Transform AutoCAD Drawing to Intelligent Design Objects Using Mechanical Toolsets.

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About the speaker

Vinod Kumar Balasubramanian is currently a senior technical lead for AutoCAD toolsets software. He is responsible for handling business escalations on support issues, preparing partners for new releases, creating high-quality knowledge content, and helping to improve total experience of product for customers.

Sridhar Subramani has more than 20 years of CAD experience, working as Senior Product Owner at Autodesk, Inc. A frequent presenter at AutoCAD University for the last 6 years. A seasoned professional in software testing, he has also been actively involved in news groups of AutoCAD Mechanical software and AutoCAD Architecture software and resolved over 1500 issues reported by customers. Sridhar conducts in-house training in AutoCAD and AutoCAD Toolsets. He has written several technical solutions that are published on the Autodesk support website.

Class Summary

In this class, we'll introduce you to simple and powerful features in mechanical toolsets that help you transform your AutoCAD drawing into smart-drawing entities that can help increase productivity and efficiency. We'll do a simple walk-through of converting your AutoCAD tables to a smart BOM database. You'll learn an automatic dimensioning feature under power tools to make your drawing annotation simpler and faster. Later, we'll add intelligent balloons to the drawing views that you've created in AutoCAD using model documentation. Finally, we'll utilize the drawing design standards in AutoCAD Mechanical software to make your drawing views and annotations adhere to your company standards and create effectiveness to save costs and time with your drawing maintenance.

Key learning objectives

At the end of this class, you will be able to:

- Learn how to convert an AutoCAD table to an intelligent BOM
- Learn how to utilize Auto Dimension in Power tools to annotate drawing views
- Learn how to use the ballooning feature to create smart annotations
- Learn how to simplify AutoCAD objects to adhere to drawing design standards

Phases/Stages

STAGE A

CREATE YOUR DESIGN

Simplify AutoCAD objects to adhere to new design standards for AutoCAD.

STAGE B

HANDLE EXISTING DATA

Convert existing AutoCAD data to an intelligent BOM based drawing.

STAGE C

LEVERAGE POWER TOOLS

Utilize Power tools to annotate drawing and increase productivity.

STAGE D

CREATE SMART ANNOTATIONS

Use ballooning feature to create smart annotations in Mechanical.

Stage A

CREATE YOUR DESIGN

Standardization of Mechanical drawings

- ✓ Standards play crucial role in controlling geometry display in drawing.
- ✓ Saves time for configuring standards in non Mechanical drawings.
- ✓ Standards-based design that meets industry standards : such as **ANSI, ISO**, and **DIN**.
- ✓ AutoCAD Mechanical software has tools in place for AutoCAD drawing to maintain standards.

ANSI American National Standards Institute

DIN Deutsches Institut für Normung

ISO International Organization for Standardization

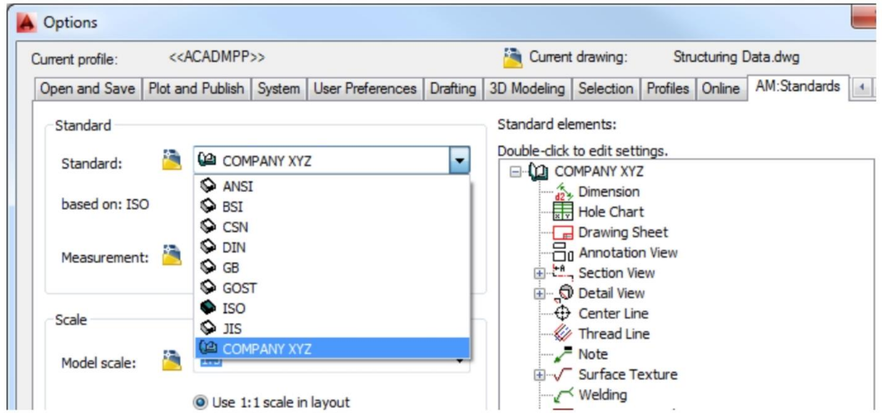
BSI British Standards

Standardization of Mechanical drawings

- ✓ Standards Window > Multiple elements : Single place to set drawing specifications to your company requirements.

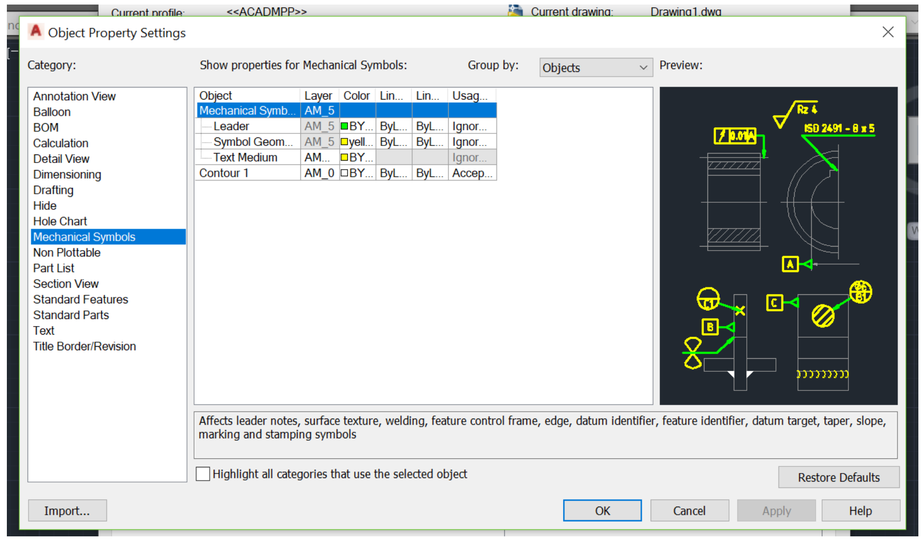
- ✓ Customizing an existing drawing standards include :

  - ❖ Changing assigned layer geometry
  - ❖ Changing how dimensions display
  - ❖ Selecting welding symbols
  - ❖ Defining information to BOM

