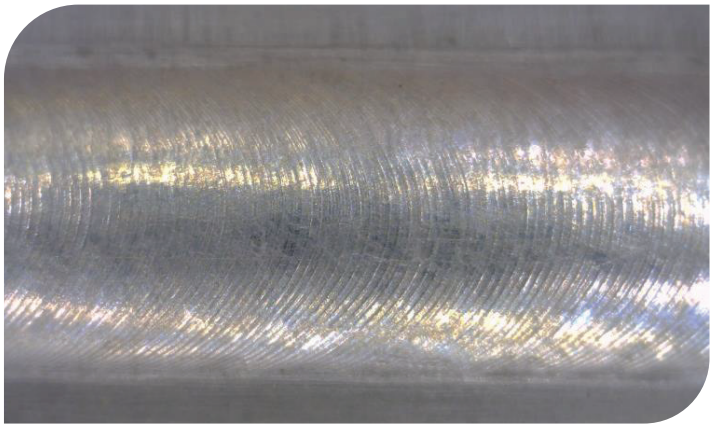
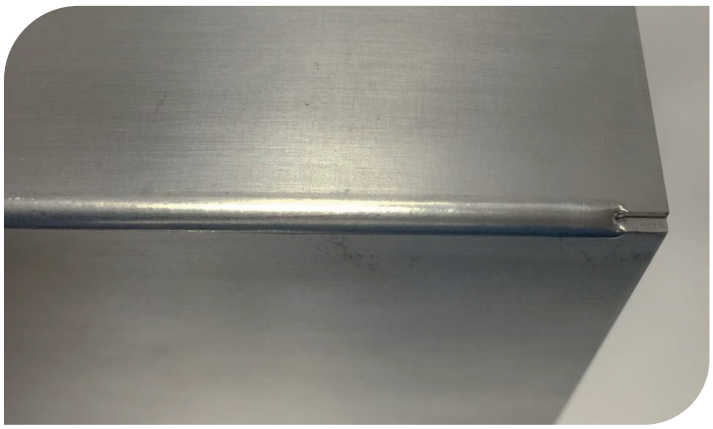
IPG Photonics Wobble Heads

from the World Leader in Fiber Lasers





Applications

Features

Advantages

IPG PHOTONICS®

www.ipgphotonics.com

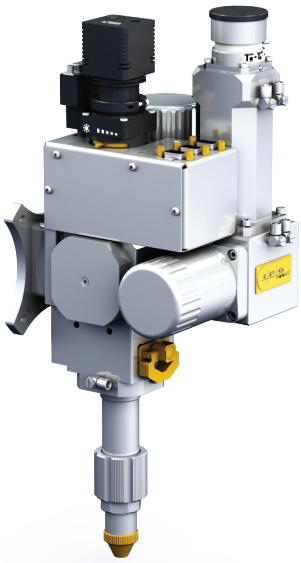
The Power to Transform

Wobble Heads

IPG Photonics' D30 & D50 Processing Heads

Standard Features

IPG's Wobble welding heads are designed to provide the highest laser power handling capability in the industry in a completely sealed and lightweight package. These process heads provide effortless integration with IPG lasers and offers improved weld quality and better visual finish. Available in multiple configurations with the broadest focus and collimator lens options, the Wobblers are the ultimate tool to weld a multitude of different material types and thicknesses.



FLW-D30-W

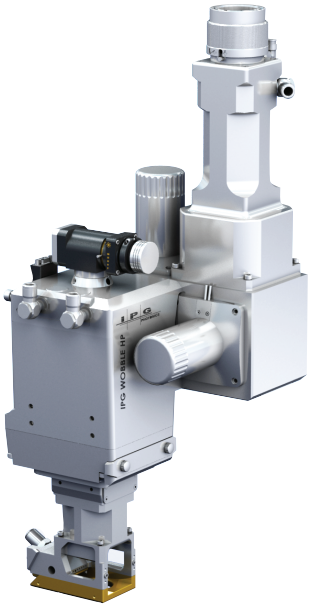
IPG D30 Wobble Welding Head

Power Handling up to 6 kW with a variety of wobble shapes at frequencies up to 1 kHz

FLW-D50-W

IPG D50 Wobble Welding Head

Power Handling up to 12 kW with a variety of wobble shapes at frequencies up to 700 Hz



