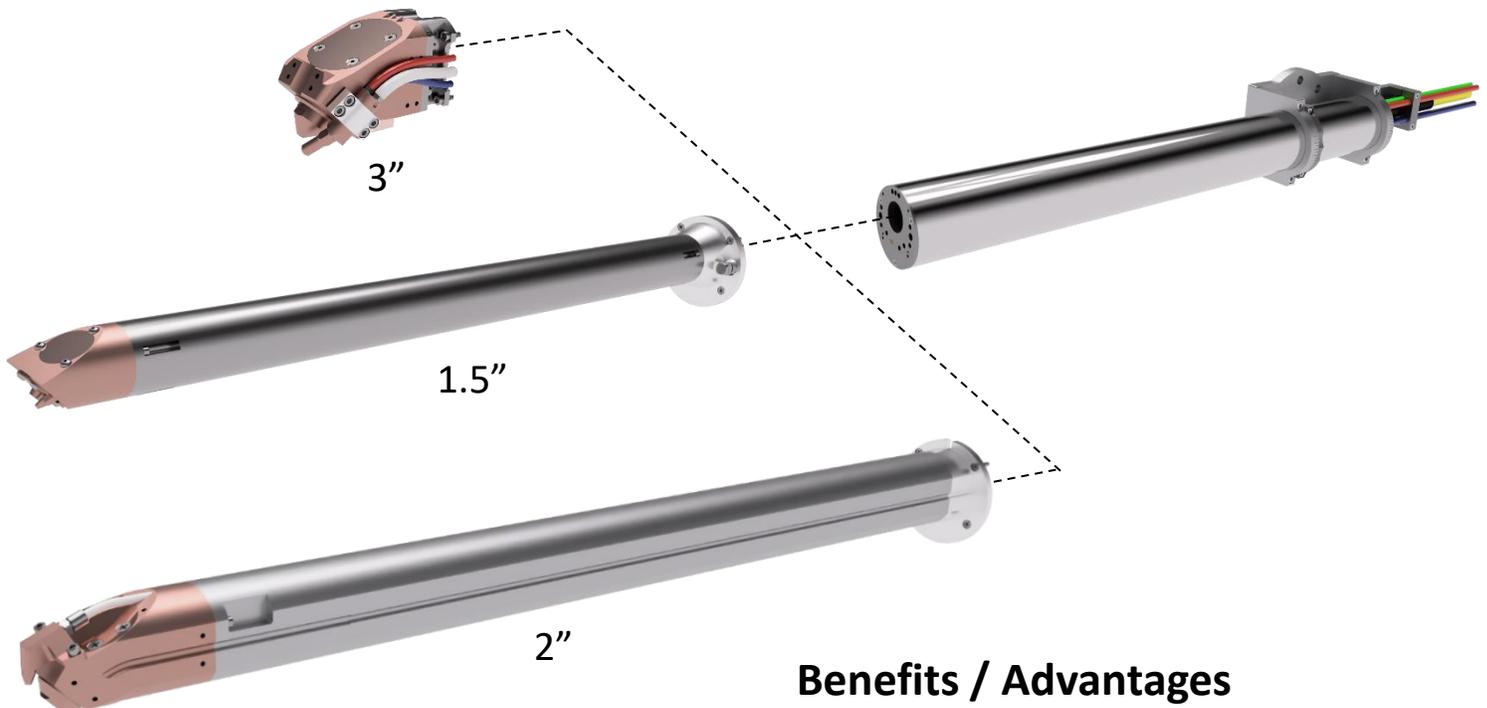


DB-IHS

Deep Bore Interchangeable Head System



The DB-IHS (Deep Bore Interchangeable Head System) is Nittany Laser's most versatile head yet. The interchangeable head system uses a common collimating unit and mounting system and is available with three different size ID cladding heads. These heads can be exchanged easily in under 10 minutes, without removing the fiber from the end of the tool. Each of the 3 head attachments are based on ID tools we have been perfecting for the past 12 years, now with a standardized connection.

Benefits / Advantages

- 3 different size head attachments for maximum deposition rate
- Up to 4000 watts power (3" attachment)
- Able to clad internal diameters as small as 1.5 inches (with 1.5" attachment)
- Compatible with powder, wire, or hotwire
- Compatible with almost all fiber delivered lasers
- Excellent powder capture efficiency
- Stays cool even when operating at full power in a preheated bore
- Produces excellent clads in any orientation without changing process parameters
- Coaxial gas provides shielding and prevents damage to optics
- Compatible with QB, QD, or Q5 fiber optic cables

