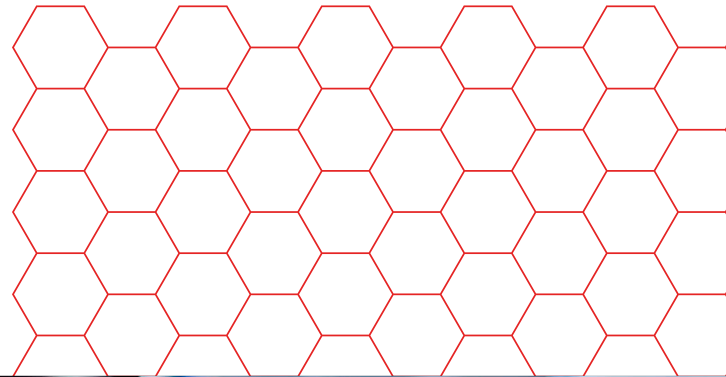




Ultimaker checklist

How to successfully introduce 3D printing to your business



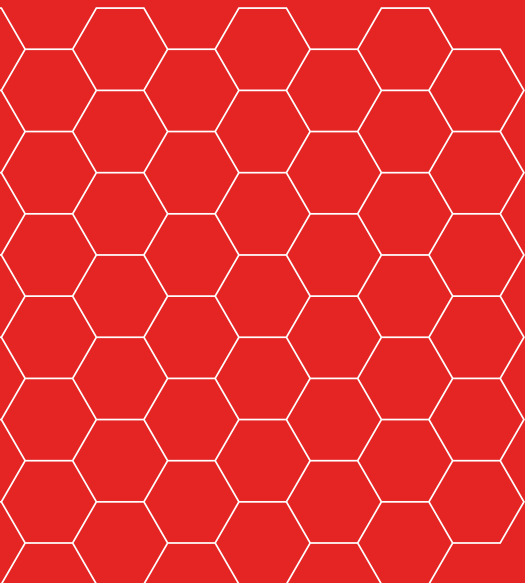
Ultimaker

How to successfully introduce 3D printing to your business



Contents

Introduction	3
Convincing stakeholders	4
Select a 3D printer	5
Education and staffing	6
Software	7
Materials	8
Facilities	9
Maintenance	10
Explore more 3D printing knowledge	10



Introduction

Fused filament fabrication (FFF) 3D printing enables you to optimize product development and reduce costs. It can also add value in applications such as mold creation, tooling, and one-off or low-volume end-use parts, like customized jigs and fixtures.

That's why organizations in industries as diverse as [automotive engineering](#) and [movie special effects](#) have already made the transition to 3D printing.

By embracing FFF 3D printing you will benefit from:

- Faster prototyping cycles
- An uninterrupted design process, with reduced lead times
- Improved product quality, by evaluating more design iterations
- Faster ROI and cost savings than outsourcing

This guide has been developed by Ultimaker's team of 3D printing experts, and will provide you with a road map for introducing FFF 3D printing to your business. Each section contains a checklist, detailing the tasks you need to complete to successfully introduce 3D printing to your business.



Convincing stakeholders

Integrating 3D printing into an existing work environment requires internal communication and collaboration. So your first step should be to get all stakeholders on board, from the top down.

Get the management team on board

Write an action plan detailing how you will use the technology, and the benefits that 3D printing offers in the following areas:

- **Return on investment:** Compare your current manufacturing costs with FFF 3D printing
- **Lead time:** Compare typical 3D printing and post-processing times, with the process you currently use
- **Design cycles:** Estimate how many more iterations you can introduce per design cycle, or how you can reduce overall development time
- **Cost:** Outline the cost of the 3D printer(s) you will buy, including setup and running costs

Involve colleagues from the start

Arrange demonstrations and meetings to explain the benefits of 3D printing
Establish a task force of employees familiar with, and enthusiastic about, 3D printing, to champion its advantages.



Talk to colleagues and build a compelling business case for 3D printing

Select a 3D printer

There are many 3D printers on the market, so selecting the best one for your business can be challenging. You may even benefit from investing in more than one 3D printing technology, especially if you have varied production requirements. To streamline your 3D printer selection, you should:

Define your 3D printer requirements. Ultimaker offers a [step-by-step guide](#) to help you do so.