FLW-D85-W

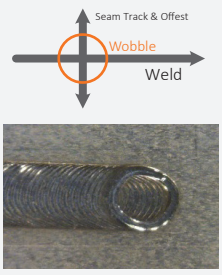
IPG D85 Wobble Welding Head

Wobble welding head for laser welding applications at up to 30 kW

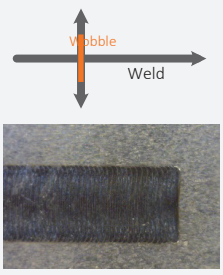
Wobble Modes

In addition to the wobble modes, both wobble frequency and amplitude can be adjusted for process optimization

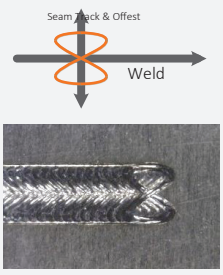
CW/CCW CIRCLE



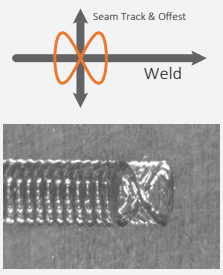
LINEAR



EIGHT

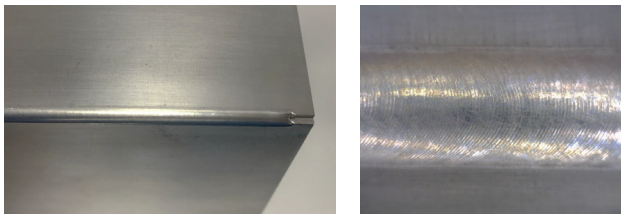


INFINITY



Enhanced Weld Quality & Consistency

Compared to conventional (laser) welding methods, welding with the wobble option results in superior weld quality. Wobbling also helps to overcome consistency issues related to backreflections when welding materials like aluminum, copper, etc.



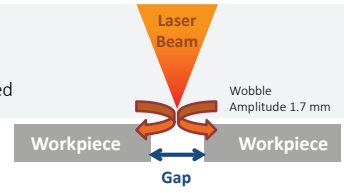
Corner weld on 6061-T6 aluminum (thickness 1.5 mm). The picture on the left showing the overall quality and the microscopic image on the right showing the close up of the weld

Greater Tolerance for Process Variables

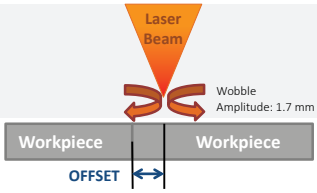
As it comes to process variables, such as the gap between the workpieces, wobble welding allows a considerably wider process parameter window that results in good quality welds.

O = Good Weld
Δ = Acceptable
x = Unacceptable/ not welded

Variable Gap Between Workpieces



Variable Offset

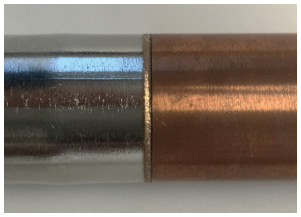


Gap (µm)	0	50	100	150	200	250	300	350	400	450	500
Conventional Laser Welding	O	O	Δ	Δ	x	x	x	x	x	x	x
Laser Welding with Wobble	O	O	O	O	O	O	Δ	Δ	Δ	Δ	x

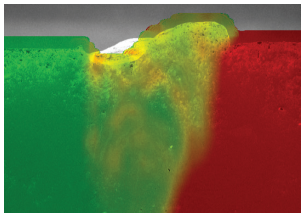
Offset (µm)	0	50	100	200	300	400	500	600	700	800	900	1000
Conventional Laser Welding	O	O	O	O	Δ	x	x	x	x	x	x	x
Laser Welding with Wobble	O	O	O	O	O	O	O	Δ	Δ	Δ	Δ	x

Improved Welding of Dissimilar Materials

When welding dissimilar metals with the Wobbler, melting behavior of different materials can be balanced by adjusting wobble parameters. The melting and solidification of the intermetallic layer can be controlled to improve weld quality.



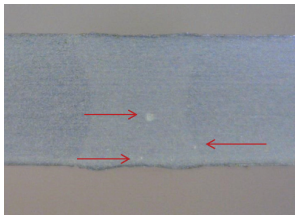
304 stainless steel and oxygen free copper tubes welded together using circular wobble



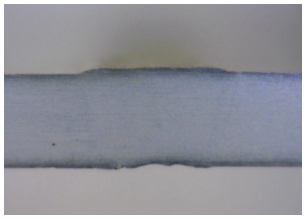
EDS-image showing the blending of the metals in the cross section of the weld

Welding Materials Prone to Cracking/Porosity

For materials which are sensitive to welding defects such as pore formation and cracking, utilizing the wobbler welding head, the welding process can be further optimized to minimize welding defects.



