Leica 3D Disto

Tutorial
About DXF

PART OF HEXAGON

- when it has to be **right**

Leica Geosystems

Advice…

This document contains some general information about DXF data.

Skip to the last pages if you are only interested in details concerning the Leica 3D Disto.

DXF in general

DXF (Drawing Interchange Format) is a file format for CAD data import and export, developed by AutoDesk®

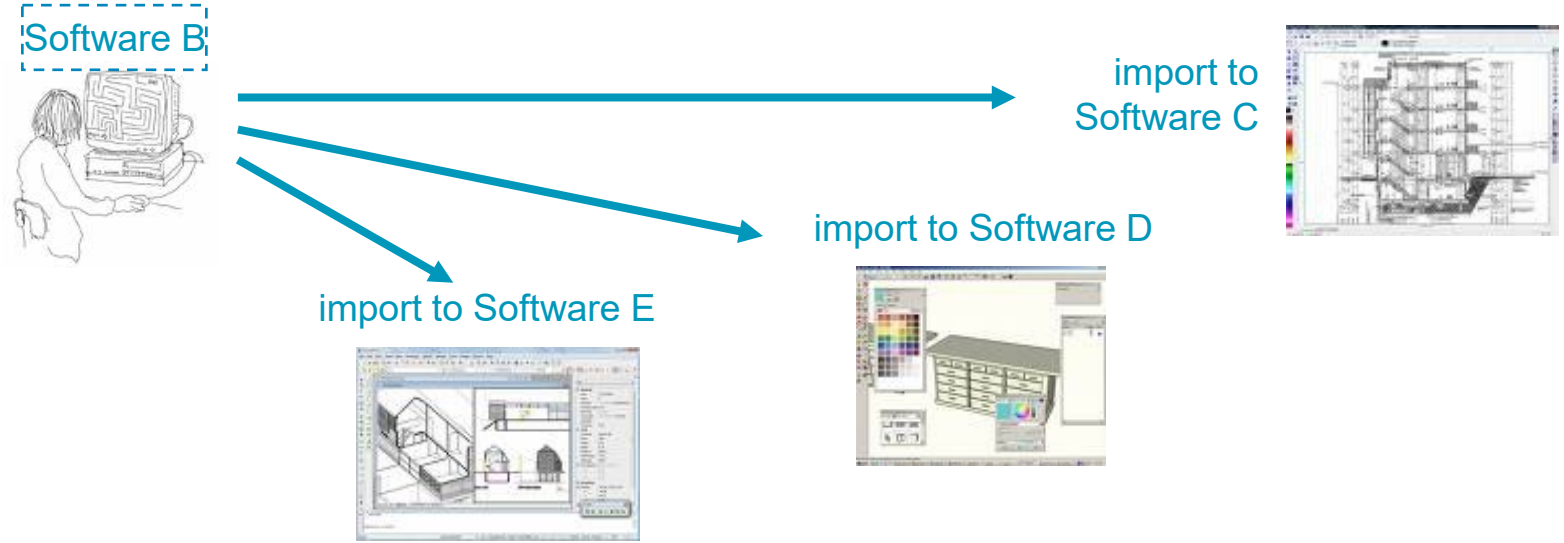
CAD software „A“

Convert to DXF

import to CAD software „B“

History of DXF

It became a worldwide standard format for CAD data transfer.



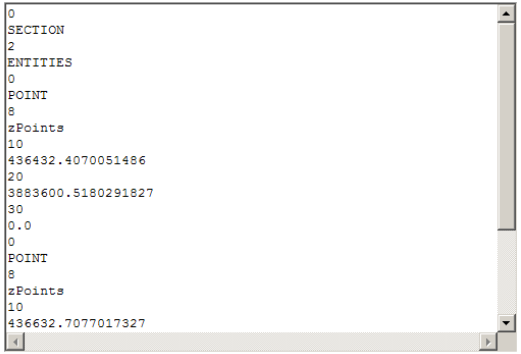
What format is „DXF“?