Determine the number of printers needed

Request information from suppliers

Create a shortlist of 3D printers

Request quotes

Make a final choice

Choose the required number of printers

A 3D printer can execute just one task at a time, but this can include multiple parts within a single print job. Analyze your capacity requirements to determine whether you need one or more 3D printers. Consider the following factors:

- **Current production volumes:** This indicates the 3D print volumes you can expect. You can then determine how much time your 3D printing will require, and whether you will need multiple printers
- **Preparation time:** While in-house 3D printing reduces the time needed to create a part, the engineer's work may increase slightly. For example, preparatory work – such as modeling and system setup – will no longer be outsourced
- **Print time:** FFF print times vary, depending on part size and detail. You can [download Ultimaker Cura](#) software for free and use its print time estimate to establish how long a typical print would take
- **Post-processing and finishing time:** Research the types of post-processing your prints will require and how long they take.

Education and staffing

3D printing frees designers from many traditional design constraints, and introduces new rules for successful product design. This approach involves designing for additive manufacturing (DfAM), which may necessitate additional staff training.

Arrange onboarding training: Introduce staff to FFF 3D printing to reduce initial print errors and accelerate setup. Your supplier should be able to provide this training

Offer advanced design training: Research online training courses and manuals that familiarize designers with 3D printing design requirements. At Ultimaker.com you'll find several documents highlighting [design best practices](#), and [manuals for Ultimaker Cura](#) slicing software

Find expert help: Find an online community that can serve as a source of information

Identify skills gaps: Conduct a skills and resources audit, to identify whether additional resources are needed



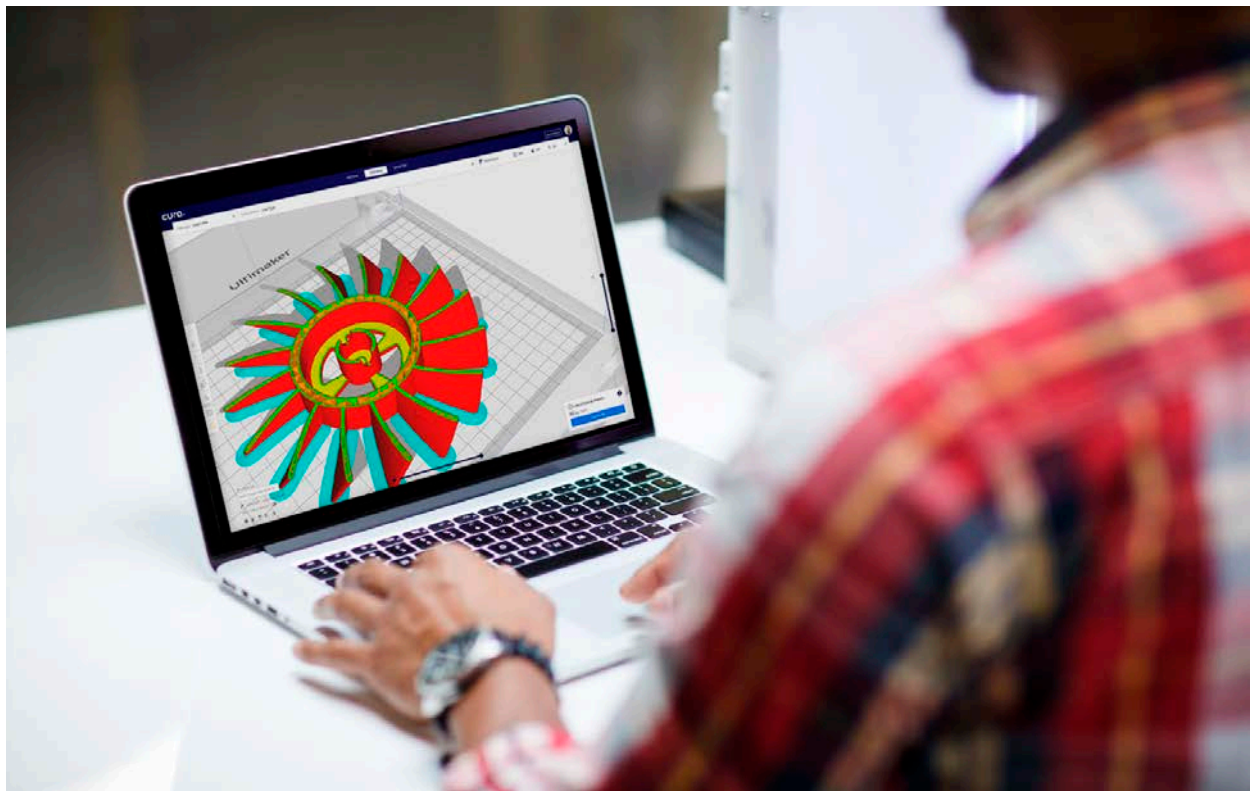
Understanding how to design for 3D printing will ensure quality results

