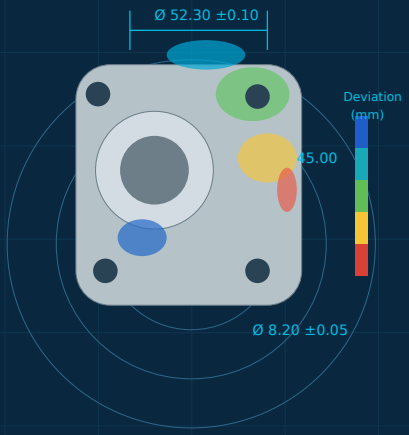
Industrial Additive Manufacturing



For R&D, Production and Low-Volume Supply

Prototypes - Tooling - Enclosures - Reverse Engineering - Geometry Verification - Repeat Parts

Dror Additive Manufacturing helps industrial companies produce engineering parts quickly, verify their geometry, and move from a first sample to repeat low-volume production.

1 Fast

Prototypes, test parts, tooling, urgent replacements and engineering iterations.

2 Repeatable

Approved parts, fixed setup, batch production and repeat orders.

3 Verifiable

Critical dimensions, dimensional checks and scan-to-CAD comparison.

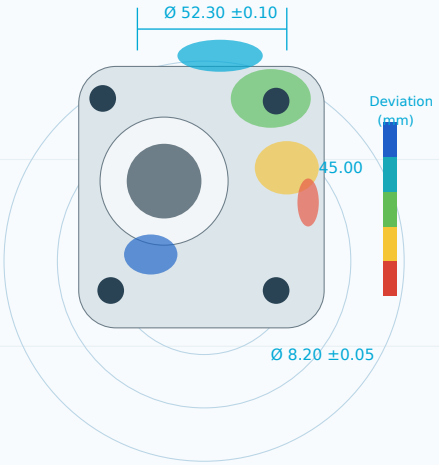
Manufacture. Verify. Repeat.

We do not offer just 3D printing. We offer a managed workflow: understand the application, choose the right process and material, produce the first article, verify fit and critical dimensions, fix the production setup, and repeat approved batches.

Where we help

- R&D teams
- Production engineering
- QA / metrology
- Procurement / supply chain
- Hardware product teams
- Production suppliers
- Electronics, robotics, UAV, sensors, medical devices and industrial equipment

Where We Help Manufacturers



We work in the gap between one-off prototyping and costly mass production. Additive manufacturing is most effective when speed, flexibility, low volumes or frequent design changes matter.

1 Typical Production Situations

Situation	How Dror Additive Manufacturing Helps
A new design must be checked quickly	Rapid prototype, form-fit part, mockup or test assembly before expensive production starts.
A small batch is needed	Low-volume production without tooling investment or a long launch process.
The part changes between revisions	Fast model updates and quick remanufacture of the new revision.
No drawing, only a physical part	Reverse engineering, 3D model reconstruction and geometry recovery.
Fit and geometry must be verified	First article, dimensional check and optional scan-to-CAD verification.
Production needs custom aids	Jigs, fixtures, holders, trays, templates and test adapters.
A backup supplier is needed	Pilot part qualification and repeat low-volume supply.

2 A Good Way to Start

The most effective first project is one safe, repeatable part that already creates friction in the customer workflow.

Good Starter Parts
cover / cap | bracket | holder | cable guide | adapter
sensor mount | inspection fixture | assembly jig | test housing | packaging insert

What usually makes a part suitable

- low to medium quantities
- frequent revisions
- urgent lead time
- complex geometry
- non-critical polymer component
- tooling, fixture or production aid

What We Manufacture

We support engineering, production and low-volume supply with additive manufacturing parts that are practical, testable and repeatable.

1. Prototypes and R&D Parts

Part Type	Purpose
Functional prototype	Check function, mechanics, fasteners and assembly before release.
Form-fit test part	Check geometry, mounting points, openings and clearances.
Engineering mockup	Evaluate packaging, ergonomics and access to components.
Prototype housing	Temporary enclosure for electronics, sensors, PCBs or modules.
Proof-of-concept assembly	Quick validation of a concept or subassembly.

2. Production Tooling

Part Type	Purpose
Assembly jig	Hold parts in a repeatable position during assembly.
Inspection fixture	Support the part during measurement and quality checks.
Positioning guide	Repeatable positioning of holes, fasteners or components.
Calibration holder	Hold sensors, cameras, boards or modules during setup.
Test adapter	Support or interface a part on a test stand.
Custom tray	Trays, separators and holders for production or inspection.

