

Checklist

Debinding & Sintering

The following list is there to help you increase the success rate of your parts during debinding and sintering (D&S).

- Does the green part meet the **maximum size recommendations** given in the User Guideline?
- Was the green part **scaled** according to the User Guideline?
- Does the recommended **height-to-width ratio** apply to the component?
- If the green part has unsupported walls, do the part follow the recommended **unsupported walls height-to-width ratio**?
- Has the extrusion flow been calibrated to ensure that **all extruded lines** (e.g. outlines) are **properly connected**?
- Is the **overlap between the infill and the outlines** over 20 % of the line width?
- Was grid or triangle used as **infill pattern** if printed with **less than 100 % infill**?
- Was the **bed adhesion helper** (e.g. **raft**) **removed** after printing?
- Is the **boxing volume** of the green part considered when preparing a **shrinkage plate (dense surface)** if necessary?
- Is the bottom surface of the green part completely **straightened** (e. g. **no warping** or **grooves**)?
- Is the surface of the green part finished (e.g. **no blobs** or **stringing** or **layer delamination** or **gaps between the extruded lines**)?

Checklist

Shipment

Below is a checklist to help you decide whether the green parts are packed in such a way that they will reach the D&S service provider safely.

- Are all green parts **packed individually**?
- Is each package **labelled clearly** and **distinctively**?
- Are green parts **wrapped** in a **packing material** (e.g. **bubble wrap** or **foam**)?
- Are green parts **fully covered** with packing material?
- Is a **filler** (e.g. **packing peanuts**) used for padding in the shipping box so the green parts cannot move freely?

Recommendations

Packaging & Shipment

The success of D&S depends to a large extent on keeping green parts free of damage during shipment to the D&S service provider.

The following are recommendations for the packaging and shipment preparation of green parts.

Individual and Safe Packaging

We strongly recommend packing the green parts individually. No matter what packaging material is used, green parts not packed individually can damage each other during shipment.



Figure 1: Example how the green parts should not be packed

To prevent breakage during shipping, pack your parts carefully. Bubble wrap, foam and other packing materials should be used with attention paid to the shape and design of the green part with special attention paid to thin and delicate part features. Make sure that the green part is fully wrapped, and the packing material is fixed effectively.

If bubble wrap is used, we recommend to pack items with the bubbles on the inside. This will keep green parts safely in position, as bubbles are more protected from bursting.

It is also recommended to wrap shrinkage plates and D&S support structures separately from their green parts. This will minimize possible damage between the plate and green part during shipping.



Figure 2: Wrapping the shrinkage plate in the film

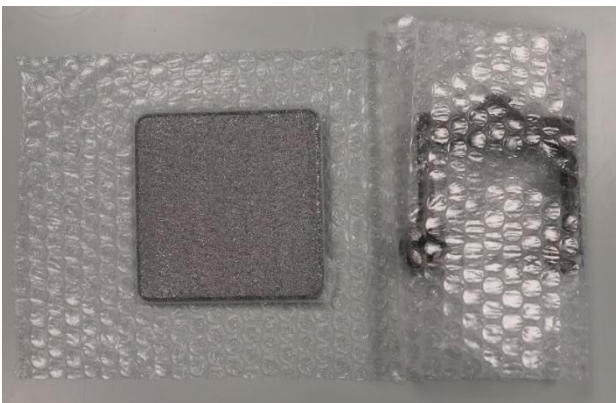


Figure 3: Packing the green part together with the shrinkage plate in the bubble wrap



Figure 4: Packed green part and shrinkage plate

In the case of thin parts like tensile bars it is recommended to wrap them one after the other in bubble wrap as shown below.

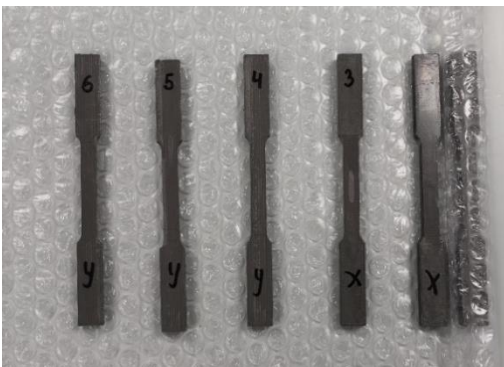


Figure 5: Example of how to wrap tensile bars in the bubble wrap

Clear and Distinctive Labeling

It is important that all green parts are marked clearly and distinctively so that they can be accurately identified. A printed label or written info/note in a package are recommended. It is required to add the Customer Order Details in a printed form to make the shipment and the parts identification unambiguous.

Labels must contain the following information:

- Customer's name
- Part's name
- Size of the green part (x, y, z)
- Weight of the green part
- Quantity (in case of tensile bars)
- Material (Ultraduse 316L or Ultraduse 17-4PH)
- Thickest wall
- Infill in percentage
- If needed, a note (e.g. use the enclosed shrinkage plate or support structures)



Figure 6: Different possibilities of parts labelling: adding a note (top left); using a printed label (top right); labelling with a foil pen (bottom).

Safe Packaging

For safe shipping the gaps in the box should be filled. Packing peanuts, styrofoam pieces, and air cushion packaging are very effective in preventing unwanted collisions between parts and shipping boxes.

Please do not forget to fill in and enclose the **Customer Order Detail document** in your box.

		Order ID: OD000281 Order Date: Mar 29, 2022, 12:10 PM					
Ultrafuse® 316L							
Customer Details		D&S Partner Address					
Company Name: BASF 3D Printing Solutions GmbH Contact Person: Friedrich Engelhorn Street: Speyerer Strasse 4 City: Heidelberg ZIP-Code+State: , Country: GERMANY Email: sales@basf-3dps.com Phone: +49622167417900 VAT ID: DE3131285486		Company Name: Elnik Systems GmbH Contact Person: Jörg Nowy Street: Robert-Bosch-Str. 3 City: Waldachtal ZIP-Code+State: 72178, BW Country: GERMANY Email: estaley@elnik.com Phone: +497486964 7000 VAT ID: None					
							
No	Part Description	Quantity	Part Weight (g)	Thickness Wall (mm)	Part Infill (%)	Part Size (mm)	Comment
1	Flange	1	750	20	100	(90, 90, 50)	
Quantity of Parts: 1		Total weight: 750g		KG Deducted from Balance: 1			

Please note that the total weight of the order must not exceed the KG used to create the order. If the weight of the order exceeds the KG used, the processing of these parts cannot be guaranteed, and the order may be refused.

Please ensure, that no foreign materials (oils, plastic filaments, glues, other residues) are attached to the parts as otherwise, the processing of these parts cannot be guaranteed. The general component size should not exceed 100mmx100mmx100mm and the maximum wall thickness is 25mm. If this size is exceeded, the processing of these parts cannot be guaranteed, and the order may be refused.

After green parts are carefully wrapped and filler is added to the box, the box should be securely closed. Take care to seal all joints and exposed edges carefully.

Shipping

If you have followed all the instructions, your box is very well prepared for shipping and just needs to be addressed correctly.