

HOPPER (250 L & 500 L)



Description

Production scaling has led to a substantial increase in AM machine throughput over the past decade. However, filling a high-volume machine with small containers of powder is an ineffective and hazardous process, heightening the probability of contamination and exposure, and impeding traceability of the powder.

Carpenter Additive's Hoppers provide an intelligent solution for the transportation and storage of metal powders for AM. Available in 250 L and 500 L sizes, the Hoppers are engineered for applications that demand considerable volumetric capacity, transport security, and closed-loop system compatibility.

The Hopper facilitates handling and movement with four-way access and crane lifting capabilities. Its robust uni-body design diminishes packaging waste considerably over its lifetime, compared to plastic bottles. And it significantly reduces the risk of operator exposure and contamination.

Key Properties:

- Designed for additive manufacturing at scale
- 250 L or 500 L internal capacity options
- Safe carrying capacity of up to 2000 kg of powder¹
- Compatibility with hazardous alloys
- Fitted pressure gauge and + 0.2 bar pressure relief valve
- Push fit inerting gas connection points

Handling:

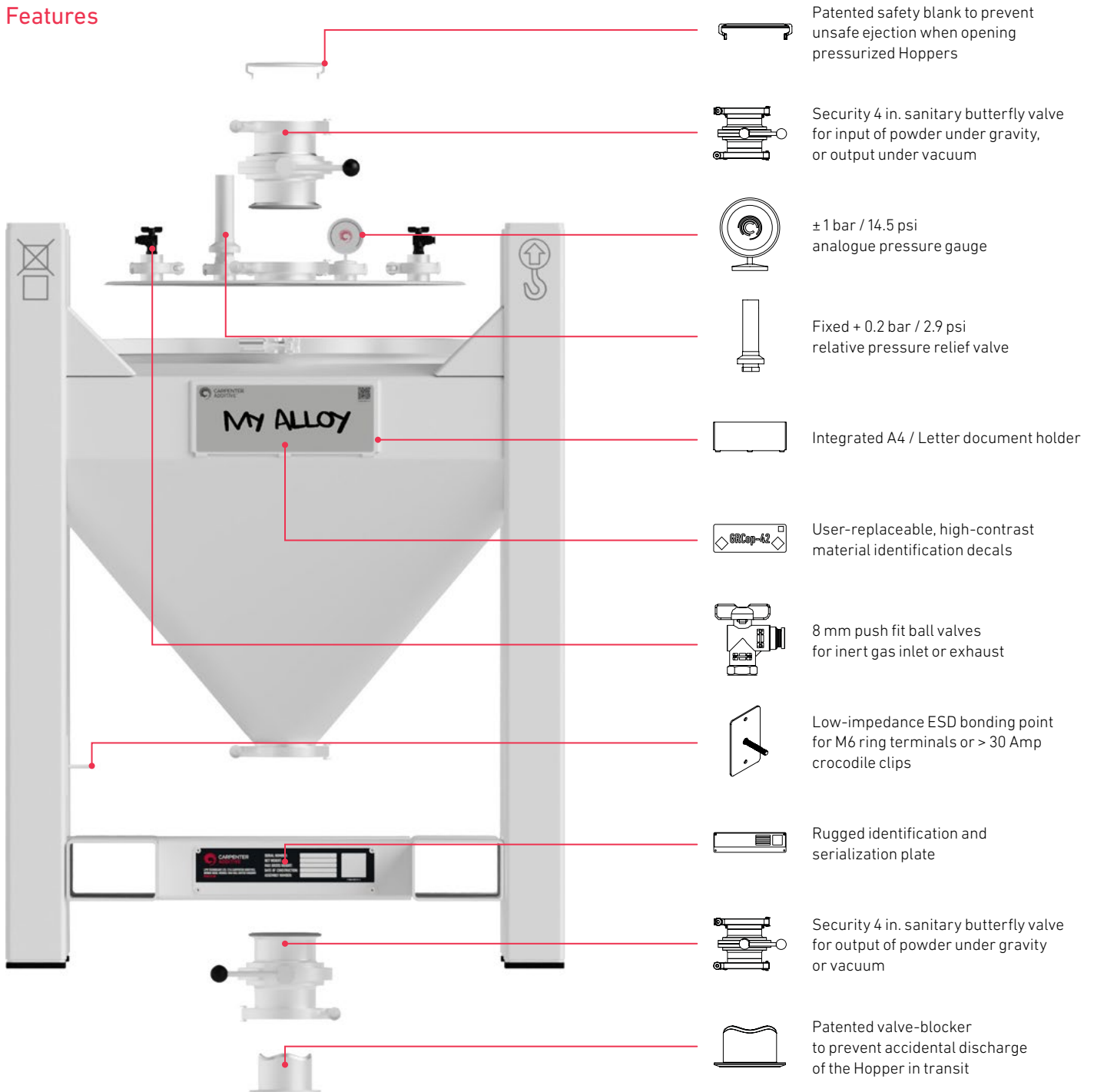
- 4-way access for pallet, pedestrian, and forklift equipment
- Provision for 4x M24 lifting bolts for crane lift
- Square profile for simple boxing