3. Enclosures, Covers and Mounts

Part Type	Purpose
Electronic enclosure	Housing for a PCB, controller, sensor or module.
Sensor mount	Mount for a sensor or measuring unit.
Camera bracket	Bracket for a camera or optical module.
Antenna housing	Housing or fairing for an antenna.
Cable guide	Routing and organizing cables or wiring.
Battery tray	Tray or holder for a battery pack.
Protective cover	Cover, cap or protective shield.
Adapter / duct	Adapter, duct or transition geometry.

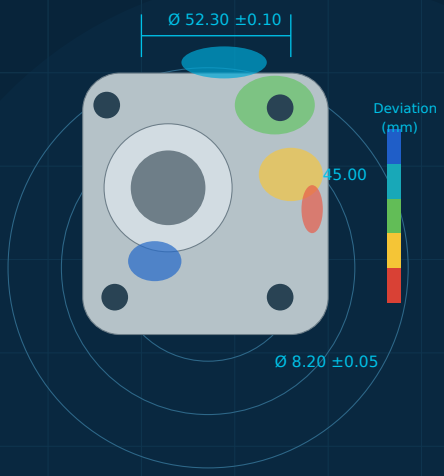
4. Repeat Low-Volume Parts

- recurring polymer component
- pilot batch
- pre-production part
- replacement part
- customized component

Best fit for this service

The strongest candidates are parts that need speed, flexibility, low to medium quantities, frequent revision changes, or a practical route from first article to repeat batch production.

How We Enter the Supply Chain



The goal is not one-off printing. The goal is an approved, repeatable part that can move from first sample to repeat low-volume supply.

1 From a First Part to Repeat Supply

Step	Action	Result
1	Select one non-critical part	A clear pilot task
2	Receive CAD, STEP, STL, drawing or physical sample	Usable input data
3	Clarify the application	Understanding of environment, load and constraints
4	Choose process and material	Preliminary specification
5	Produce the first article	First physical part
6	Check fit and critical dimensions	Fit test / dimensional validation
7	Adjust the model or process if needed	Corrected revision
8	Approve Rev A	Frozen part definition
9	Quote 10 / 25 / 50 / 100 batch quantities	Clear batch price and lead time
10	Fix the production setup	Repeatability
11	Produce repeat batches	Entry into the supply chain

2 What gets fixed for a repeatable part

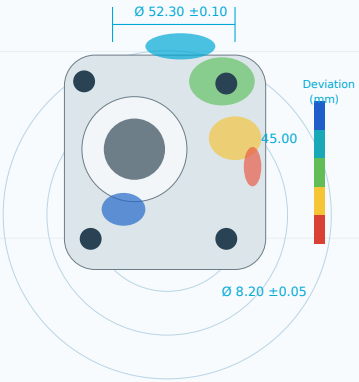
Parameter	What is Fixed
Part revision	Version, file, date and approved changes
Material	Material type, supplier, color and batch
Print process	Technology, orientation, layer strategy and infill
Post-processing	Support removal, washing, curing, finishing or machining
Critical dimensions	Dimensions that must be checked
Inspection level	Basic, dimensional or scan-to-CAD
Packaging	Protection, labeling and packing method
Reorder rule	How the part is reordered without restarting from zero

Pilot Part Instead of a Generic Pitch

The fastest path to real work is to start with one part that already causes friction - a cover, bracket, holder, adapter, fixture or production aid. After a successful first article, the same workflow can scale to repeat batches.

Verifiable Manufacturing

For industrial customers, receiving a part is not enough. The geometry must be understandable, the critical dimensions must be controllable, and repeat batches must be based on a clear verification logic.



1 What we can verify

Controlled Feature	Examples
Hole diameters	Mounting and fit holes
Center distances	Spacing between fastener locations
Mating planes	Contact surfaces with another part
Connector windows	USB openings, sensor windows, PCB connectors
Wall thickness	Enclosures, covers and shields
Locating surfaces	Brackets, holders and fixtures
Overall form	Comparison of a scanned part to the CAD model
Print deformation	Warping, shrinkage or geometry drift