DB-IHS

Deep Bore Interchangeable Head System



DB-IHS Base Assembly

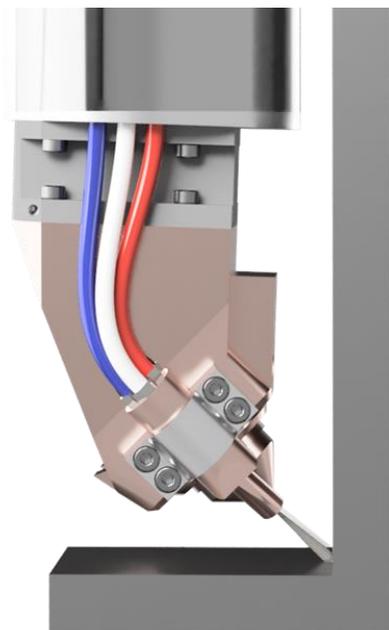
The Deep Bore Interchangeable Head System starts with the Base Assembly which is used in combination with each of the head attachments. This assembly houses the collimator assembly, as well as the fiber connection and the connections for cooling, shield gas, and powder or wire. The robot mounting bracket is customized to match the customer's robot / CNC system. The collimator is rated for 4000 watts power at 100% duty cycle. Full power can be used for the 3" head, however the 2" and 1.5" heads are limited to 3000 watts and 1800 watts, respectively. The length of main tube of the base assembly can be customized based on the customer's needs with standard versions available up to 2 meters (extended versions up to 10 meters).

DB-IHS Head Attachments

Every DB-IHS head has extensive water cooling integrated into the head, maximizing the heat removal from the tool and allowing hours of continuous cladding operation even inside long preheated bores.

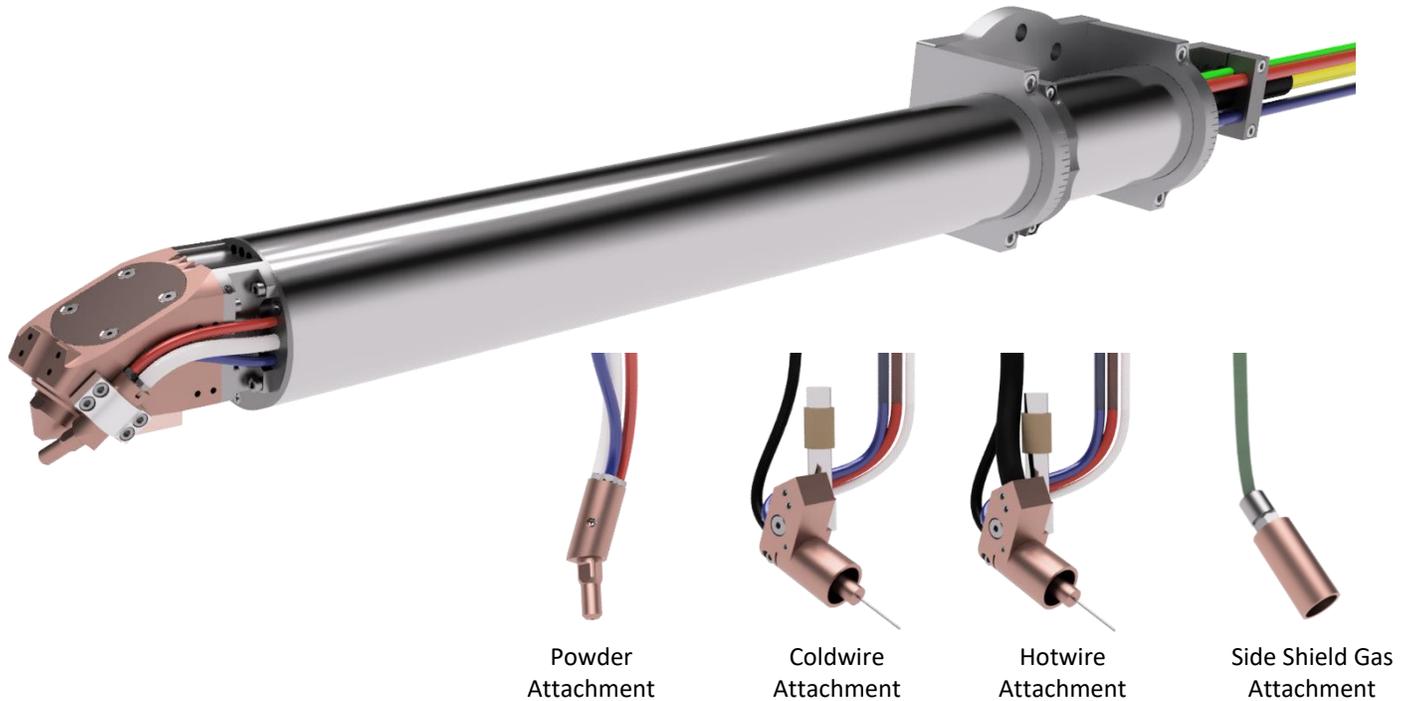
Every DB-IHS head is designed with a 45° beam angle which provides several key advantages over standard tools:

- It is able to clad almost any surface, including IDs, ODs, inside conical shapes, flat surfaces, corners... all without making adjustments to the head
- There are no problems with back reflection of the laser beam
- Any powder not captured in the weld is much less likely to bounce back into the tool
- The beam angle helps prevent lack of fusion at the root of the previous weld
- Optical path is larger and further from the melt pool, reducing frequency of damaged cover lenses / optics



DB-IHS

Deep Bore Interchangeable Head System – 3” Head



The 3” Head is the workhorse of the Deep Bore Interchangeable Head System. With 4000 watts of power it is designed for high deposition rates. It is also the most versatile head with wire and hotwire options available in addition to powder. Supplemental shielding options are also available.