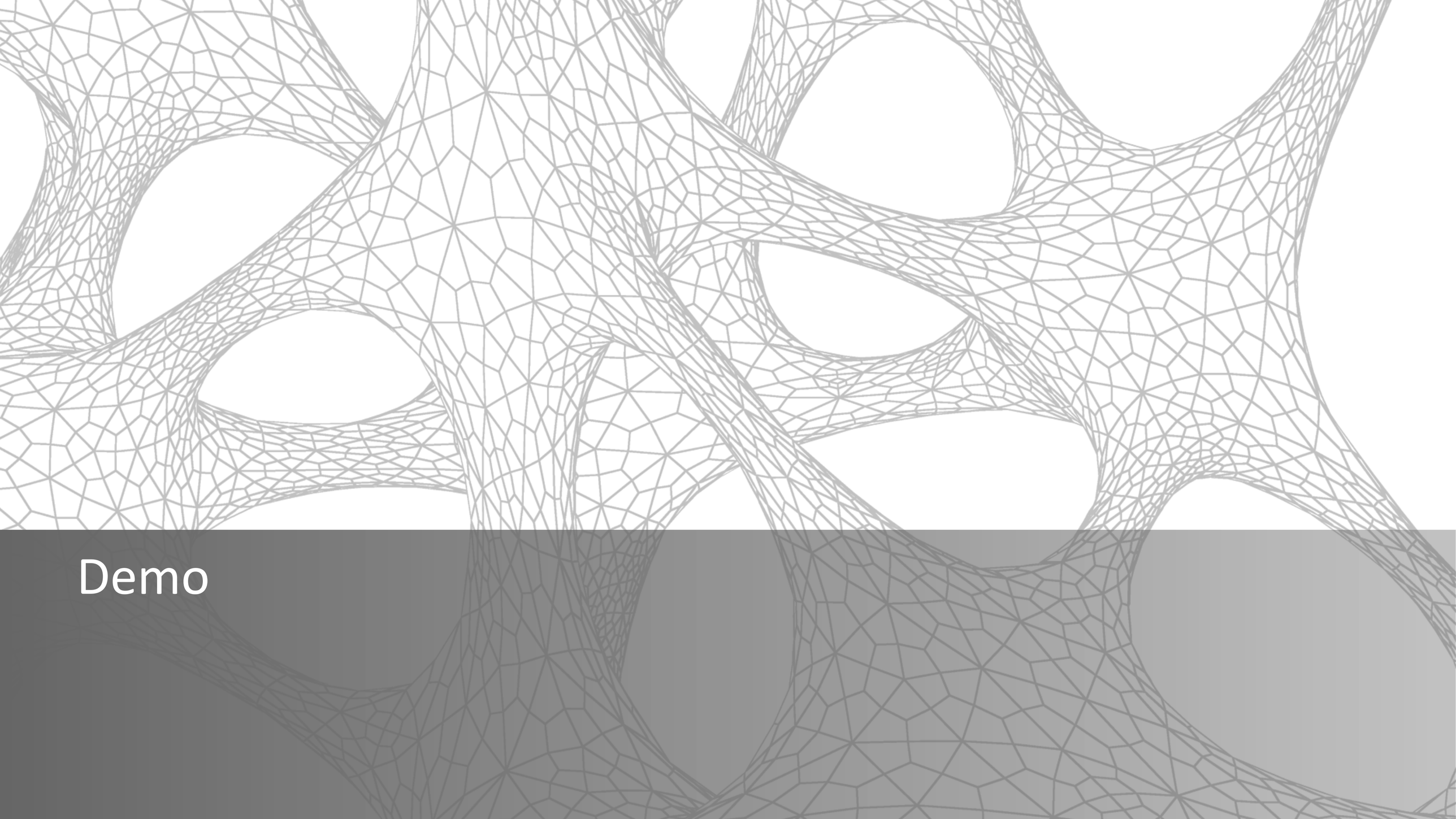


Standardization of Mechanical drawings

- ✓ Define everything in one place : Object Property Settings.
- ✓ Objects configured automatically and assigned on specific layers.



- ✓ Can be saved to a template :
  - ❖ In Options Dialog > AM: Standards tab > Default Standards Template.
  - ❖ Ability to import to non-AutoCAD Mechanical drawings.
  - ❖ Template controls drawing standardization.



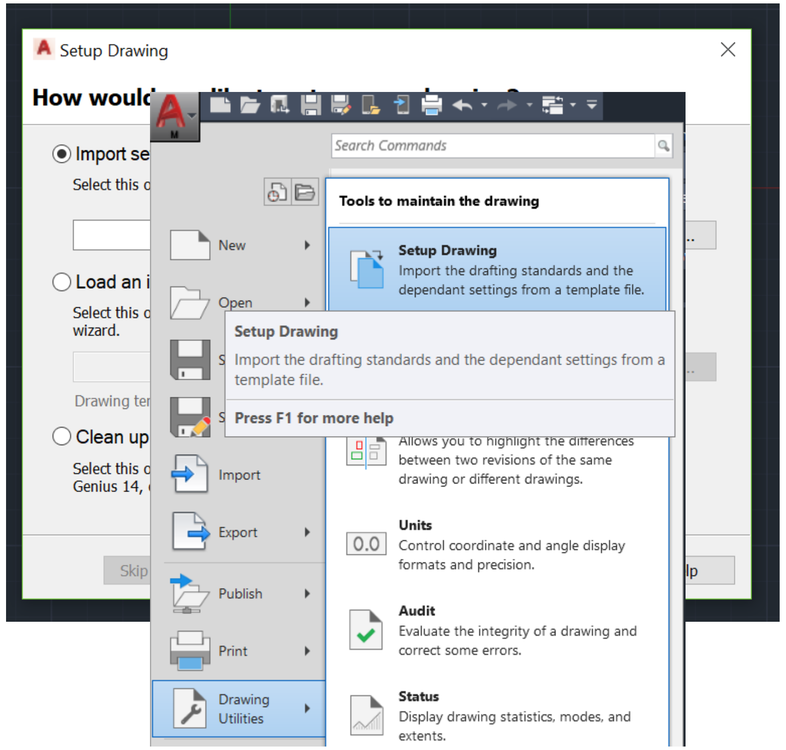
Demo

Stage B

HANDLE EXISTING DATA

Import design standards to AutoCAD Drawing

✓ Simple command will help you achieve it – **AMSETUPDWG**.