6061 aluminum sample welded with conventional laser welding process: obvious pores in the cross section



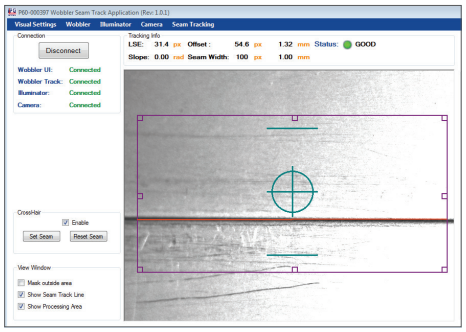
6061 aluminum sample welded with the wobbler head: the cross section is free of porosity

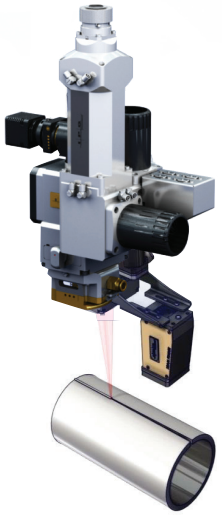
Optional Features

Expanding Process Capabilities

Seam Tracking

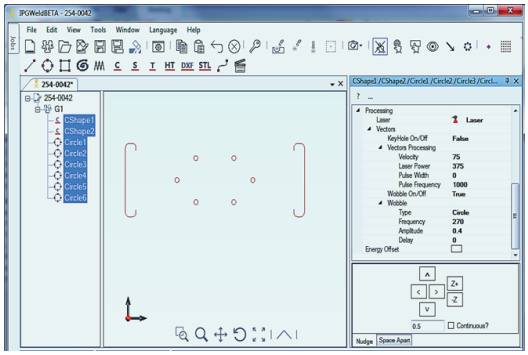
- Complete seam tracking system
- Increases productivity through automated adjustment of weld location to match varying seam positions
- Utilizes high speed CCD camera and LED strobe illumination to image fast moving parts
- Locates seams with <10 um accuracy
- Provides increased process consistency

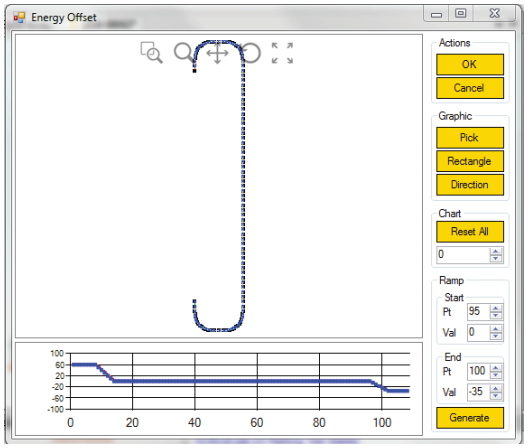




Wobbler with Scan Controller

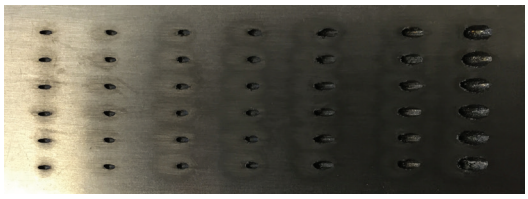
- Utilizes IPG Scan Controller and IPGWeld Software for job setup and execution.
- Ideal for applications with tight tolerances and/or thermally sensitive parts, for example: medical components and battery welding.
- Desired weld geometries can be drawn on IPGWeld or imported as a .dxf file. Wobble function can be enabled for any weld shape.
- Accurate control over laser power: pulsing and power ramping can be modified easily.





Other Process Capabilities

- Laser Drilling: Wobble function can be used to drill holes with adjustable diameter.
- Additive Manufacturing