Software

3D modeling software is a prerequisite for 3D printing. Your modeling software should be capable of producing file types that are compatible with 3D slicing software such as Ultimaker Cura. This simplifies the software integration process.

Check software compatibility: Ensure that your design software produces files that are compatible with your slicing software

Conduct an IT audit: List all of the computers on which the slicing software will be installed. Is the slicing software compatible? Do systems need to be updated?



Ultimaker Cura runs on Windows, MacOS, and Linux, and works with all major 3D model file types

Materials

FFF 3D printing uses a wide range of thermoplastics and composite materials, called filaments. These range from cost-effective options ideal for prototyping, to engineering-grade materials that replicate product properties in prototypes or make strong end-use parts.

Analyze your material needs: What are the aesthetic or mechanical properties your prints need, and which materials can provide these?

Check your 3D printer compatibility: Is your chosen printer compatible with these materials?

Consider material suppliers: Choose a printer with an open filament system, so you can use materials from diverse suppliers.



Facilities

When bringing 3D printing in-house, consider the physical work environment and facilities.

Decide where to place the 3D printer(s). Should they be on users' desks or in a central space?

Will multiple printers be connected to a network? This enables a continuous production workflow, as jobs are automatically scheduled and delegated

Are there sufficient electrical outlets? Check the printer's specifications for power supply requirements

Decide how print jobs will be started and monitored. This depends on whether they will be connected to a network

Are air quality and ventilation adequate? Some materials produce fumes when heated, which can build up to levels that exceed safety standards. Check the material's data sheet for instructions and add an air filtration accessory if necessary

Ensure easy access to post-processing facilities e.g. water for dissolving soluble support material, and space to work with tools

Check if damping or insulation is required to prevent noise pollution, and that vibrations will not affect the printers

Make sure there is storage space for filament and spare parts, and consider accessories that make storage easier

Maintenance

3D printers should be routinely maintained, to ensure optimum performance and lifespan. Your maintenance needs will depend on the printer you choose, and the type of maintenance contract that you sign.

Make a schedule for daily, weekly, and monthly maintenance. Determine how much time it will take, and the supplies needed

Establish how much maintenance you can do yourself, and what you will need to outsource

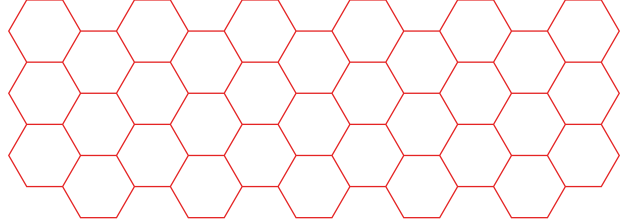
Sign a service contract, including repairs, preventative maintenance, and application support

With these basic preparations, you are able to make better purchase decisions and maximize your 3D printing success from day one.

Explore more 3D printing knowledge

Learn more from industry leaders and experts, or request a quote on the Ultimaker website.