CAD data format =
powerful & complex

DXF data format =
simple & editable text format

```
0
SECTION
2
ENTITIES
0
POINT
8
zPoints
10
436432.4070051486
20
3883600.5180291827
30
0.0
0
POINT
8
zPoints
10
436632.7077017327
```

Pros and Cons of the DXF format



- open format
- text file = easy to handle
- worldwide standard

- lots of CAD automatisms are lost
- some contents are lost

Data quality decreases with each DXF export

Original data

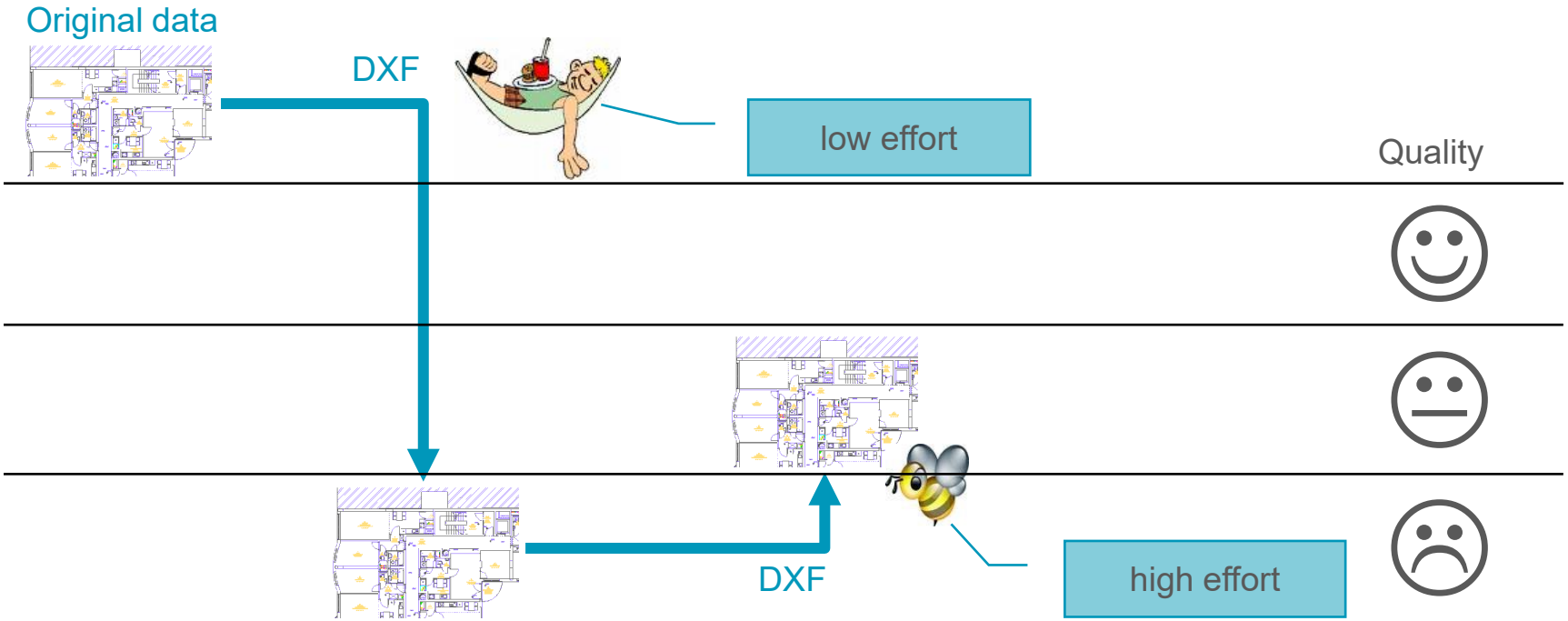
DXF

DXF

DXF

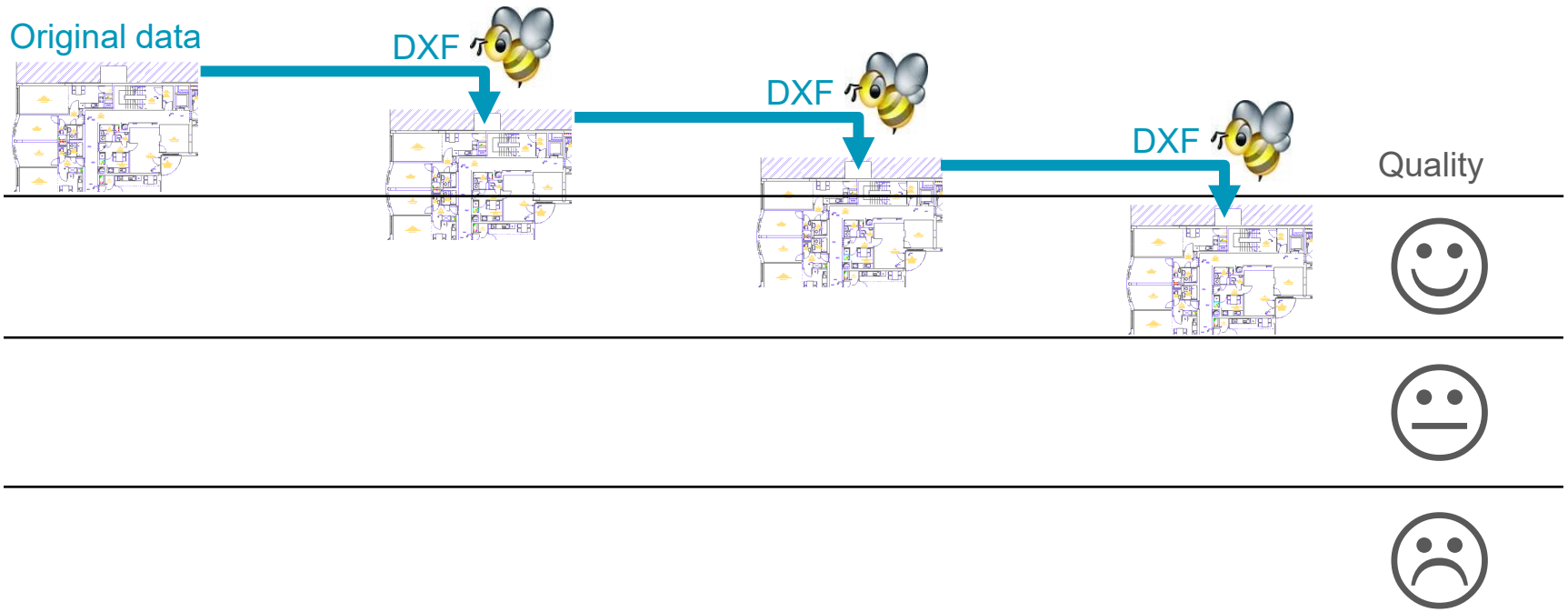
Quality

Once lost, data quality is hard to repair



- when it has to be right

Diligence at import/export keeps high quality



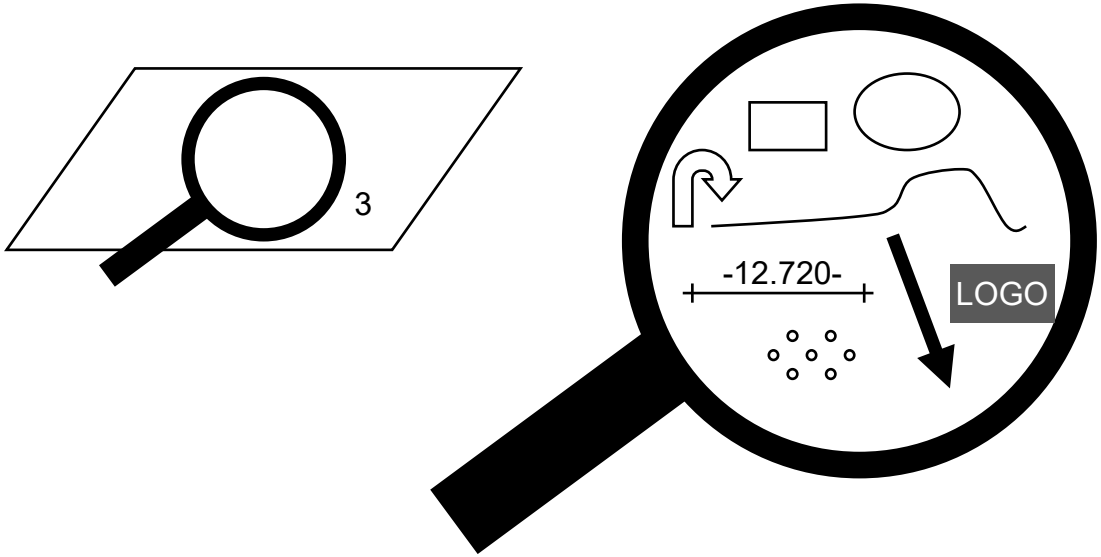
- when it has to be right

Structure of CAD files

Most CAD systems use a LAYER STRUCTURE:

