

Questionnaire for estimating the cost of a 3D laser scan:

No.	Question	Answer
1	How many buildings should be scanned?	number: ____
2	How many rooms and floors do the respective buildings have?	building 1: rooms: ____ floors: ____
3	Should the buildings be scanned inside and outside?	inside: yes / no outside: yes /no
4	How much floor space does a building have?	building 1: _____ m ²
5	How high is the floor or building height?	building 1: floor 1: ____ m floor 2: ____ m
6	Is the scan to be carried out during ongoing production with transport and passenger traffic?	yes/ no
7	What is to be captured during the scan?	Buildings: Walls, columns, roof incl. construction, TGA Inventory: Machines, plants, workplaces, switch cabinets, media lines Other: _____
8	What ambient temperature is to be expected and are there any unusual emissions (dust, humidity) to be considered?	ambient temperature: ____°C (approx.) emissions: ____
9	At what times can I scan?	Mon, Tue, Wed, Thur, Fri, Sat, Sun 6 a.m. to 2 p.m., 2 p.m. to 10 p.m., 10 p.m. to 6 a.m. Other: _____
10	Are there floor plans or layout plans for the floors or buildings?	if yes, please make available if no, on-site appointment necessary
11	Are there representative photos for the areas to be scanned?	if yes, please make available if no, on-site appointment necessary

Questionnaire for effort estimation of a modeling based on a 3D laser scan:

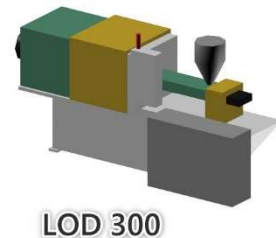
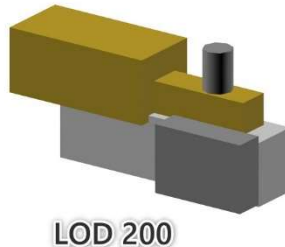
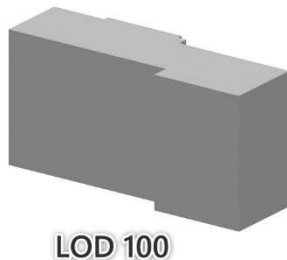
No.	Question	Answer
1	Which objects are to be modelled?	Buildings: Walls, columns, roof incl. construction, TGA Inventory: Machines, plants, workplaces, switch cabinets, media lines Other: _____
2	How should the objects be modeled?	2D or 3D
3	In which level of detail should the objects be modeled? (Overview see the following pages)	LoD 100 LoD 200 LoD 300
4	How many objects can be modelled independently of the building?	number: __
5	Should the layout with the objects be mapped in the planning system on the basis of the laser scan data?	yes / no

Equipment (1): Level of Detail (LOD) for factory layout planning



product image: Arburg

The following illustration shows possible LOD levels or simplifications of **equipment (machines)**.

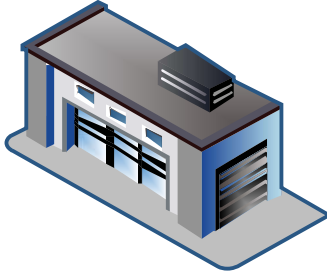


LOD 100	LOD 200	LOD 300
Projected floor plan and extrusion at maximum height (with periphery or connection to other units, outlets and feed lines to central TGA are to be considered separately)	Primitive modelling of partial heights and main aggregates/functional units with design at the discretion of the modeling expert* (e.g. machine, work area, material feed, switch cabinet, elevation)	In addition to LOD 200 primitive modelling of relevant auxiliary equipment (e.g. panel, luminaire, essential media connections, drive)
Block model	Standard model	Detailed model
1 color	similar to real object approx. 5 colors	similar to real object approx. 10 colors

IMPORTANT!: In any case, the size of the installation area and maximum height are guaranteed for use in layout planning. Envelope models of the equipment are generated. Photo texturing is an option that is not shown in the image series above.

*Based on the data quality and type of object, the concrete design of models takes place..

Building: Level of Detail (LOD) for factory layout planning



Picture: schematic building representation

In the following illustration, possible LOD levels or simplifications of **buildings and TGA** can be seen.



LOD 100	LOD 200	LOD 300
Projected floor plan and extrusion at maximum height or boundary frame as block, TGA areas as block, max. large main lines and pipes	Primitive modelling of partial heights such as wall/light openings with design at the discretion of the modeling expert* (windows, doors, gates), simplified TGA (steel construction, pipes, piping, shafts)	In addition to LOD 200 primitive modelling of relevant details (doors, gates, glazing), details TGA (steel construction, pipes, piping, shafts)
Block model	Standard model	Detailed model
1 color	similar to real object approx. 5 colors	similar to real object approx. 10 colors

IMPORTANT!: All LODs use outer sleeves and do not depict interiors. In any case, the size of the imaginary outer shell is guaranteed as a block/rectangle and the maximum extension is guaranteed for use in layout planning.

*Based on the data quality and type of object, the concrete design of models takes place.

Equipment (2): Level of Detail (LOD) for factory layout planning



product image: IMK System

The following illustration shows possible LOD levels or simplifications of **equipment (assembly)**.



LOD 100



LOD 200



LOD 300

LOD 100	LOD 200	LOD 300
Projected floor plan and extrusion at maximum height	Primitive modelling of partial heights and main aggregates/functional units with design at the discretion of the modeling expert* (machine, working area, material feed, switch cabinet)	In addition to LOD 200 primitive modelling of relevant auxiliary units (panel, luminaire, essential media connections, mounting, drive, etc.)
Block model	Standard model	Detailed model
1 color	similar to real object approx. 5 colors	similar to real object approx. 10 colors

IMPORTANT!: All LODs use outer sleeves and do not depict interiors. In any case, the size of the imaginary outer shell as a block/block and the maximum extension are guaranteed for use in layout planning.

*Based on the data quality and type of object, the concrete design of models takes place.