Connectivity:

- 4 in. sanitary input and output valve connections
- Patented safety blank and valve blocker caps²

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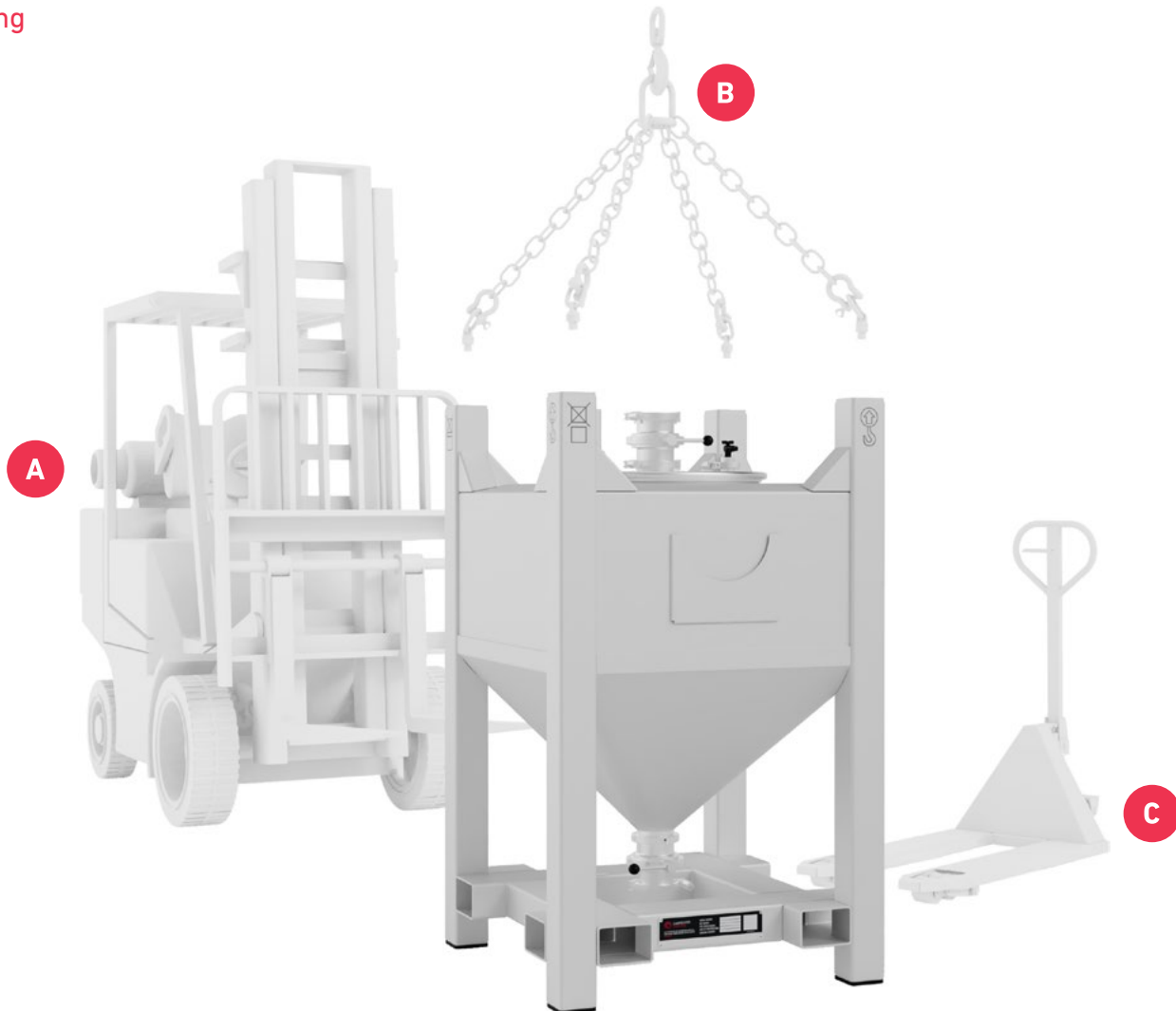
Features