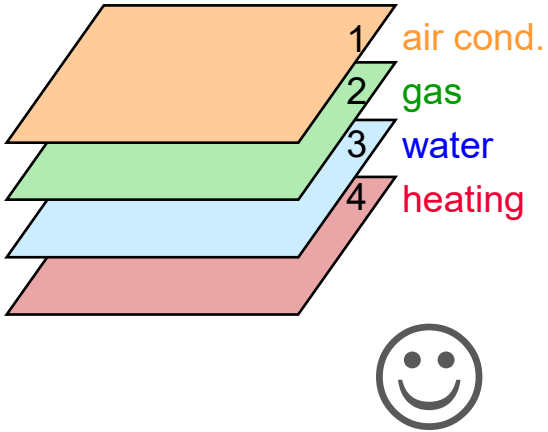
CAD layer contents

Each layer can contain different data: lines, polylines, points, texts, bitmaps, curves/splines, icons, hatchures, 3D-models, etc…

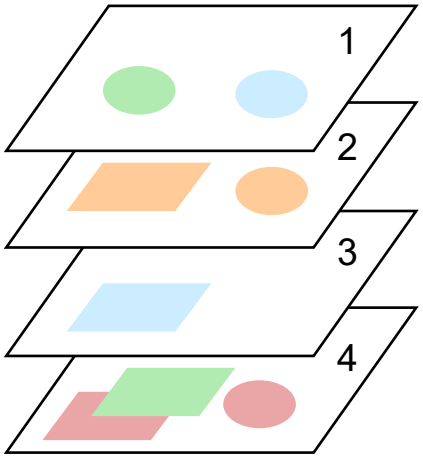


Diligence with Layers

‚good' layers: content is separeted

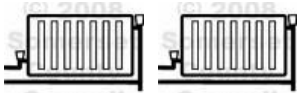


‚bad' layers: content is mixed



Worth knowing

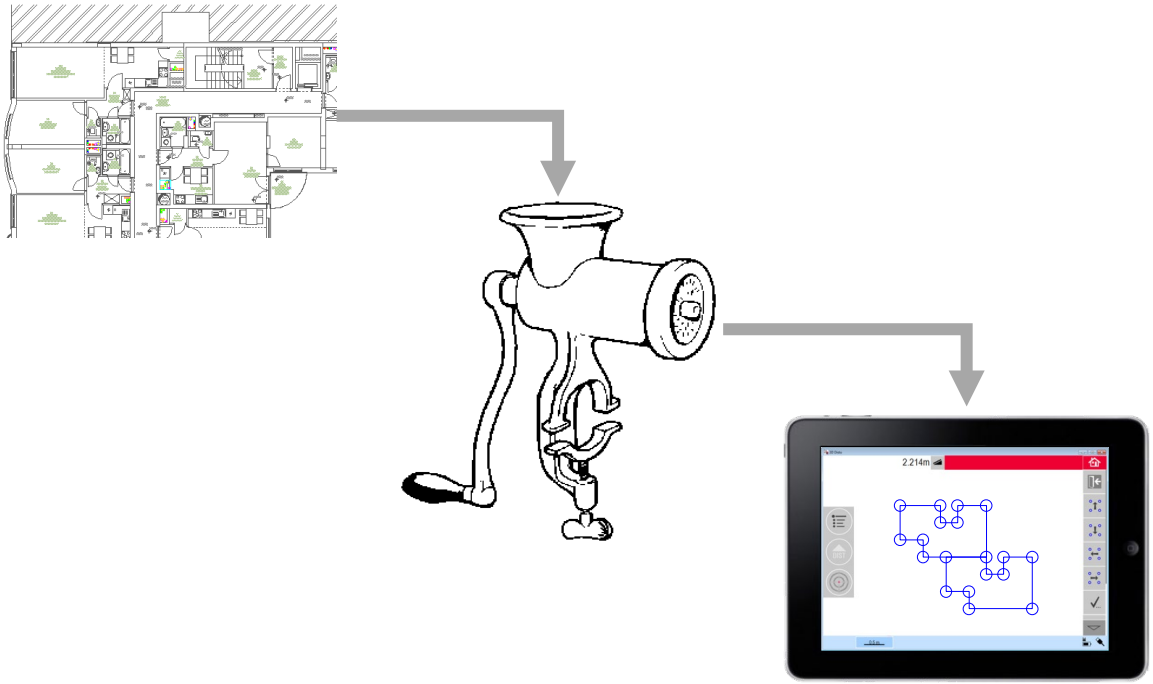
- „Blocks“:
  A block is like a separate drawing, which can repeat very often.
  The user must tell the system how to handle them at import: ignore/explode/scale… etc.



