GENERAL

arcam dv79 user guide

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Introduction

In the fast moving world of 3D printing, the **Arcam DV79** stands out as a versatile, high performance system that caters to both industrial and research environments. Whether you're a seasoned professional or a newcomer eager to explore the capabilities of this machine, a clear and comprehensive guide is essential for unlocking its full potential. This article serves as your **Arcam DV79 user guide**, offering step by step instructions, practical tips, and troubleshooting advice to help you navigate every aspect of the device—from initial setup to advanced operation and routine maintenance.

Overview of the Arcam DV79

The Arcam DV79 is a dual head, direct metal laser powder bed fusion machine designed for rapid prototyping and low volume production. Its key strengths include:

- Precision: Sub micron layer resolution delivers intricate geometries.
- Speed: Dual laser heads cut down build times by up to 50%.
- Versatility: Supports a wide range of metal powders, from titanium alloys to stainless steel.
- User friendly interface: Intuitive software streamlines workflow and reduces learning curves.

Understanding the hardware layout, control software, and typical workflows is the foundation of effective use. The following sections break down each component, ensuring you can confidently configure, operate, and maintain your Arcam DV79.

System Requirements

Before diving into installation, confirm that your environment meets the DV79's prerequisites:

- Operating System: Windows 10 Pro (64 bit) or newer, with the latest service packs.
- Hardware: Minimum 8 /GB RAM (16 /GB recommended), 500 /GB SSD for the host PC, and a dedicated graphics card for the control interface.
- Network: Gigabit Ethernet connection for data transfer and firmware updates.
- Power Supply: 400 /V AC mains, with a surge protector and uninterruptible power supply (UPS) for critical components.
- Safety: Class 2 laser safety eyewear, a laser rated enclosure, and an emergency stop button within reach.

Adhering to these specifications ensures reliable operation and minimizes the risk of hardware conflicts.

Installation Guide

Hardware Setup

1. **Unboxing and Placement**\n Carefully remove the DV79 from its packaging, check for visible damage, and place the machine on a stable, vibration free surface. Ensure the floor is level to avoid misalignment of the build platform.

2. **Power Connection**\n Connect the power cable to the machine's main power input and plug into the UPS. Verify

that all indicator lights turn on.

3. **Laser Safety**\n Install the laser safety enclosure and confirm the interlock system is functioning. Place the laser safety eyewear in the designated holder.

4. **Environmental Controls**\n The DV79 requires a temperature range of 18–24 °C and humidity below 60 %. Use a climate control system if your facility does not naturally meet these conditions.

5. **Material Handling**\n Load the powder hopper with the selected metal powder. The machine's powder handling system will automatically distribute the material to the build chamber.

Software Installation

1. **Download the Software Suite**\n Visit the official Arcam website and locate the latest version of the Arcam DV79 software package. Download the installer to your host PC.

2. **Run the Installer**\n Execute the installer, accept the license agreement, and follow the on screen prompts. Choose the default installation path unless you have a specific requirement.

3. **License Activation**\n Open the Arcam Control Center and enter your license key. If you have a network license, ensure the license server is reachable.

4. **Connect to the Machine**\n In the Control Center, navigate to *Device Settings*and select the DV79 from the list of available devices. The software should automatically detect the machine and establish communication.

5. **Update Firmware**\n Check for firmware updates via the *System Update*tab. If an update is available, follow the prompts to flash the new firmware onto the machine. This step guarantees that you have the latest features and bug fixes.

Initial Configuration

User Interface Overview

The Arcam Control Center is divided into several panels: **Project Manager**, **Build Settings**, **Laser Controls**, and **Diagnostics**. Familiarizing yourself with these sections will streamline your workflow.

Project Manager is where you import CAD files, generate build jobs, and track status. The **Build Settings** panel allows you to fine tune laser power, scan speed, and hatch spacing**Laser Controls** provide real time monitoring of laser output, while **Diagnostics** offers system health checks and error logs.

Setting up Profiles

Creating material and process profiles reduces repetitive configuration steps. To set up a new profile:

1. Navigate to Profiles in the main menu.
2. Click Add New Profile and name it according to the material (e.g., "Ti 6Al 4V").
3. Enter the default laser power, scan speed, and hatch distance for that material. You can base these values on manufacturer recommendations or your own calibration data.
4. Save the profile and assign it to a new build job during the Build Settings phase.