-  Patented safety blank to prevent unsafe ejection when opening pressurized Hoppers
-  Security 4 in. sanitary butterfly valve for input of powder under gravity, or output under vacuum
-  ± 1 bar / 14.5 psi analogue pressure gauge
-  Fixed + 0.2 bar / 2.9 psi relative pressure relief valve
-  Integrated A4 / Letter document holder
-  User-replaceable, high-contrast material identification decals
-  8 mm push fit ball valves for inert gas inlet or exhaust
-  Low-impedance ESD bonding point for M6 ring terminals or > 30 Amp crocodile clips
-  Rugged identification and serialization plate
-  Security 4 in. sanitary butterfly valve for output of powder under gravity or vacuum
-  Patented valve-blocker to prevent accidental discharge of the Hopper in transit

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Handling


A: COUNTERBALANCE FORKLIFT

Type	4-way access through pockets
Fork spacing CTC	560 mm / 22 in
Fork length	> 800 mm / 32 in
Fork width	< 127 mm / 5 in
Load limit	> 2500 kg / 5512 lb

B: CRANE LIFT

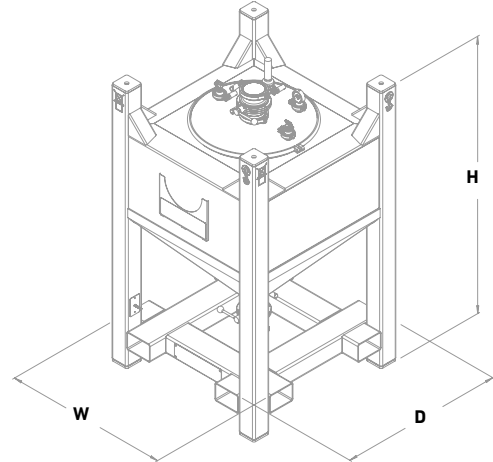
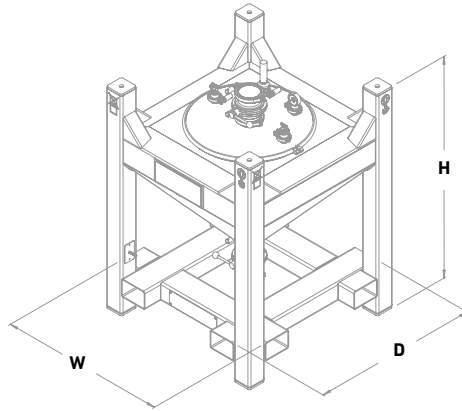
Type	4-point lift
Bolts	Swivel eye bolt (Grade 80)
Size	M24 x 40 mm
Load limit (0°)	> 6000 kg / 13228 lb
Chain angle	0° to 45°