2 Inspection Levels

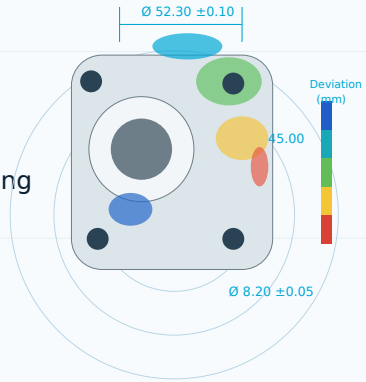
Level	What is Included	Typical Use
Basic control	Visual check, completeness and obvious defect screening	Simple mockups and non-critical tooling
Dimensional control	Check critical dimensions with measuring tools	Brackets, enclosures and fit-sensitive parts
Scan-to-CAD	3D scan, CAD comparison and deviation map	First article and complex geometry
Batch control	Sampling inspection of a repeat batch	Repeat low-volume orders
FAI logic	First article validation against defined requirements	Launch of a repeatable part

First article inspection confirms that a new or changed manufacturing process can produce a part that meets the drawing or specification requirements.

What the customer receives

- finished part or batch
- validated fit
- critical dimension list
- inspection report if required
- scan-to-CAD report if required
- approved revision reference
- a practical basis for repeat orders

Production Parameters



The values below are practical working ranges for preliminary engineering discussions. Final values depend on geometry, material, orientation, post-processing and the required inspection level.

1 Working Technologies

Technology	Typical Layer	Working Accuracy	Best Use	Limits
FDM / FFF	0.10-0.30 mm	typically ±0.20-0.50 mm	Large parts, tooling, brackets, enclosures, holders and templates	Visible layers, anisotropy, orientation-dependent strength
SLA / MSLA	0.03-0.10 mm	typically ±0.05-0.20 mm	Small accurate parts, master models, housings and visual models	Some resins are brittle, UV aging, size limits
SLS	0.10-0.12 mm	typically ±0.20-0.40 mm	Functional PA12 parts, small series and complex geometry without supports	Rougher surface, shrinkage control, supplier quality matters

What Affects Accuracy

Factor	Effect
Part size	Larger parts accumulate more deviation risk.
Geometry	Thin walls, long planes and holes require attention.
Build orientation	Affects strength, surface quality and dimensions.
Material	Different shrinkage, stiffness, flexibility and moisture sensitivity.
Post-processing	Washing, curing, sanding and support removal change the surface.
Critical dimensions	Must be defined before the first article is produced.
Repeatability	Requires a fixed production setup.

Typical Batch Sizes

Batch Size	Typical Use
1-3 pcs	First article, concept check, R&D
5-10 pcs	Test assembly, pilot run
25-50 pcs	Low-volume production support
100+ pcs	Repeat batch where the process is suitable
500+ pcs	Only after an economic review versus alternative methods

Engineering Note

No blanket accuracy claim is valid for every part. For critical or repeatable parts, the correct process is to build the first article, verify fit and critical dimensions, and then freeze the production setup for future batches.

FFF Filament Materials

Creality and similar commercial filaments are practical engineering candidates for prototypes, tooling, housings, mounts, adapters, non-critical components and low-volume parts. For regulated uses, the material, process and inspection plan must be approved by the customer.

Commercial / engineering-grade positioning - not claimed as aerospace-approved materials

Material	Key Properties	Typical Print Conditions	Good For	Limits
PLA / Hyper PLA	Rigid, stable, easy to print, good geometry retention	Nozzle 190-230 C / Bed 45-60 C	Mockups, form-fit parts, simple fixtures, visual prototypes	Low heat resistance, brittle under impact, not for structural hot environments
PETG	Tougher and more ductile than PLA, better moisture resistance	Nozzle 220-250 C / Bed 70-85 C	Covers, housings, holders, cable guides, protective parts	Moderate stiffness; exact fit details still need validation
ABS	Impact resistant, better heat resistance than PLA or PETG	Nozzle 240-260 C / Bed 90-110 C	Technical housings, covers, functional prototypes	Shrinkage, odor, enclosure and temperature control are important
ASA	Similar to ABS, better UV and outdoor durability	Nozzle 240-270 C / Bed 90-110 C	Outdoor covers, external housings, weather-exposed parts	Shrinkage; requires stable printing conditions
TPU 95A	Flexible, rubber-like, damping behavior	Nozzle 210-240 C / Bed 40-60 C	Gaskets, soft inserts, dampers, protective elements	Not for rigid brackets or precision rigid fits
PA / PA-CF	Strong, wear resistant, stiffer with carbon fiber	Nozzle 260-300 C / Bed 80-110 C; drying required	Functional brackets, holders, adapters, low-volume functional parts	Moisture sensitive; drying required; CF grades need a wear-resistant nozzle

Safe positioning

Print conditions are typical working ranges. Final settings must be confirmed for the exact filament grade, printer, nozzle, chamber conditions and part geometry. These materials should not be described as aerospace-approved, medical-grade or fully compliant with customer-specific regulated requirements unless supporting documents are available.