✓ **Things to note :**

- ✓ Avoid running AMSETUPDWG command in middle of a drawing session.
- ✓ Select the right import options :
  - ❖ Import all standards from a drawing template.
  - ❖ Import only selected standards.

BOM vs AutoCAD Table

AUTODESK®
AUTOCAD

Table

- Table is a self-contained object.
- Arranges rows and columns into a grid type array.
- Helps calculate quantity, cost of components manually.

BOM

- Intelligent table contains information on parts in the drawing.

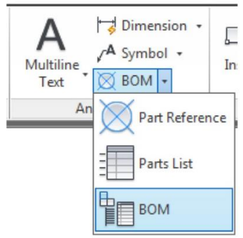
❖Several BOMs like table.

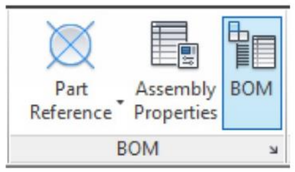
❖Parts, and Assemblies (components) included in the BOM automatically.

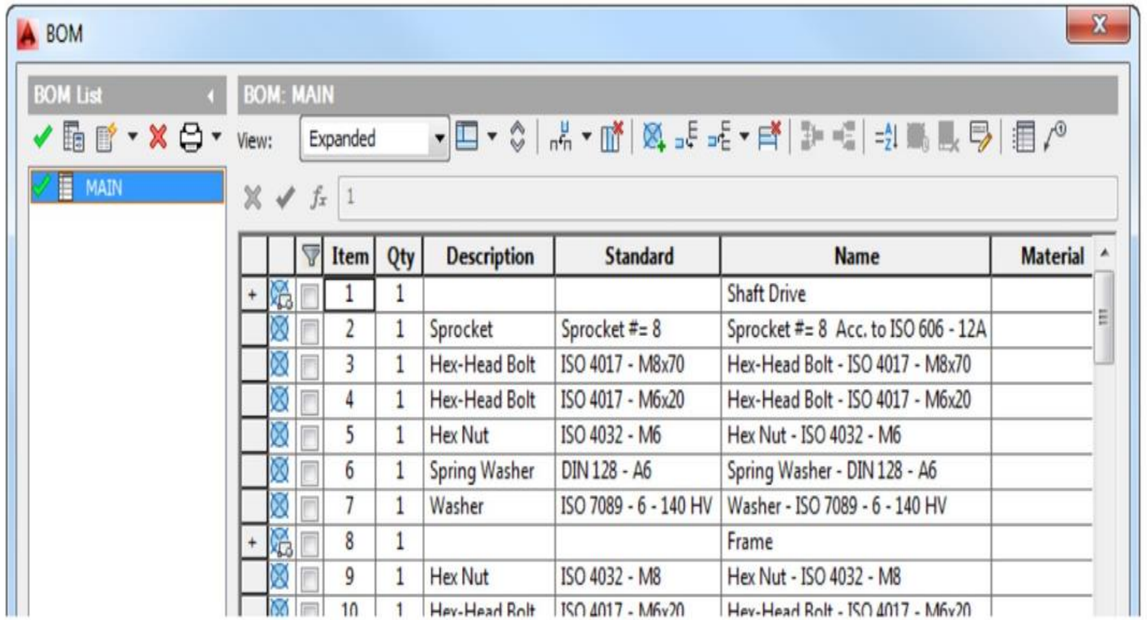
❖Easy to automate calculations in BOM.

How BOM works in Mechanical drawing

- ✓ **BOM** :
  - ❖ Database stored within your drawing.
  - ❖ Command Line : **AMBOM**

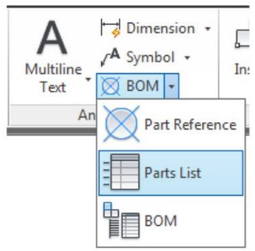


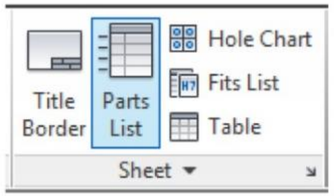


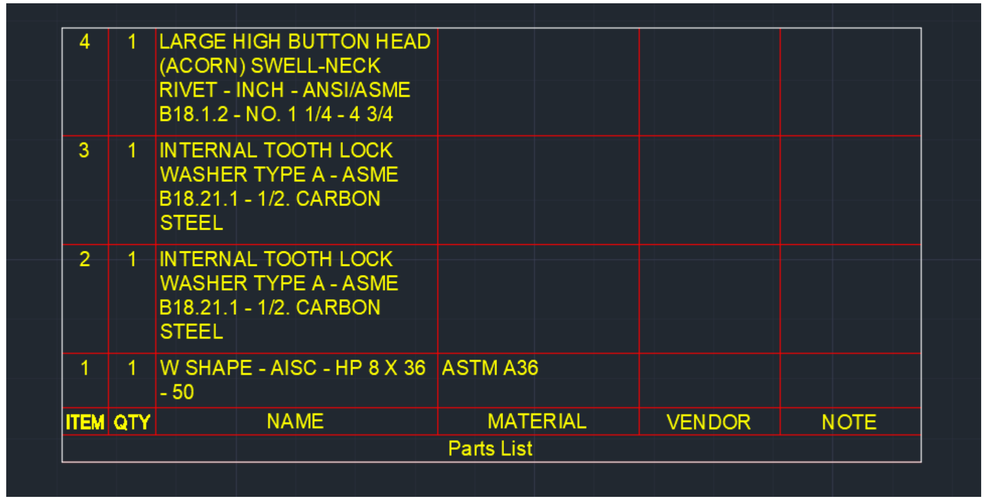


Connecting Parts list & BOM

- ✓ **Parts list :**
  - ❖ They are intelligent AutoCAD Tables.
  - ❖ Parts list displays data from the BOM.
  - ❖ Command Line : **AMPARTSLIST**