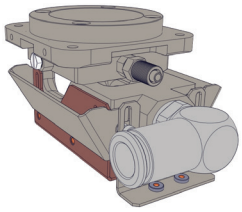
Wobble Head Configurations

D30 & D50 Available Options

	Configuration	Collimator	Focus	Fiber Receiver
D30-Wobbler Rated up to 6 kW Example: P30-010533-V4E1 P30-010533 – D30 Wobbler with Air Cooled Controller P30-010493 – D30 Wobbler with Scan Controller	V Vertical	1 50 mm 2 60 mm 3 85 mm 4 100 mm	A 100 mm B 125 mm C 150 mm D 200 mm E 250 mm F 300 mm G 500 mm H 400 mm	1 HLC-8 (QBH type) 2 LCA (QD type)
D50-Wobbler Rated up to 12 kW Example: P30-010595-V7A1 P30-010595 – D50 Wobbler with Air Cooled Controller P30-010494 – D50 Wobbler with Scan Controller	L Horizontal LHS V Vertical	1 100 mm 2 120 mm 3 140 mm 4 150 mm 5 160 mm 6 180 mm 7 200 mm	A 150 mm B 200 mm C 250 mm D 300 mm E 400 mm F 500 mm G 600 mm H 700 mm I 800 mm J 900 mm K 1000 mm	1 HLC-8 (QBH type) 2 LCA (QD type) 3 HLC-16

Welding Accessories

Expanding Process Capabilities



Air Knife with Purge

Integrated purge module provides additional protection for cover slide. Gas assist can be attached to serve as plume suppression.

FLW-D30: P30-002163

FLW-D50: P30-007272

Coaxial Nozzle

Shield gas is delivered coaxially to the weld site. Telescoping option available. Suppresses weld plume.

FLW-D30: P30-002650-XXX

F100, F125, F150, F200, F250, F300

FLW-D50: P30-007401-XXX

F150, F200, F250, F300

Gas Assist

Can be attached to air knife or directly to head. Can be used to deliver off-axis shield gas to weld site. Suppresses weld plume. Multiple inputs

P30-002452

Welding Head Alarm Module

Monitors cover slide presence, contamination and temperature as well as mirror temperature

P30-007325

Camera Options

(Camera Arm Assembly Required)

Digital HD Camera

P30-007443 - HD Camera

- Direct connectivity to any HD monitor (No PC Required)
- 1/3" CCD
- True 720p HD O/P @ 60fps
- Inbuilt Cross-Hair Generator
- 40w x 40h x 45.8d

Digital Power Over Ethernet Camera

P30-007444 - Ethernet Camera

- Recommended for image processing applications (PC Required)
- 1/3" CCD
- 1.2 Megapixel resolution @ 40fps
- Cross-Hair can be generated via bundled software
- 35w x 35h x 57.3d

Camera Arm Assembly

P30-002424 (90 Degree)

P30-009929 (Straight)

with C-mount extension tube to mount camera.
Precision image position adjustment
Integrated iris
Image focus and lock

Coversides available for single unit purchase or in bulk.

IPG Photonics Corporation
World Headquarters
Oxford, MA USA
+1 508 373 1100
sales.us@ipgphotonics.com

IPG Laser GmbH
European Headquarters
Burbach, DE
+49 2736 44200
sales.europe@ipgphotonics.com

IRE-Polus Co.
IPG Russia
Fryazino, Moscow RU
+7 (495) 702 95 89
mail@ntoire-polus.ru

Brazil
+55 11 4380 9939
sales.br@ipgphotonics.com

China
+86 10 6787 3377 ext. 1020
sales@ipgbeijing.com

Czech Republic
+420 241 433 199
sales.cz-sk@ipgphotonics.com

France
+33 (0) 388 674 974
sales.france@ipgphotonics.com

India
+91 956 060 8808
sales.india@ipgphotonics.com

Italy
+39 0331 170 6900
sales.italy@ipgphotonics.com

Japan
+81 45 716 9831
info@ipgphotonics.co.jp

Mexico
+52 81 1354 2540
ipgmexico@ipgphotonics.com

Poland
+48 32 721 22 20
sales.poland@ipgphotonics.com

Singapore
+65.667.87709
sales.singapore@ipgphotonics.com

South Korea
+82 42 930 2000
ipgk@ipgphotonics.com

Spain & Portugal
+34 937 999 971
sales.spain@ipgphotonics.com

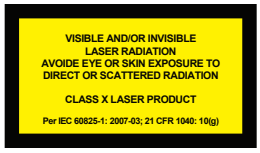
Taiwan
+886 2 27 93 3582
ahung@ipgphotonics.com

Turkey
+90 216 306 0317
sales.turkey@ipgphotonics.com

United Kingdom & Ireland
+44 0 117 203 4060
sales.uk@ipgphotonics.com

www.ipgphotonics.com

IPG Photonics manufactures a wide range of laser products with laser classifications ranging from Class I to Class IV. Please review the individual product specification for the optical performance characteristics specific to the device. This information typically includes the wavelength range, output power (CW and/or Peak), Pulse Energy, Pulse Repetition Rate, Pulse Width, etc.



R14 09/19