By using profiles, you minimize setup time and maintain consistency across multiple builds.

Operating the DV79

Basic Operations

Once your build job is loaded and the machine is ready, follow these steps to commence printing:

1. Pre Build Check: In the Diagnostics panel, run a quick system check to confirm that all sensors, lasers, and powder feeders are functioning.
2. Build Chamber Preparation: Ensure the chamber is clean and the powder bed is level. The DV79's auto leveling feature will perform a quick scan to adjust the platform if necessary.
3. Start Print: Click Start in the Control Center. The machine will begin the laser scan, layer by layer, while the software monitors temperature, laser power, and powder usage.
4. Monitoring: Keep an eye on the real time metrics. If the temperature deviates from the setpoint, the machine will pause automatically to prevent warping.
5. Completion: Once the final layer is finished, the machine will cool the part to the target temperature before unlocking the build platform.

These steps provide a streamlined workflow for routine builds. For more complex jobs, proceed to the advanced features section.

Advanced Features

The Arcam DV79 offers several advanced capabilities that can enhance part quality and production efficiency:

- Dual Laser Synchronization: The two laser heads can operate independently or in tandem. Use the Dual Laser Mode to split a build between heads, effectively doubling throughput.
- In Process Inspection: The machine's built in camera captures images after each layer. Compare these images against the CAD model to detect defects early.
- Adaptive Scanning: The software can adjust laser parameters on the fly based on real time temperature data, improving dimensional accuracy.
- Powder Recycling: Unused powder can be automatically collected and re introduced into the hopper, reducing material waste.

Leveraging these features requires additional configuration, which is covered in the next section.

Troubleshooting Common Issues

Connectivity Problems

Connectivity issues often stem from network configuration or cable problems. To resolve them:

1. Verify that the Ethernet cable is securely connected to both the DV79 and the host PC.
2. Check the IP address assigned to the machine via the Network Settings panel.
3. Ping the machine from the host PC to confirm communication. If the ping fails, restart the networking hardware.
4. Ensure that firewall settings allow traffic on the DV79's default ports (TCP 5000–5005).

Persistent problems may require a firmware rollback or contacting Arcam support.

Firmware Updates

Firmware updates can sometimes introduce bugs. If you encounter unexpected behavior after an update:

- Reboot the machine and verify that the firmware version matches the one advertised on the software.
- Run the diagnostics to check for error codes.
- Consult the release notes for known issues.
- If necessary, perform a firmware downgrade using the Firmware Manager tool.

Always back up your configuration before applying updates.

Maintenance & Best Practices

Routine Checks

Maintaining the Arcam DV79's components ensures longevity and reliability:

1. Inspect the laser mirrors and lenses every month for dust accumulation. Clean with a microfiber cloth and lens cleaning solution.
2. Check the powder feed rollers for wear and replace them after 200 build hours.
3. Verify the cooling system's water flow and replace filters quarterly.
4. Run a diagnostic scan after each month of inactivity to catch any hidden issues.

Data Backup

Data integrity is crucial for traceability and compliance. Implement the following backup strategy:

- Export build logs and part data to a secure cloud storage platform daily.
- Maintain an on site backup on an external hard drive, updated weekly.
- Use version control for CAD files and build settings to track changes.
- Store firmware backups in a separate location to facilitate recovery.

Regular backups protect against data loss and streamline recovery after system failures.

FAQ

- How do I calibrate the laser power?\nUse the Laser Calibration tool in the Control Center. The software will guide you through a series of test scans, adjusting the power until the target energy density is achieved.
- What is the recommended powder flow rate?\nFor titanium alloys, a flow rate of 0.5 /g/min is typical. Adjust based on part geometry and desired build speed.
- Can the DV79 be used with composite powders?\nYes, but ensure the composite is certified for laser powder bed fusion and follow the manufacturer's guidelines for laser settings.
- Is there a way to automate the build process?\nIntegrate the DV79 with an ERP system using the Arcam API. This allows job scheduling, inventory tracking, and status reporting.

Conclusion

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