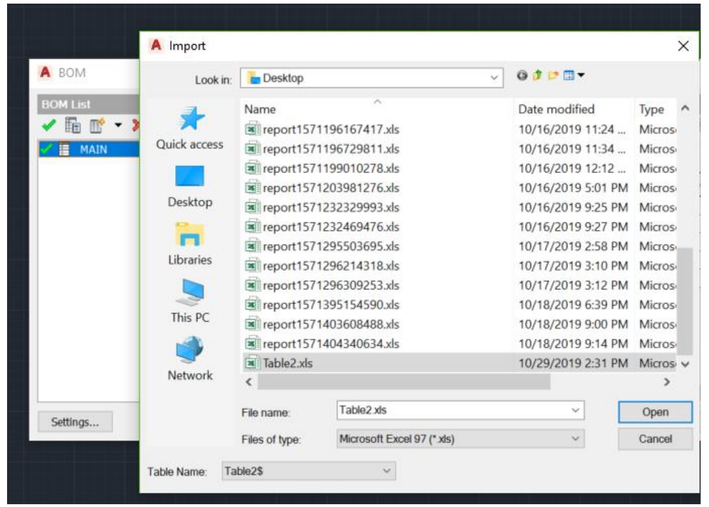


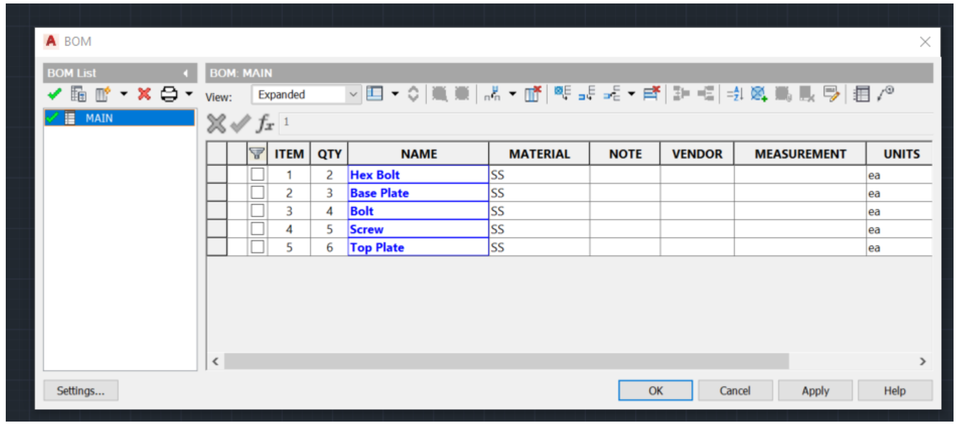
ITEM	QTY	NAME	MATERIAL	VENDOR	NOTE
4	1	LARGE HIGH BUTTON HEAD (ACORN) SWELL-NECK RIVET - INCH - ANSI/ASME B18.1.2 - NO. 1 1/4 - 4 3/4			
3	1	INTERNAL TOOTH LOCK WASHER TYPE A - ASME B18.21.1 - 1/2. CARBON STEEL			
2	1	INTERNAL TOOTH LOCK WASHER TYPE A - ASME B18.21.1 - 1/2. CARBON STEEL			
1	1	W SHAPE - AISC - HP 8 X 36 - 50	ASTM A36		