C: PALLETTE / PEDESTRIAN TRUCK

Type	4-way access beneath pockets
Outer width	< 685 mm / 27 in
Lift height	> 150 mm / 6 in
Fork length	> 800 mm / 32 in
Load limit	> 2500 kg / 5512 lb

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Specifications



	250 L / 66 GAL	500 L / 132 GAL
Width (W)	915 mm / 36 in	915 mm / 36 in
Depth (D)	915 mm / 36 in	915 mm / 36 in
Height (H)	1220 mm / 48 in	1535 mm / 61 in
Net weight	225 kg / 497 lb	275 kg / 607 lb
Max gross weight	1225 kg / 2701 lb	2275 kg / 5016 lb

LOAD LIMIT ³	MAXIMUM LOAD MASS		MAXIMUM LOAD MASS	
	ON-SITE, ROAD, OR SEA	AIR FREIGHT	ON-SITE, ROAD, OR SEA	AIR FREIGHT
ALLOY ⁴				
Nickel / Iron / Cobalt	1000 kg / 2204 lb	1000 kg / 2204 lb	2000 kg / 4409 lb	2000 kg / 4409 lb
Titanium (> 45 µm)	600 kg / 1322 lb	600 kg / 1322 lb	1200 kg / 2645 lb	1200 kg / 2645 lb
Aluminum alloy	325 kg / 716 lb	325 kg / 716 lb	650 kg / 1433 lb	650 kg / 1433 lb
♦ Copper	1000 kg / 2204 lb	400 kg / 881 lb [†]	2000 kg / 4409 lb	400 kg / 881 lb [†]
♦ Titanium (< 45 µm)	600 kg / 1322 lb	50 kg / 110 lb [†]	1000 kg / 2204 lb [†]	50 kg / 110 lb [†]
♦ AlMgSc	325 kg / 716 lb	—	650 kg / 1433 lb	—
Other alloys	Contact Carpenter Additive		Contact Carpenter Additive	

♦ Classified as dangerous goods. Maximum capacity adjusted accordingly. Consult the Material Safety Datasheet (MSDS).

[†] Value limited by dangerous goods legislation.

OTHER SPECIFICATIONS	
Material	Body: 304L Stainless Steel. Skid-plates: Nylon. Gaskets: FDA-grade silicone and EPDM.
Finish	External surfaces: Uncoated, bead-blasted. Internal surfaces: Uncoated, polished (0.5 Ra).
IP rating	IP 65 ⁵
Structural	Ground handling: > 3:1 FoS. Crane handling: > 2:1 FoS. Transportation: > 2:1 FoS. ⁶
External environment	+1°C to +50°C (< 95 % RH non-condensing), keep out of direct sunlight
Internal environment	Argon (Ar), Nitrogen (N2), or Air (< 40 % RH non-condensing, low-salinity)
Contents	Metal powder for AM: 1 µm to 150 µm particle size
Certification	UN: IBC 21A (Y) ⁷
Standards	ISO 16495:2022
Maintenance	Monthly: External inspection. 30-month: Pressure-test and full inspection. 5-year: UN revalidation. ⁸
Product status	Preview ⁹

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Frequently asked questions

WHAT DOES PREVIEW PRODUCT STATUS MEAN FOR THE HOPPER?

The Hopper is a new product in the final stages of conformity assessment. Consequently, some features may be subject to change before release. Contact our team to uncover the opportunities this innovative new platform can provide for you.

WHAT ARE BEST PRACTICES FOR USING THE HOPPER?