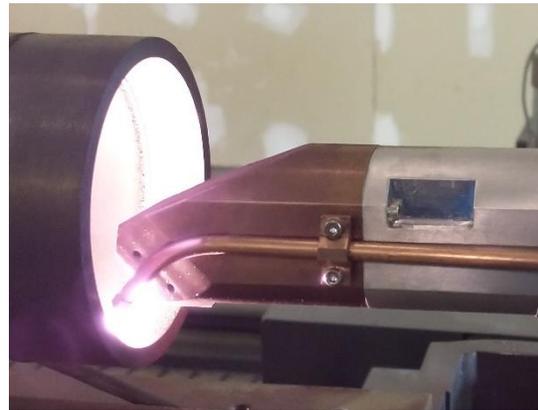
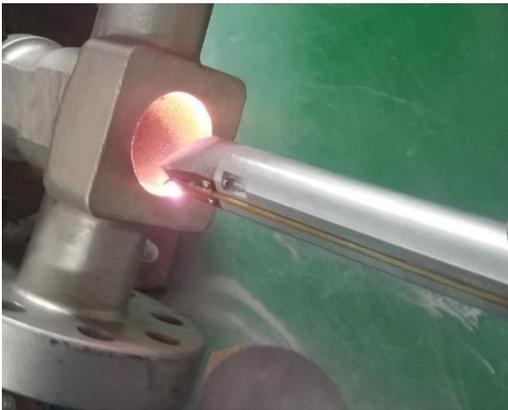
	3” Head
Maximum Power	4000 watts
Tube Diameters	3” ID and above (76mm)
Maximum Clad Length	Up to 80” standard (custom 360”+)
Fine Adjust of Filler Material Placement	Yes
Setup Camera	Yes
Clad Seating Surfaces	Yes
Supplemental Shielding	Front and side mounted options available
Powder Options	Side or rear mounted powder bracket options
Wire Options	Coldwire and Hotwire

DB-IHS

Deep Bore Interchangeable Head System – 2” Head



The 2” head is a highly reliable, robust tool for cladding with powder in bores as small as 2” in diameter and up to 24” deep. Switching between heads is accomplished by disconnecting the powder line, blowing the water out of the coolant lines, and removing the four mounting screws. The powder line is attached to the new head, and the four mounting screws secure the head to the base assembly. It is as simple as that!



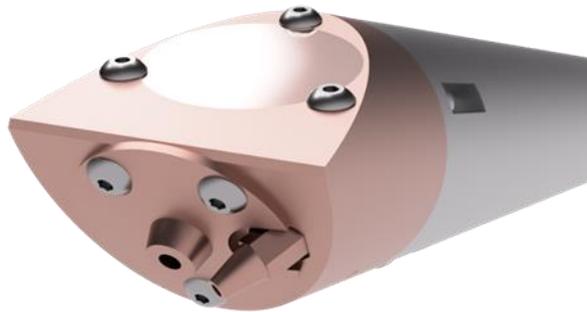
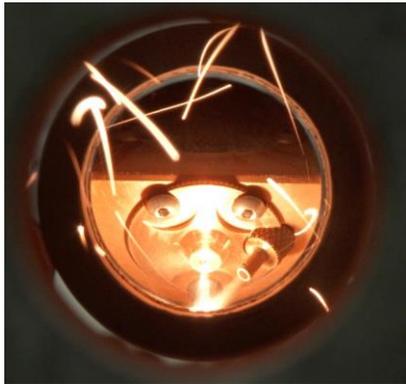
	2” Head
Maximum Power	3000 watts
Tube Diameters	2” ID and above (50.4mm)
Maximum Clad Length	Up to 24”
Fine Adjust of Filler Material Placement	Yes
Setup Camera	Yes
Clad Seating Surfaces	Yes
Powder Options	Side or rear mounted powder bracket options
Wire Options	N/A

DB-IHS

Deep Bore Interchangeable Head System – 1.5” Head



The 1.5” head is the smallest attachment currently available with the DB-IHS system. It is capable of cladding bores as small as 1.5” in diameter and up to 18” deep. As with all of our tools, the 1.5” head is a robust tool which used in production industrial settings around the world.



	1.5” Head
Maximum Power	1800 watts
Tube Diameters	1.5” ID and above (38.1mm)
Maximum Clad Length	Up to 18”
Fine Adjust of Filler Material Placement	N/A
Setup Camera	Yes
Clad Seating Surfaces	Yes
Powder Options	Side mounted powder bracket
Wire Options	N/A