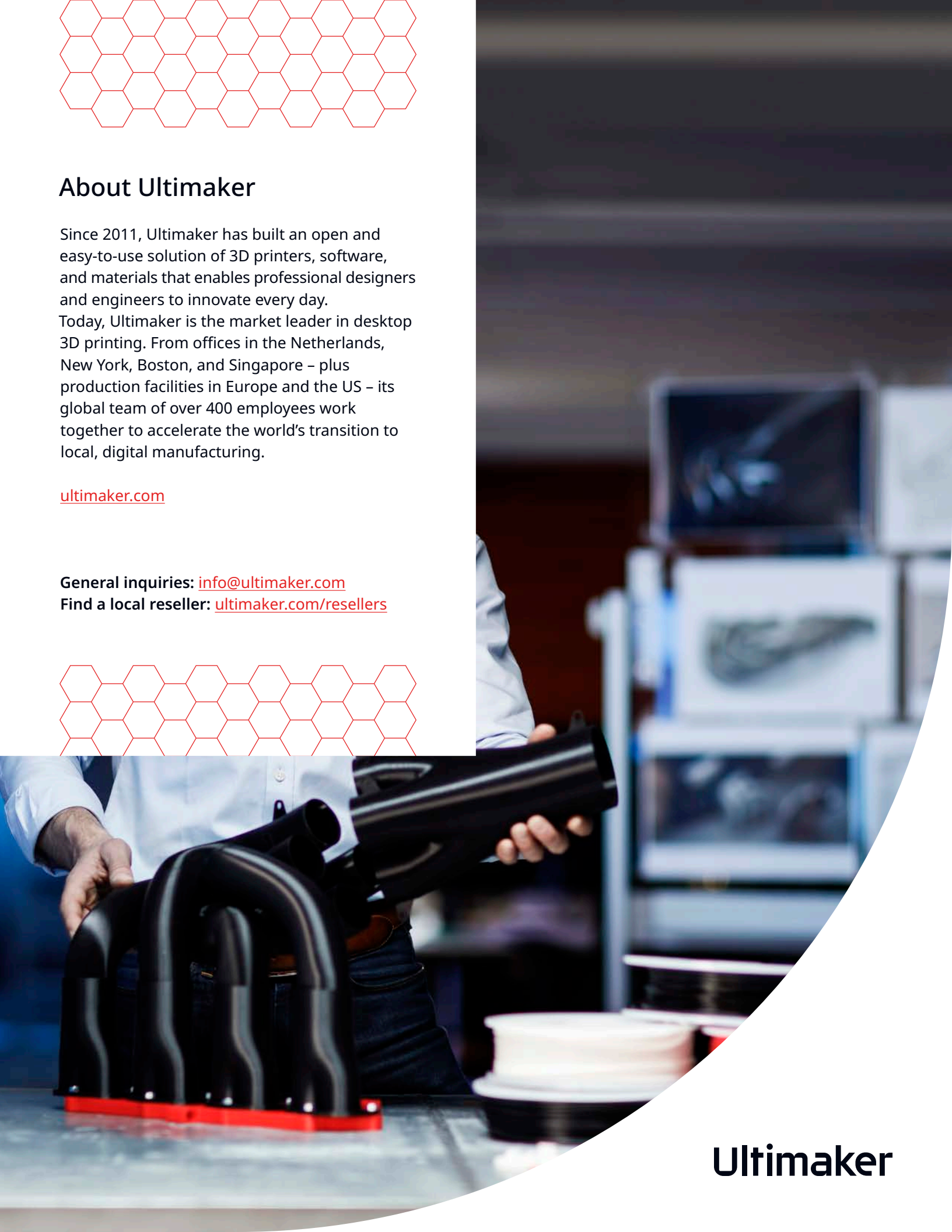
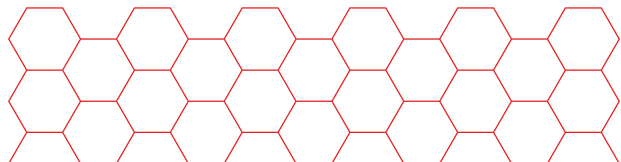
About Ultimaker

Since 2011, Ultimaker has built an open and easy-to-use solution of 3D printers, software, and materials that enables professional designers and engineers to innovate every day. Today, Ultimaker is the market leader in desktop 3D printing. From offices in the Netherlands, New York, Boston, and Singapore – plus production facilities in Europe and the US – its global team of over 400 employees work together to accelerate the world's transition to local, digital manufacturing.

ultimaker.com

General inquiries: info@ultimaker.com

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