Our team of experts can help evaluate your operations and offer comprehensive solutions for managing your powder inventory. This includes guidance on how to optimally use the Hopper for tasks like receiving powder (eliminating the need for bottles or drums), returning scrap/revert, and integrating it into your shop floor processes. This way, you can concentrate on maximizing the utilization of your site.

CAN I USE THE HOPPER WITH DIFFERENT ALLOYS?

Yes, but it is crucial to thoroughly review the Hopper datasheet, the Material Safety Data Sheet (MSDS), and adhere to local and transport regulations. Reach out to us if you are uncertain.

CAN I SWITCH THE ALLOY CONTENTS OF THE HOPPER?

Yes, provided that a comprehensive cleaning is performed. For detailed instructions on cleaning and maintenance, please refer to the Product Manual. Additionally, we can provide replacement material identification decals upon request.

HOW SHOULD I CLEAN THE HOPPER?

Please consult the Product Manual for detailed instructions on cleaning and maintenance procedures.

WHAT IS THE MAXIMUM AMOUNT OF POWDER THE HOPPER CAN HOLD?

The Hopper has the capacity to hold up to 500 L or 2000 kg in its largest variant. However, the actual amount can vary based on the type of alloy, its relative density, and its usage. For specific limits, refer to the Load Limit table or contact us.

WHAT IS THE BEST WAY TO MOVE THE HOPPER?

The Hopper may be handled using a UK/Euro/US-sized pallet truck, a pedestrian truck, a counterbalance forklift, or a crane. Do not attempt to move the product by hand. For specific ratings, refer to the Handling section or contact us.

CAN YOU DELIVER POWDER WITH THE HOPPER VIA AIR FREIGHT?

Yes, most non-hazardous alloys can be transported by air. However certain restrictions apply to dangerous goods. For specific limits, refer to the Load Limit table or contact us.

HOW IS POWDER TRACKED IN STORAGE?

The Hopper is produced with a unique serial number for easy identification. Additionally, our expert team can help assess your operations and propose a full range of solutions for effective powder inventory management.

WHAT IS THE EXPECTED LIFESPAN OF THE HOPPER?

The Hopper is designed to be the definitive reusable powder vessel for continuous transport and shop-floor usage up to 500 L. With the right usage, maintenance, and cleaning, it doesn't have a defined operational lifespan.

CAN THE HOPPER BE CONNECTED TO MY AM MACHINE?

Absolutely. Our team of experts are available to provide connection solutions to most AM machines and ancillary processes. Contact us for assistance.

¹ Alloy dependent, limited to 500 L Hopper.

² Patents granted: US11287056B2, GB2583110A. Patents pending.

³ Capacity limits based on typical alloy bulk density, do not exceed gross mass limit or internal volume. The Hopper is classified as, and should be used as, single packaging; capacity values reflect this. Do not palletize. Consult local legislation on material transportation. The sender is ultimately responsible for complying with the relevant transport legislation.

⁴ Certain alloys may be classified as dangerous goods under the UN Recommendations on the Transport of Dangerous Goods (UNRTDG). Consult the Material Safety Datasheet (MSDS) for classification. This product must only be filled with metal powder for Additive Manufacturing.

⁵ Designed to IP 65.

⁶ Handling FoS simulated based on 25% overloaded vessel. Transportation FoS simulated rapid deceleration at 2 g, loaded to 1 200 kg.

⁷ UN Dangerous Goods IBC testing pending certification.

⁸ Consult the product manual for further information.

⁹ Preview: This product is not in production. This product may be subject to changes during engineering validation until it is released to production.



**Sustainable metal Hoppers
for production-scale AM**

CarpenterAdditive.com/Talk-To-Us

**For additional information, please
contact your nearest sales office:**

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The mechanical and physical properties of any additively-manufactured material are strongly dependent on the processing conditions used to produce the final part. Significantly differing properties can be obtained by utilizing different equipment, different process parameters, different build rates and different geometries. The properties listed are intended as a guide only and should not be used as design data.

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