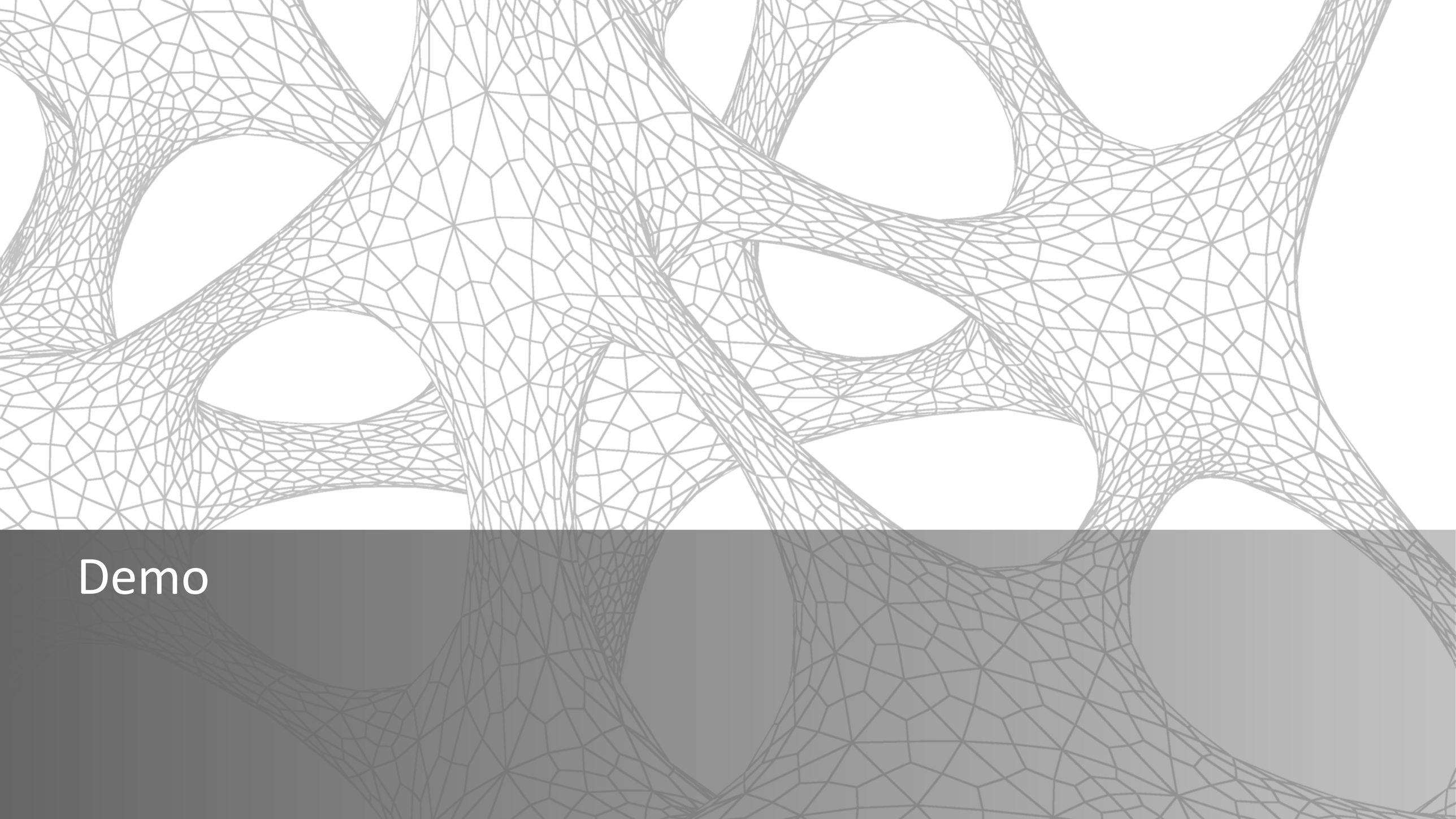
Parts List

Importing data from Table to Mechanical BOM

- ✓ Import data :
  - ❖ You can import / export both Parts list & BOM
  - ❖ AutoCAD Table can be imported to excel and modified to insert into Parts list & BOM.







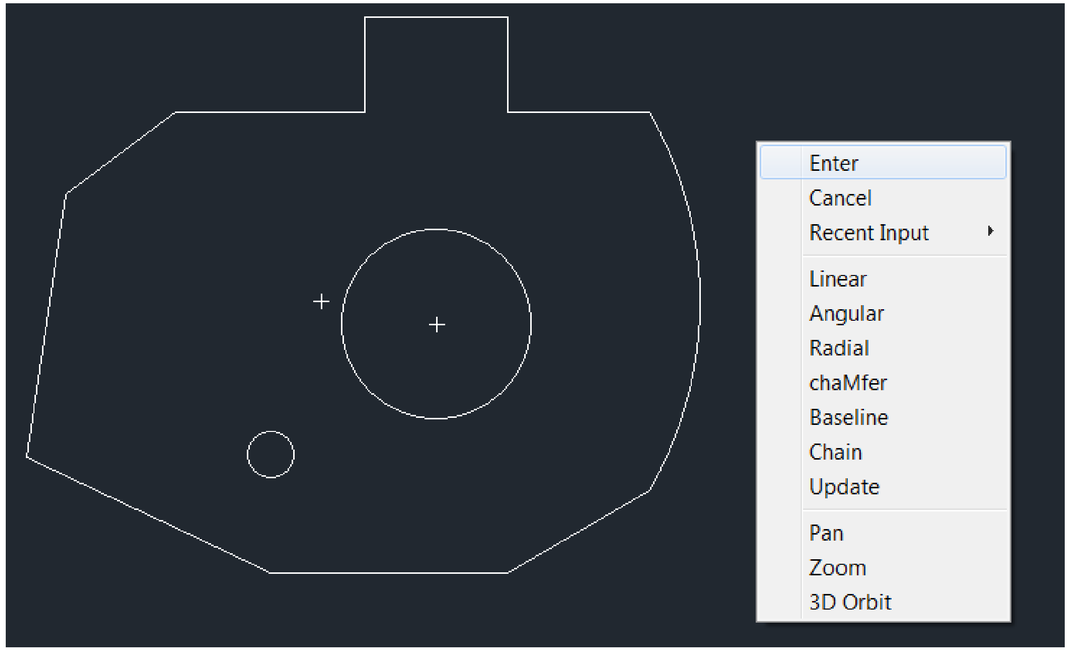
Demo

Stage C

LEVERAGE POWER TOOLS

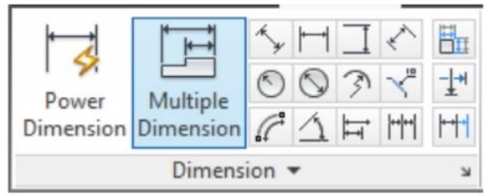
Create Multiple Dimension types using Power tools

- ✓ Single command :
  - ❖ Linear,
  - ❖ Angular,
  - ❖ Radial,
  - ❖ Diameter,
  - ❖ Baseline, and
  - ❖ Chain Dimensions.



