VACUUM FIXTURE PLATE

General Purpose Vacuum Fixturing System

User Manual

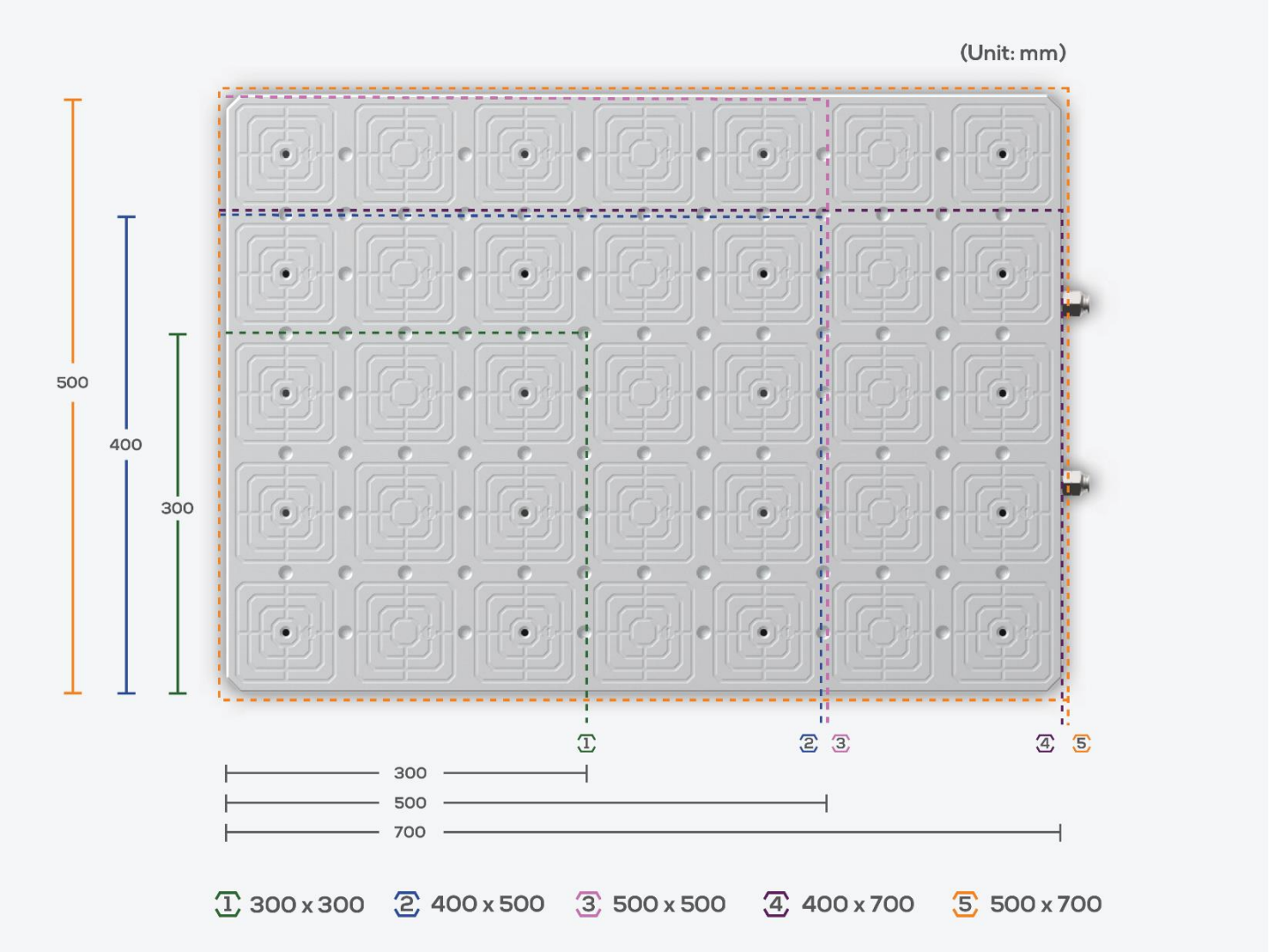

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Table of Contents

Vacuum Fixture Plate Overview

The DEVELOP Vacuum Fixture Plate is the core of the DEVELOP Workholding system. The DEVELOP Vacuum Fixture Plate maintains a vacuum fixturing pattern on an 85mm square distribution grid while incorporating precision locating bores and a conical locating feature on a standard 100mm grid. These combined features allow your team to design and utilize flexible fixturing commonly found with a fixture plate while maintaining the vacuum surface.

Included Hardware

A. 1 - Vacuum Table Assembly

A. (Quantity Based on Assembly) - Mounting Hardware
B. (Quantity Based on Assembly) - Vacuum Seals
C. 4 - Stainless Steel Conical Locators
D. 1 – Tube of Anti-seize Thread Lubricant*
E. 1 – DEVELOP Vacuum Tool**

* One included per order. If multiple plates are ordered at the same time only one package will contain anti-seize
** The files for 3D printing additional Vacuum Tools can be supplied if yours becomes damaged or lost.