- Colours and line styles:
  DXF is not able to handle colors or line styles. Only ‚pen numbers‘ are managed → imported DXF data never look like the original data
- Splines are complex curves that can not be represented by radiuses. DXF can’t handle splines and divides them to a huge number of short straight lines with lots of points.

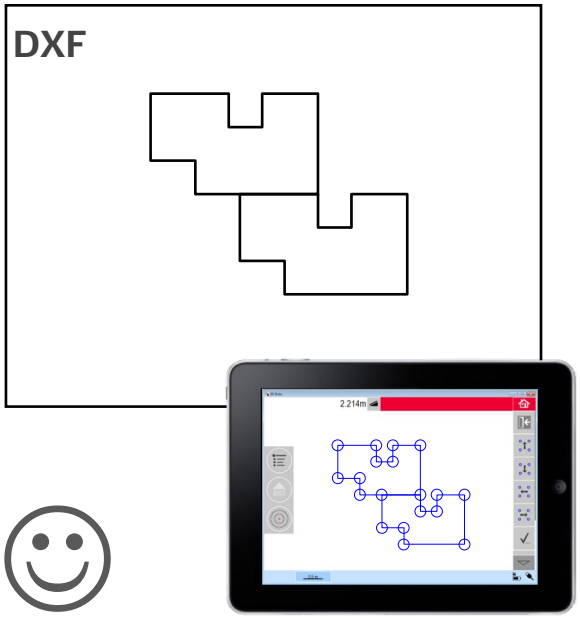
- Coordinate systems:
  Manipulation of the coordinate system (rotating, moving, scaling, etc.) has impact on accuracy and import/export.
- Units:
  A DXF file doesn’t contain information about units. Therefore it is important to have identical unit settings in the softwares that exchange DXF data.