Resin, Standards and Documentation

Resin materials are useful for highly detailed prototypes and geometry checks. Standards, however, are not the same thing as material approval.

SLA / MSLA - Elegoo 8K Resin and Similar Materials

Material	Key Properties	Typical Process	Good For	Limits
Standard 8K Resin	High detail, smooth surface, good visual accuracy	405 nm resin, 0.03-0.10 mm layers, wash and UV post-cure	Master models, small housings, accurate prototypes, form checks, fit tests	Not for impact-loaded parts, long-term load, outdoor use or high heat without testing
ABS-like / Tough Resin	Less brittle, higher impact toughness than standard resin	405 nm, controlled post-curing	Functional prototypes, housings, clips and test assemblies	Needs strength and aging validation for demanding use
High-Temperature Resin	Higher heat resistance	405 nm, strict post-curing	Thermal tests, tooling aids, heat-exposure trials	Not for permanent loaded use without validation

Standards Are Not the Same as Materials

Type	Example	Meaning	How it Relates Here
Quality system	AS9100	Quality management standard for aerospace, space and defense organizations	A filament or resin itself is not AS9100-certified
First article logic	AS9102	Validation of the first article against defined requirements	Useful as a workflow model for launching a repeatable part
Special process accreditation	Nadcap	Accreditation of certain aerospace and defense processes	Applies to processes and suppliers, not to a spool of filament
AM terminology	ISO/ASTM 52900	Terminology and classification for additive manufacturing	Useful for describing the process correctly
Material records	SDS / TDS / CoC / CoA	Documents that describe and trace the material	These are the documents to request from the supplier

Certificates and Documentation Position

Document / claim	Status
Material TDS / SDS	Provided when available from material supplier
Lot / batch record	Can be recorded per order
CoC / CoA	Only if issued by material supplier

What we do not claim

- certified aerospace production
- flight-critical part manufacturing
- medical implant manufacturing
- automatic compliance with AS9100 / Nadcap / customer specifications

What we can support

- first article
- material traceability
- fixed production setup
- dimensional inspection
- scan-to-CAD
- batch documentation

Material Suitability and Getting a Quote

The best first project is a part that is practical, easy to validate and useful to the customer's real workflow.

1 Material Suitability Matrix

Part Type	PLA	PETG	ABS / ASA	TPU	PA / PA-CF	Standard 8K Resin
Visual prototype	Good	Good	Good	Limited	Good	Excellent
Form-fit check	Good	Good	Good	Limited	Good	Excellent
Assembly jig	Good	Good	Good	Rarely	Excellent	Limited
Inspection fixture	Good	Good	Good	Rarely	Good	Good
Electronics enclosure	Limited	Good	Good	Rarely	Good	Good for small housings
Sensor / camera mount	Limited	Good	Good	Rarely	Excellent	After testing
Cable guide	Good	Good	Good	Good	Good	Limited
Flexible insert / damper	No	No	No	Excellent	No	No
Outdoor cover	Poor	Fair	Good, especially ASA	Fair	Good	Poor without protection
Functional bracket	Limited	Fair	Good	No	Excellent	Usually no

2 What to Send Us

Input	Why It Matters
CAD file: STEP / STL / 3MF	Defines the geometry
Drawing with tolerances	Needed when dimensions are critical
Quantity	Batch size drives cost and method
Application	Helps choose the right material
Operating conditions	Temperature, moisture, load, chemicals, indoor or outdoor use
Surface requirements	Visual or technical finish expectations
Critical dimensions	Tells us what must be checked
Required report level	Basic, dimensional or scan-to-CAD
Lead time	Urgency influences planning and price

What You Receive

- manufacturability feedback
- recommended process and material
- first article quotation
- batch quotation
- proposed lead time
- inspection proposal
- repeat order option

Start with One Part

Send one practical part. We will evaluate manufacturability, material options, first article cost and repeat batch potential.

Dror Additive Manufacturing

Prototypes, tooling, enclosures, reverse engineering and repeat low-volume polymer parts.

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