok	107.285818	42.310526	88.100012	
5	2.3	mm	deg	16782145	Point 1	ok	107.299997	51.291418	97.643072	
6	2.3	mm	deg	16782157	Point 7	ok	35.418228	99.299927	97.634862	
7	2.3	mm	deg	16782161	Point 9	ok	3.5343	99.299988	97.64511	
8	2.3	mm	deg	16782165	Point 11	ok	-20.580236	99.299988	97.658452	
9	2.3	mm	deg	16782155	Point 6	ok	51.473409	99.299927	97.612752	
0	2.3	mm	deg	16782274	Point 65	ok	35.691916	116.100036	10.960347	
1	2.3	mm	deg	16782280	Point 68	ok	-11.639554	116.100021	11.088115	
2	2.3	mm	deg	16782171	Point 14	ok	107.277543	59.148526	88.099991	
3	2.3	mm	deg	16782153	Point 5	ok	67.186678	99.299927	97.622911	
4	2.3	mm	deg	16782258	Point 57	ok	-11.646072	115.700012	39.885493	
5	2.3	mm	deg	16782159	Point 8	ok	19.200006	99.262141	97.607981	
6	2.3	mm	deg	16782173	Point 15	ok	107.245795	74.319381	88.099991	
7	2.3	mm	deg	16782206	Point 31	ok	35.64533	115.700027	68.744652	
8	2.3	mm	deg	16782149	Point 3	ok	91.515561	99.299988	97.656413	
9	2.3	mm	deg	16782181	Point 19	ok	11.299512	107.300003	87.936934	
0	2.3	mm	deg	16782272	Point 64	ok	52.05148	116.100021	10.928881	
1	2.3	mm	deg	16782260	Point 58	ok	107.6	43.458598	30.333234	
2	2.3	mm	deg	16782175	Point 16	ok	107.299997	107.300003	88	
3	2.3	mm	deg	16782189	Point 23	ok	107.200006	42.54986	69.180472	
4	2.3	mm	deg	16782199	Point 28	ok	99.58179	115.700027	68.758212	
5	2.3	mm	deg	16782210	Point 33	ok	3.858682	115.700027	68.751664	
6	2.3	mm	deg	16782185	Point 21	ok	115.400003	11.495116	68.939551	
7	2.3	mm	deg	16782204	Point 30	ok	67.487424	115.700027	68.739155	
8	2.3	mm	deg	16782216	Point 36	ok	107.6	11.099991	59.299995	
9	2.3	mm	deg	16782191	Point 24	ok	107.201707	59.099998	69.031031	
0	2.3	mm	deg	16782195	Point 26	ok	107.200006	91.59593	68.934238	
1	2.3	mm	deg	16782208	Point 32	ok	19.973217	115.700012	68.729595	
2	2.3	mm	deg	16782212	Point 34	ok	-11.871431	115.700012	68.768078	
3	2.3	mm	deg	16782197	Point 27	ok	107.159314	107.100006	68.907495	

As you see, the points are in a random order. Order these by clicking the 'name' arrow, sorting by A to Z, and if needed fix the order of 'point 1' to 'point 9' manually by adding a zero and re-sorting:

version	length_unit	angle_unit	id	name	state	x	y	z	result
2.3	mm	deg	16782145	Point 01	ok	107.299997	51.291418	97.643072	
2.3	mm	deg	16782147	Point 02	ok	107.299997	99.299988	97.700005	
2.3	mm	deg	16782149	Point 03	ok	91.515561	99.299988	97.656413	
2.3	mm	deg	16782151	Point 04	ok	83.300012	99.201001	97.646473	
2.3	mm	deg	16782153	Point 05	ok	67.186678	99.299927	97.622911	
2.3	mm	deg	16782155	Point 06	ok	51.473409	99.299927	97.612752	
2.3	mm	deg	16782157	Point 07	ok	35.418228	99.299927	97.634862	
2.3	mm	deg	16782159	Point 08	ok	19.200006	99.262141	97.607981	
2.3	mm	deg	16782161	Point 09	ok	3.5343	99.299988	97.64511	
2.3	mm	deg	16782163	Point 10	ok	-4.799994	99.294257	97.691018	
2.3	mm	deg	16782165	Point 11	ok	-20.580236	99.299988	97.658452	
2.3	mm	deg	16782167	Point 12	ok	107.439518	27.300003	87.922682	
2.3	mm	deg	16782169	Point 13	ok	107.285818	42.310526	88.100012	
2.3	mm	deg	16782171	Point 14	ok	107.277543	59.148526	88.099991	
2.3	mm	deg	16782173	Point 15	ok	107.245795	74.319381	88.099991	
2.3	mm	deg	16782175	Point 16	ok	107.299997	107.300003	88	
2.3	mm	deg	16782177	Point 17	ok	75.299997	107.238009	87.970049	
2.3	mm	deg	16782179	Point 18	ok	43.299997	107.200158	87.996371	
2.3	mm	deg	16782181	Point 19	ok	11.299512	107.300003	87.936934	
2.3	mm	deg	16782183	Point 20	ok	-20.435907	107.300003	87.948727	
2.3	mm	deg	16782185	Point 21	ok	115.400003	11.495116	68.939551	
2.3	mm	deg	16782187	Point 22	ok	115.391356	27.099991	68.928391	
2.3	mm	deg	16782189	Point 23	ok	107.200006	42.54986	69.180472	
2.3	mm	deg	16782191	Point 24	ok	107.201707	59.099998	69.031031	
2.3	mm	deg	16782193	Point 25	ok	107.19419	75.100006	68.900755	
2.3	mm	deg	16782195	Point 26	ok	107.200006	91.59593	68.934238	
2.3	mm	deg	16782197	Point 27	ok	107.159314	107.100006	68.907495	
2.3	mm	deg	16782199	Point 28	ok	99.58179	115.700027	68.758212	
2.3	mm	deg	16782202	Point 29	ok	83.839957	115.700012	68.712055	

Copy the X Y and Z columns to a new workbook, convert the mm to cm, and add a header line for in XMALab (x, y, z on row 1)
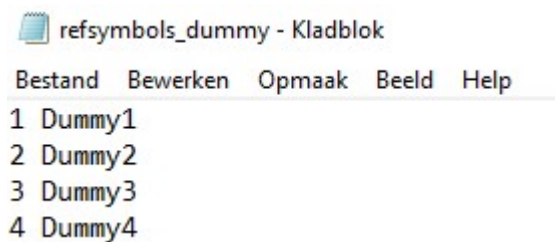

and save these three columns as .csv.

Check whether Excel has exported with ',' as the delimitor, and not ';'. If so, open in a text editor, and replace (Control H in Notepad; saving as 'all files' adding a .csv to the filename in Notepad):
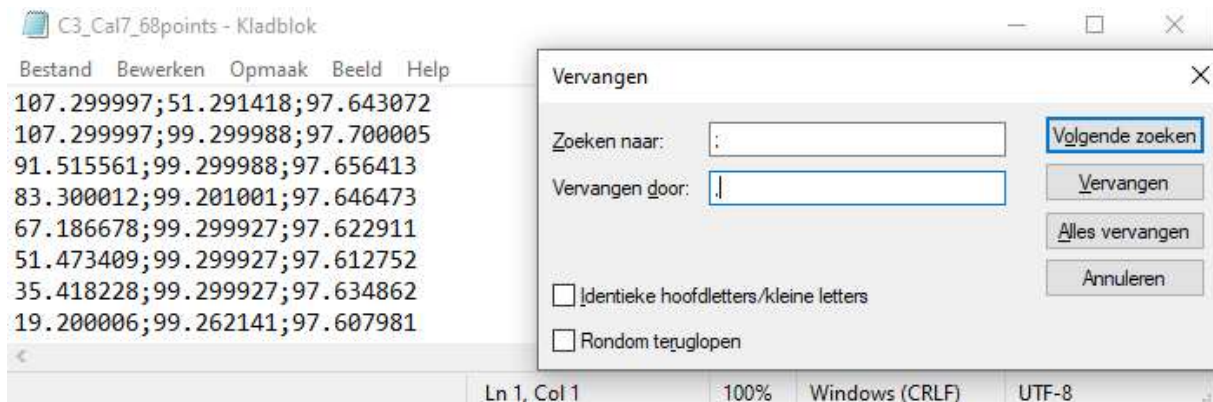
Notes on Optic camera calibration in XMALab

Use the 'Cube' method, without Undistortion. Use a dummy .ref file like this:

Bug: When using the 'External Calibration' mode in XMALab, i.e. calibration via the MayaCam 2.0 files, the 'Load Mayacam 2.0' function did not work (XMALab v 1.5.4). Manual Copy and Pasting from the MayaCam files opened in a text editor seems the way to go for the moment.