How to optimize a DXF file for the 3D Disto

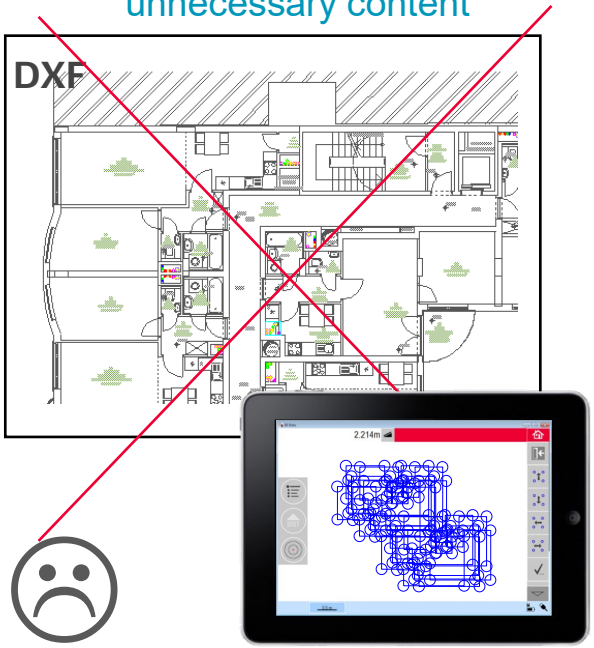


How to optimize a DXF file for the 3D Disto

reduced content



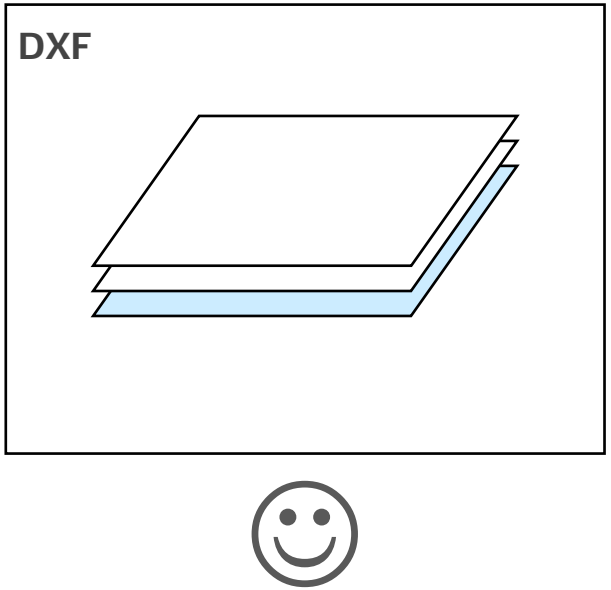
unnecessary content



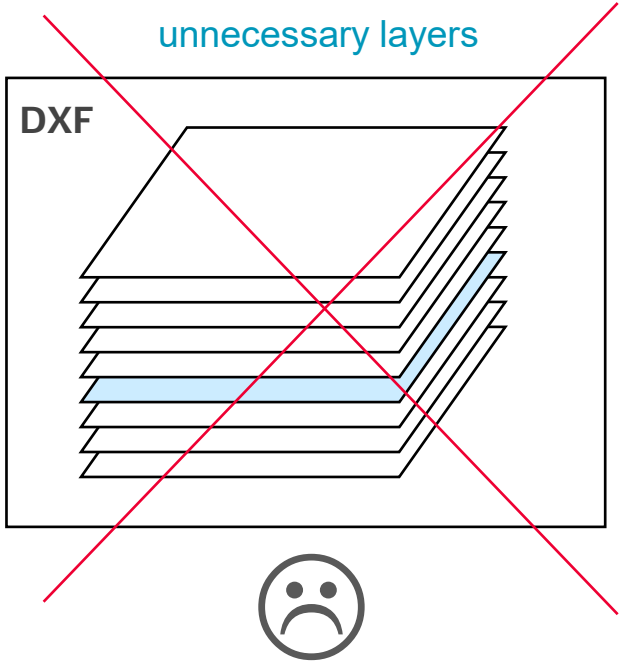
- when it has to be right

How to optimize a DXF file for the 3D Disto

reduced number of layers

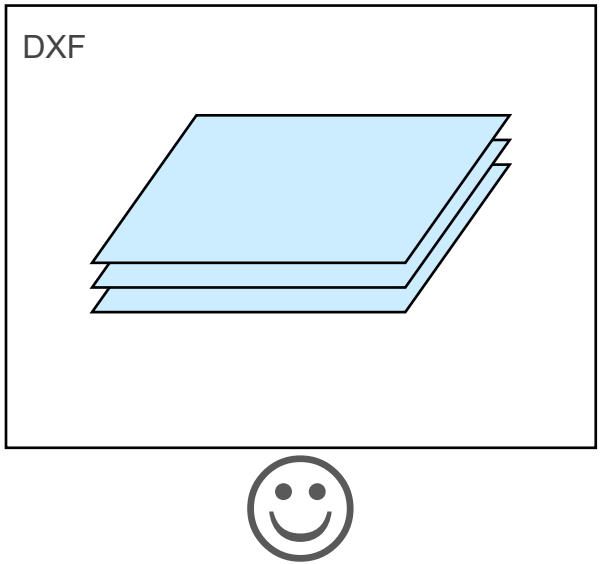


unnecessary layers

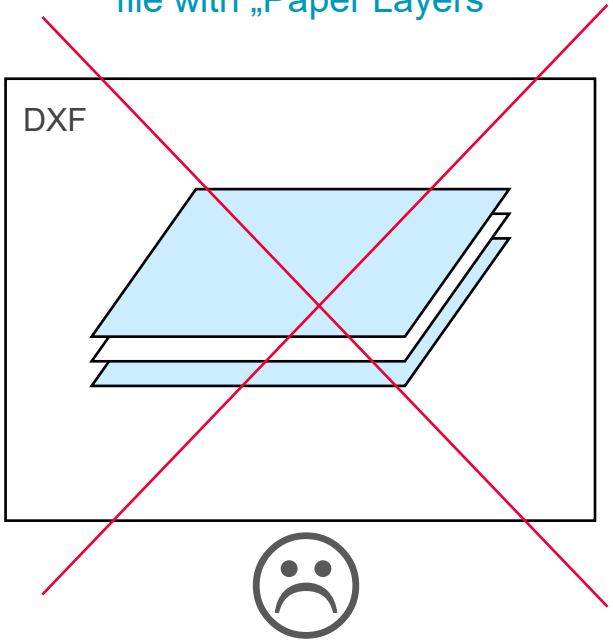


How to optimize a DXF file for the 3D Disto

file without „Paper Layers“
(only Model Layers)