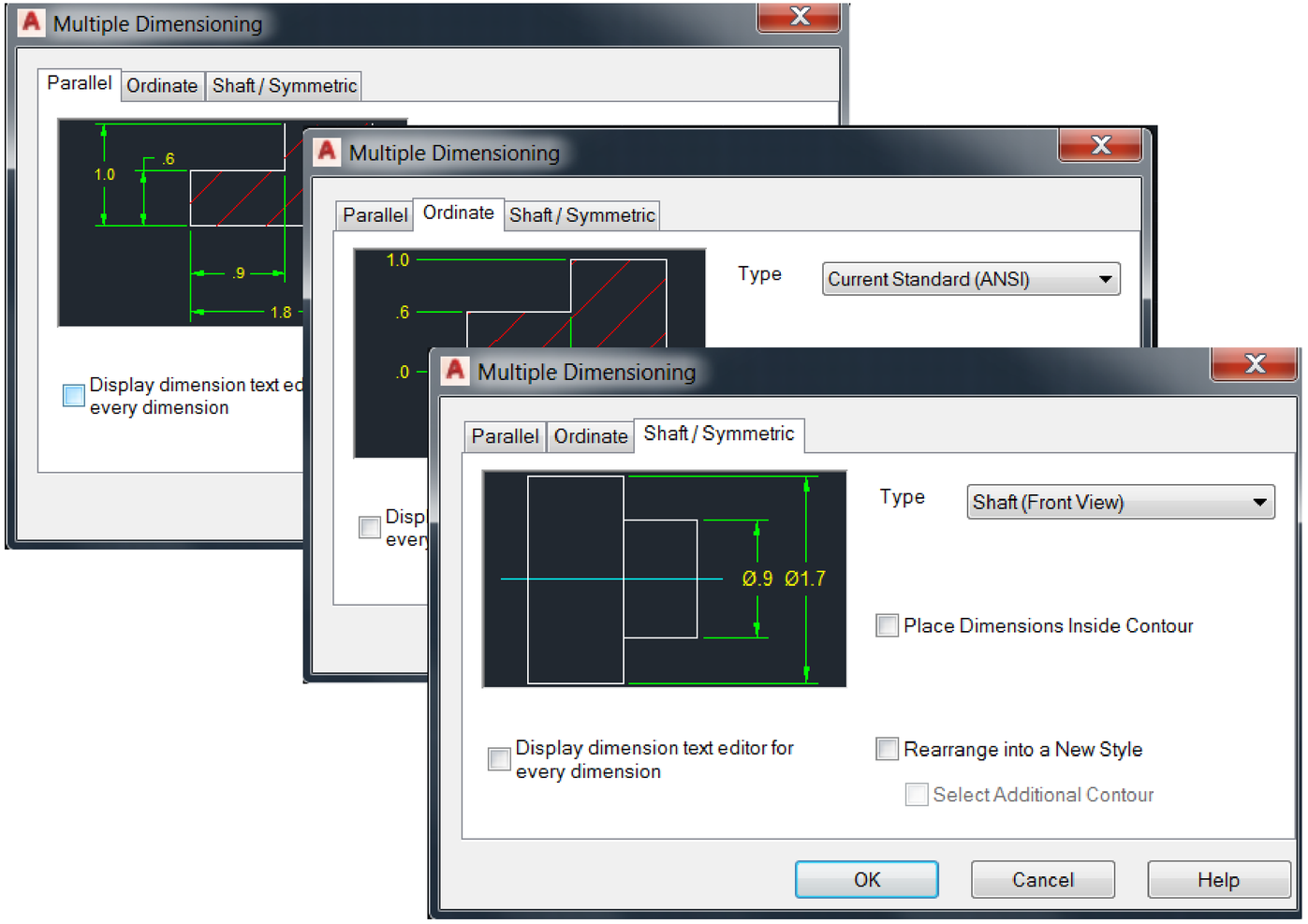
Auto Dimensioning in Mechanical

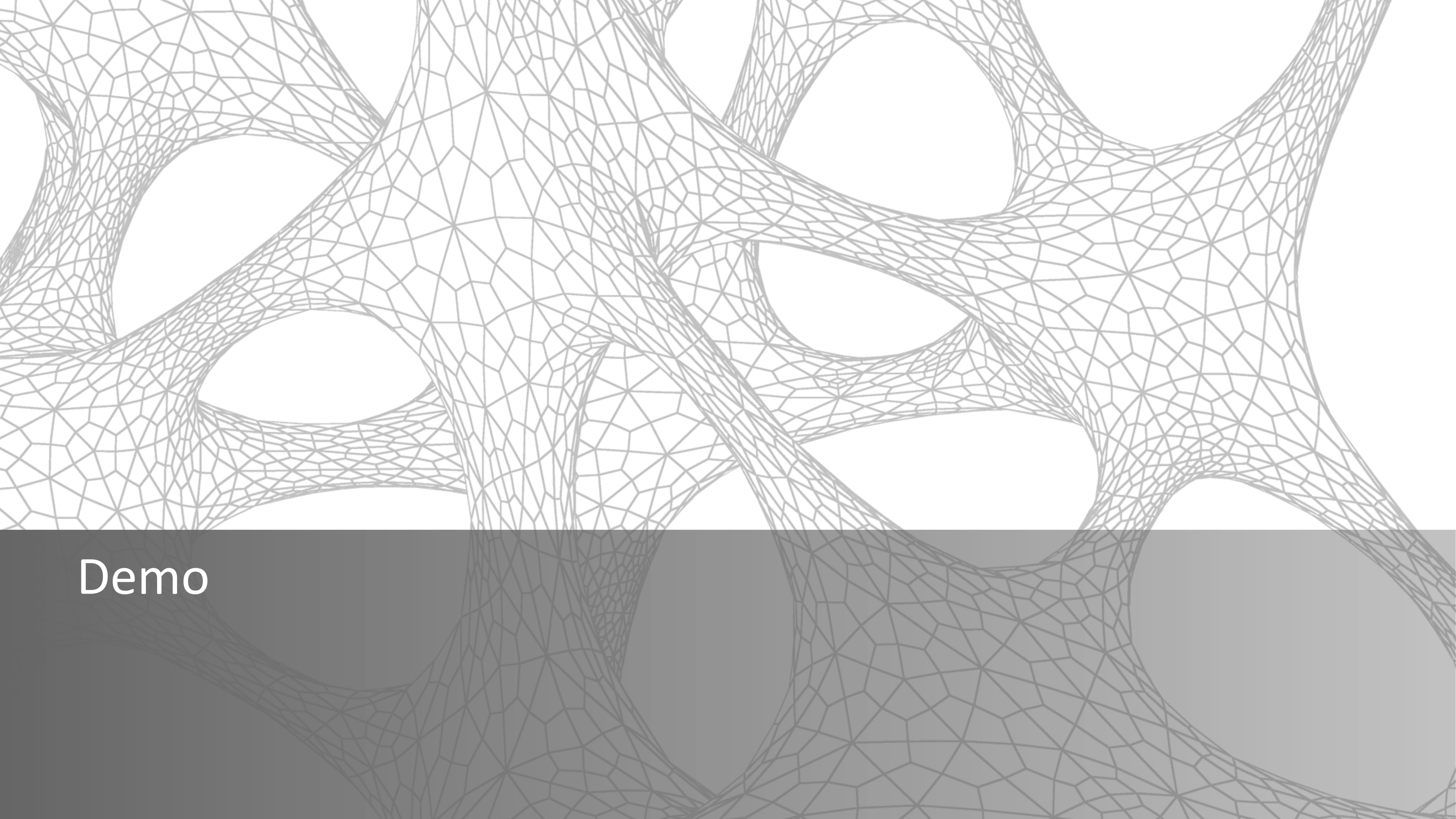
- ✓ In Ribbon under : Annotate tab > Dimension panel > Multiple Dimension
- ✓ Command Line: **AMAUTODIM**
  - ❖ Multiple automatic dimensions follow current mechanical drawing standards.
  - ❖ Dimensions are automatically placed on **AM_5 layer**.
  - ❖ Dimensions adjust to current drawing scale.