1. Installation

1.1 Preparation

Before installing the DEVELOP Vacuum Table some preparation must be done. Ensure the following has been completed before placing the Vacuum Table in the machine.

1. The table must be cleared of all fixtures and any adapter installed.
2. Check that all the vacuum seals are in the top surface of the plate. The seals fit snugly into the drafted bores on the top surface of the plate.

1.2 Notes on Placement and Fastening

- ∉ **Due to the size of the Vacuum Table, we recommend a two-man lift when placing the Vacuum Table in the machine.**
- When fastening the Vacuum Table using the included hardware it is recommended to torque the screws to the torque values recommended in the table on the following page.
- Anti-seize is recommended to prevent galvanic corrosion or galling of the stainless-steel hardware.
- After the table has been fastened in place the Vacuum Table must be faced to match your machine. This process is detailed on page 5

Fastener	**Torque Specification**
M6 / 1/4-20	6 Nm
M8 / 5/16-18	15 Nm
M10 / 3/8-16	30 Nm

2. In Situ Facing

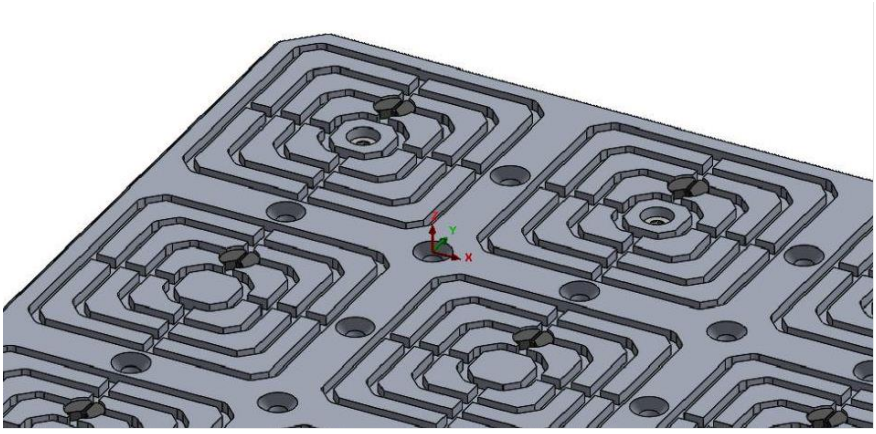
2.1 Why Facing is Needed

It is necessary to face the top of the Vacuum Table to match the working surface to your machine's level and to eliminate the tolerances used during manufacturing. During manufacturing, we control the parallelism tolerance of the upper plate to within .1MM or .003937 inches. This tolerance is chosen knowing that the Vacuum Table's working surface must be machined in situ to provide a perfect match to your machine's level. The parallelism tolerance of the lower plate has no impact on the conical locator's Z position, so we do not provide tolerances for its parallelism. The tolerance of the upper plate is allowed in the chamfers, bores, and vacuum grids on the working surface of the plate.

2.2 Process for Facing

Our recommended process for facing your Vacuum Table is identical across all machines.

1. In your CAD/CAM program of choice import the .step file we provide on the product page for your Vacuum Table.
2. Set the X&Y Origin of the WCS to the locating bore position indicated in the image below, with the Z Origin set at the top surface of the Vacuum Table.



3. Program a facing pass .01MM below the top surface of the Vacuum Table. For this operation, we recommend Datron stepped-single flute tools with a stepover of 60%-70% of the tool diameter. Note that if your program extends too far past the plate in any dimension it may cause your machine to overtravel.
4. Fasten one of the included conicals into the locator that corresponds to your WCS and probe it for X&Y location and the top surface of the Vacuum Table for Z.
5. Before executing your program, it is important to turn on the vacuum pump and ensure that a good seal is being created by the vacuum seals. The pump should remain on during the facing process.
6. Execute your program, watching for the entire working surface of the Vacuum Table to clean up. Alter your program to machine deeper in .01MM increments until the entire working surface of the Vacuum Table has been machined.
7. Once the entire working surface of the Vacuum Table has been machined you can disable the vacuum pump and begin using your Develop Vacuum Fixture System.

2.2 General Care

Proper care of your AFS FIXTURING components will ensure a long and productive service life.

Anti-Seize: All products are supplied with appropriate fasteners, but these fasteners do not come pre-applied with thread anti-seize. Use of anti-seize is recommended for all components threading into aluminum. This lubricates the threads which increases the mechanical advantage of the fasteners while also reducing the risk of galling the threads.

Hex Keys: We recommend the use of properly fitting hex keys. This reduces the wear imparted on screws and extends their lifespan. Should the hex of any fastener become damaged it should be replaced promptly.

Alignment Bores: The alignment bores featured on AFS products are precision machined surfaces and should be cleaned and inspected regularly. The most convenient opportunity to inspect and clean these features for defects or damage is when assembling components together.

Cleaning: It is recommended to clean your plates to maintain repeatability and ease of use. For this process we like to use a microfiber and some car spray wax. This helps repel dirt and to maintain a quality tool for years to come.