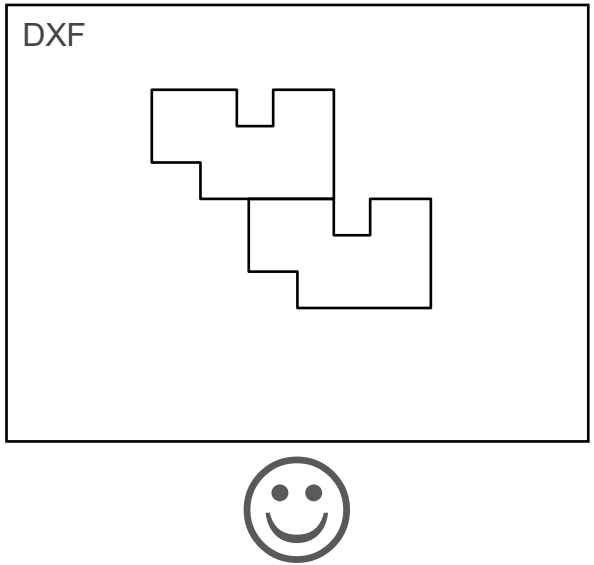


file with „Paper Layers“

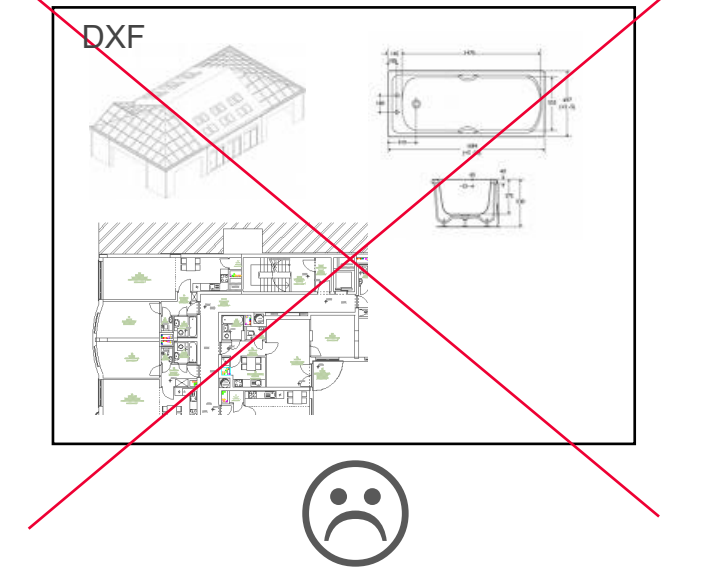


How to optimize a DXF file for the 3D Disto

1 drawing per file

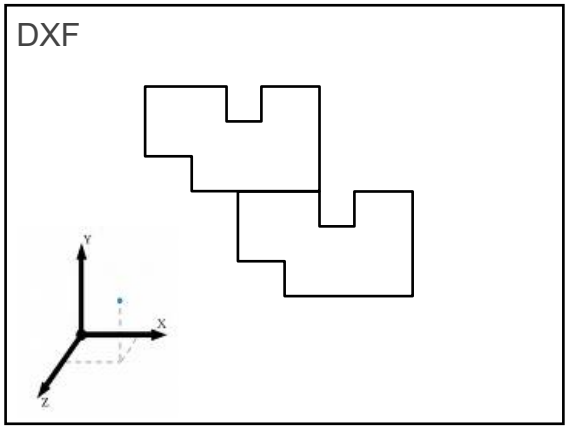


several drawings, perspectives, details, unvisible contents, etc. in one file

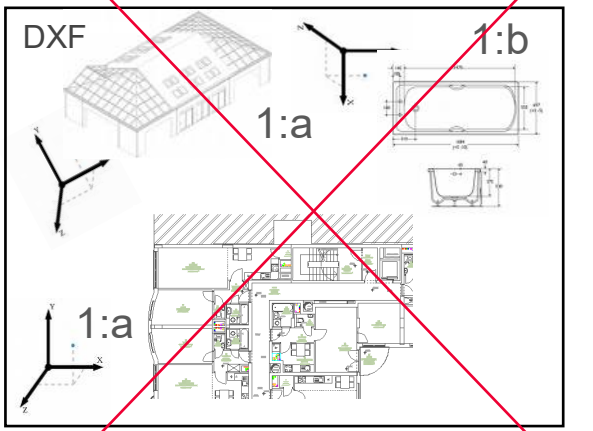


How to optimize a DXF file for the 3D Disto

1 coordinate system
1 scale



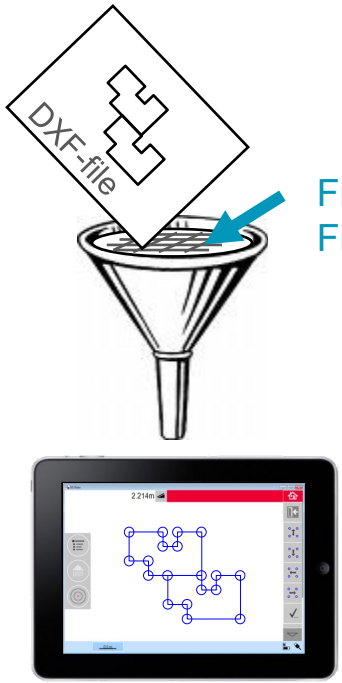
several coordinate systems,
different scales



What DXF contents does the 3D Disto accept?

Imported elements:

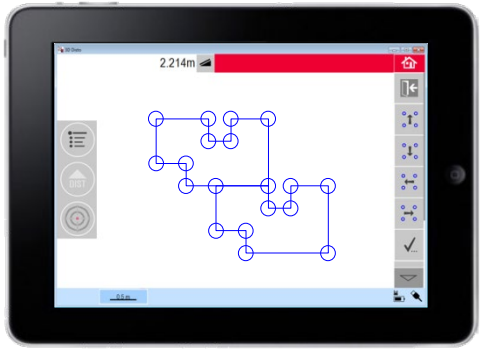
- lines
- centre points of circles
- singular points
- line end points
- polylines, 3D-polylines and lightweight-polylines
- block reference points



Filter in 3D Disto‘s File Manager

Hierarchy of imported elements and coordinates:

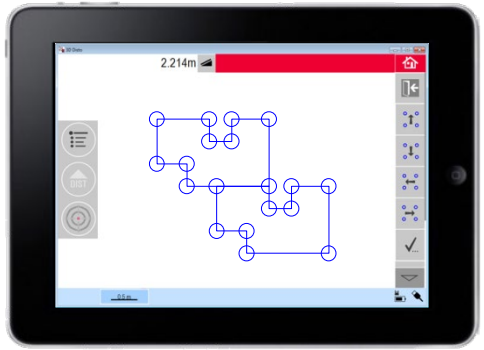
- only Root elements are imported, no Block contents
- coordinates are imported 1:1 (no scaling, no rotation, no offset)
- the full dimension of the data is imported, equal to the CAD ‚Zoom All‘ function
- X and Y coordinates are imported, Z (height) is ignored



‚Purging‘ the data

User-defined or undefined colours or line types cause import problems to any software. Even if you delete such data some layers or blocks might still be existing.

→ It is recommended to execute the PURGE command several times before you generate a DXF file.



Versions

Importable versions:

- [StringValue("AC1009")] AutoCad12,
- [StringValue("AC1012")] AutoCad13,
- [StringValue("AC1014")] AutoCad14,
- [StringValue("AC1015")] AutoCad2000,
- [StringValue("AC1018")] AutoCad2004,
- [StringValue("AC1021")] AutoCad2007

Exported version:

- [StringValue("AC1009")] AutoCad12

Leica 3D Disto

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- manuals

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