Create dimension types using Power Dimension

- ✓ Create Multiple dimensions
  - ❖ Parallel Dimensions
  - ❖ Ordinate Dimensions
  - ❖ Symmetrical dimensions





Demo

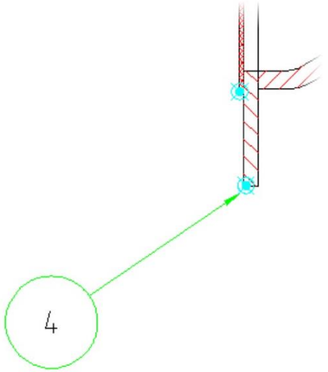
Stage D

CREATE SMART ANNOTATIONS

Smart balloons – Annotating with Balloons

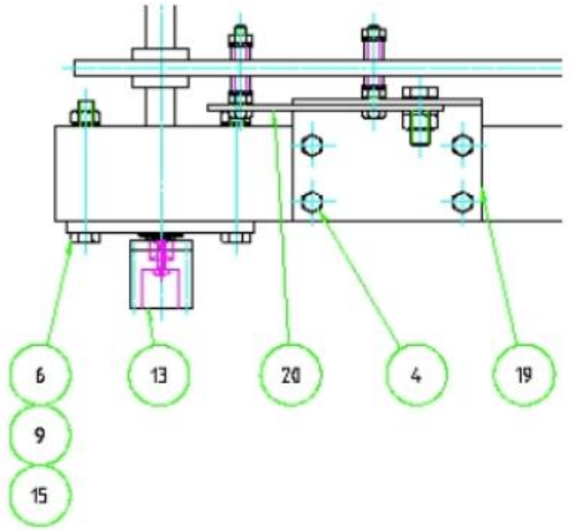
- ✓ Access Balloons under : Annotate tab > Balloon Panel.
  - ❖ Command line : **AMBALLOON**

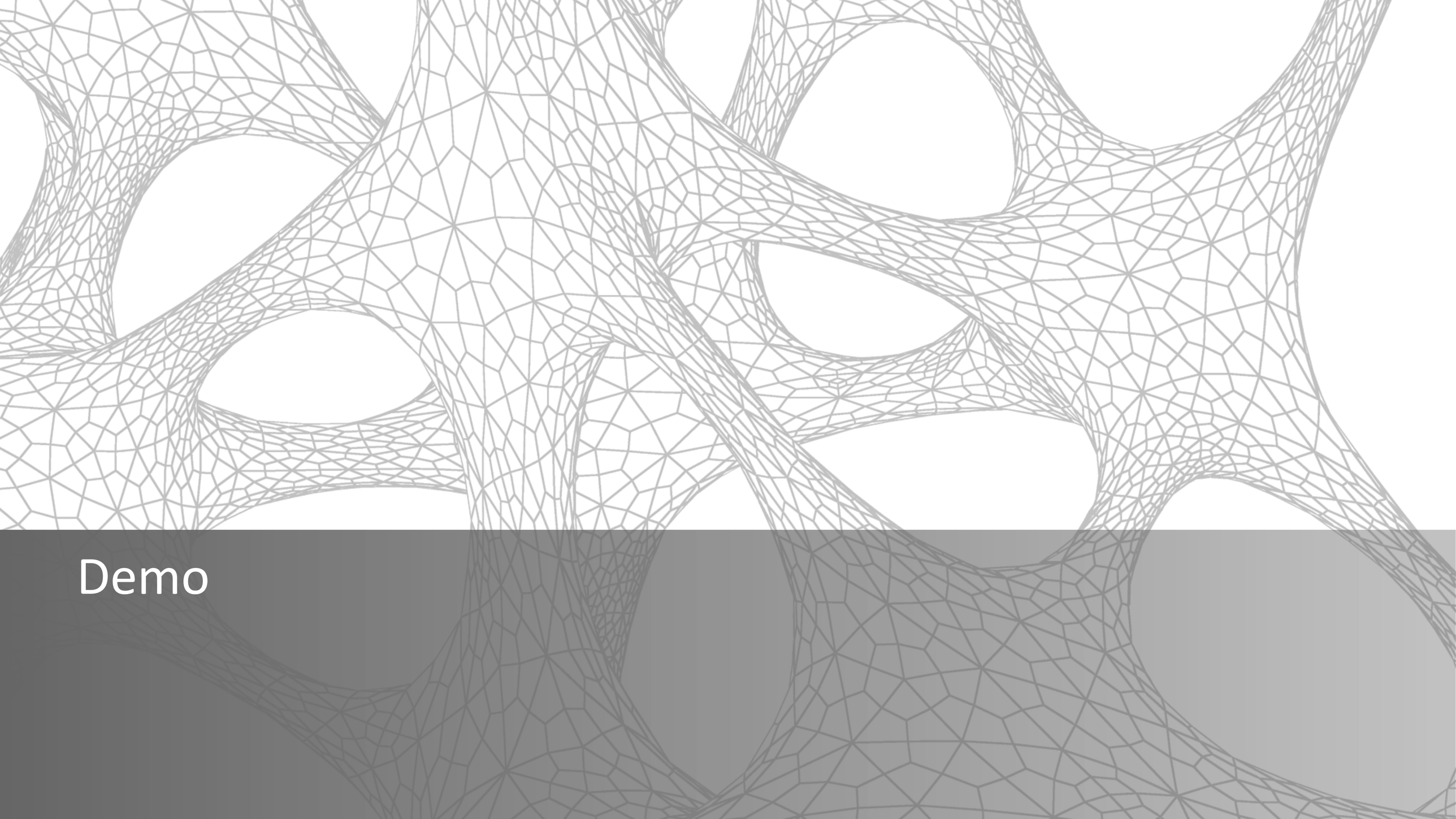
- ✓ *Benefits of Balloons :*
  - ❖ Easy placing > Select Part reference to add a Balloon.
  - ❖ Automatically linked with current BOM.
  - ❖ BOM associated to annotation view is automatically set to active.
  - ❖ An override to settings helps to create a unique notation.



Smart balloons - Simplifies Annotating

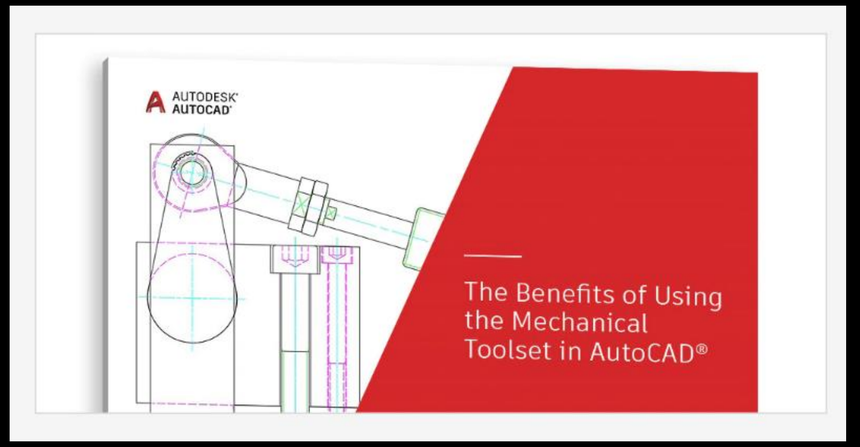
- ✓ Organizing Balloons in drawing :
  - ❖ Annotate tab > Balloon Panel > Reorganize Balloons
  - ❖ Can arrange balloons horizontally, vertically, at an angle or around an object
  - ❖ Change appearance and shape of balloon
  - ❖ Balloon follows standardization defined in **AM: Standards tab**



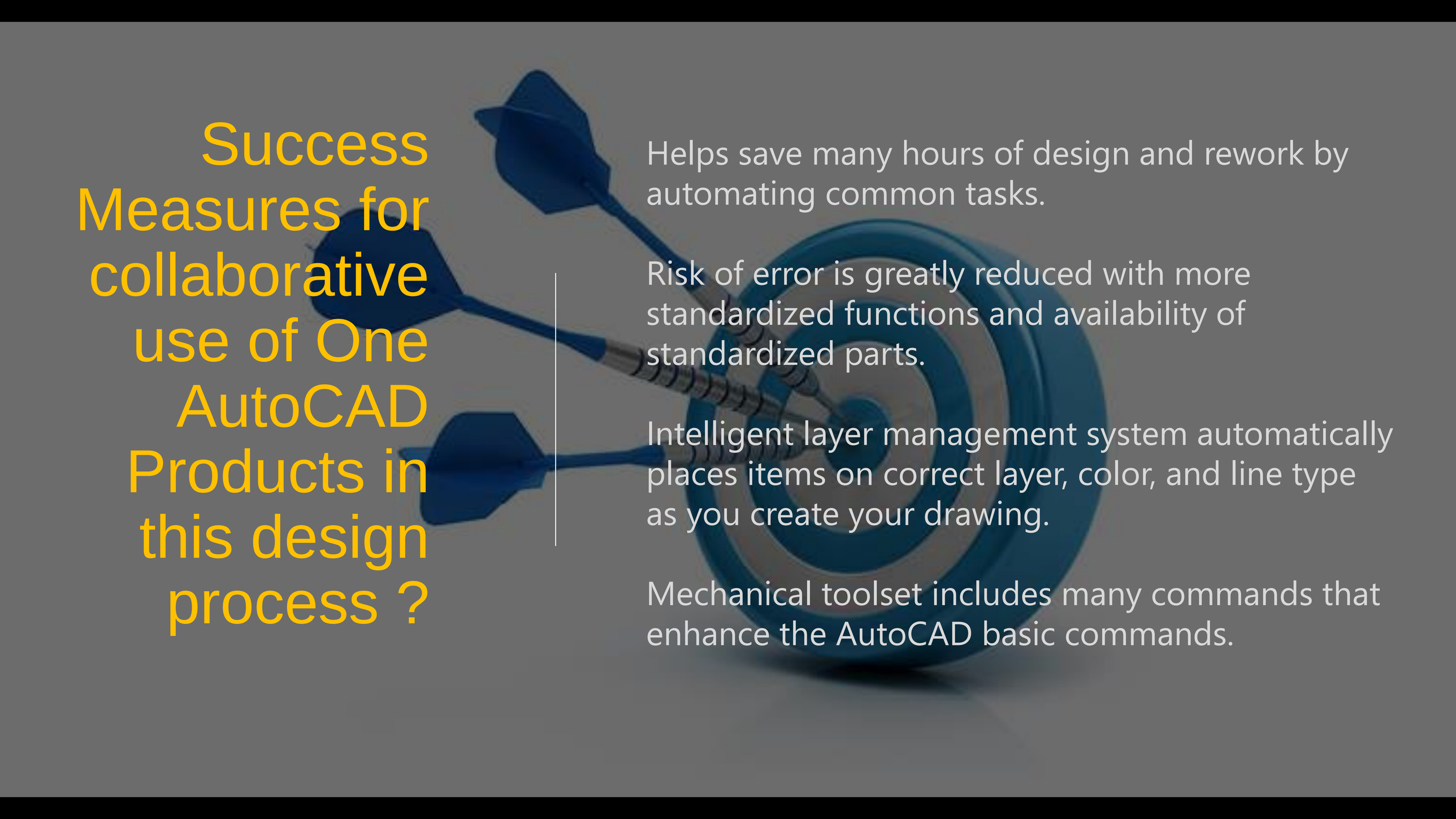


Demo

Success Measures for moving to Mechanical toolset for your design process ?



Success Measures for collaborative use of One AutoCAD Products in this design process ?



Helps save many hours of design and rework by automating common tasks.

Risk of error is greatly reduced with more standardized functions and availability of standardized parts.

Intelligent layer management system automatically places items on correct layer, color, and line type as you create your drawing.

Mechanical toolset includes many commands that enhance the AutoCAD basic commands.

Success Measures for collaborative use of One AutoCAD Products in this design process ?

Design a new robot tray clamp	AutoCAD	Mechanical Toolset
Prepare existing data	08:25	06:45
Create new concept	12:35	05:25
Structure data	03:30	01:20
Time savings with the Mechanical toolset		**45%**

(Figures shown in minutes)

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