



WHAT does **LASER** means ?

It is an abbreviation of ...



Light

Amplification by

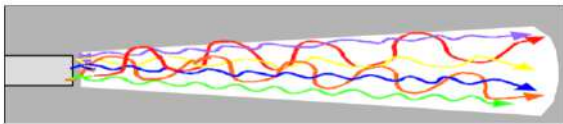
Stimulated

Emission of

Radiation

WHAT is the difference between **Light Bulb** & **Torch** and **Laser** ?

Light Bulb & **Torch**



Different Wave Length

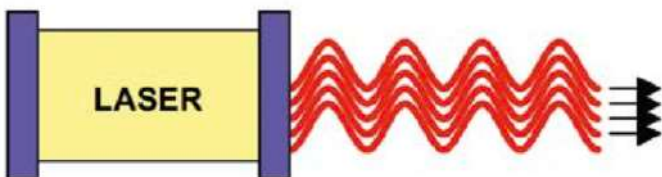


Different Colour



Waves **are not** synchronised

Laser = Coherent



Same wave length



Same colour



Waves **are** synchronised

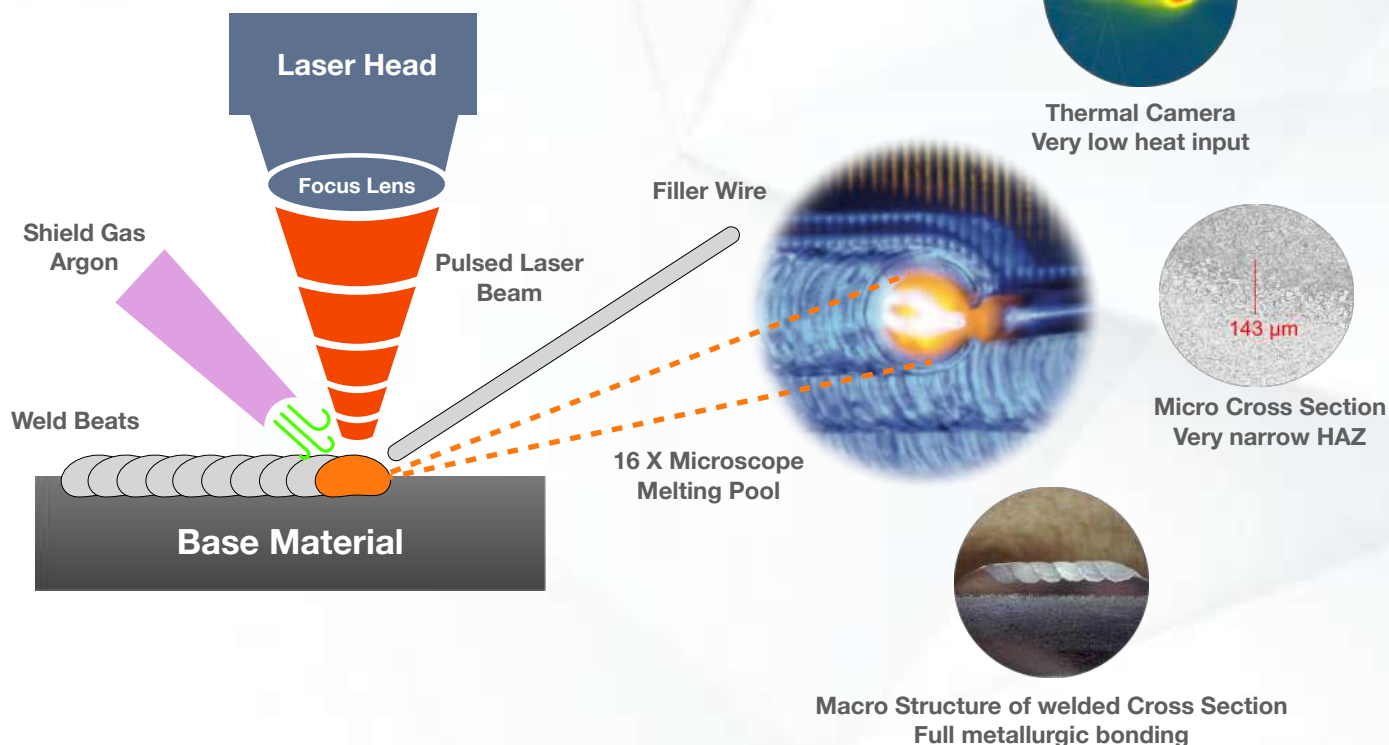


Conclusion :

Light Bulb & Torch can **never** show the characteristics of **Laser** !



Pulse Laser Welding - from different point of views



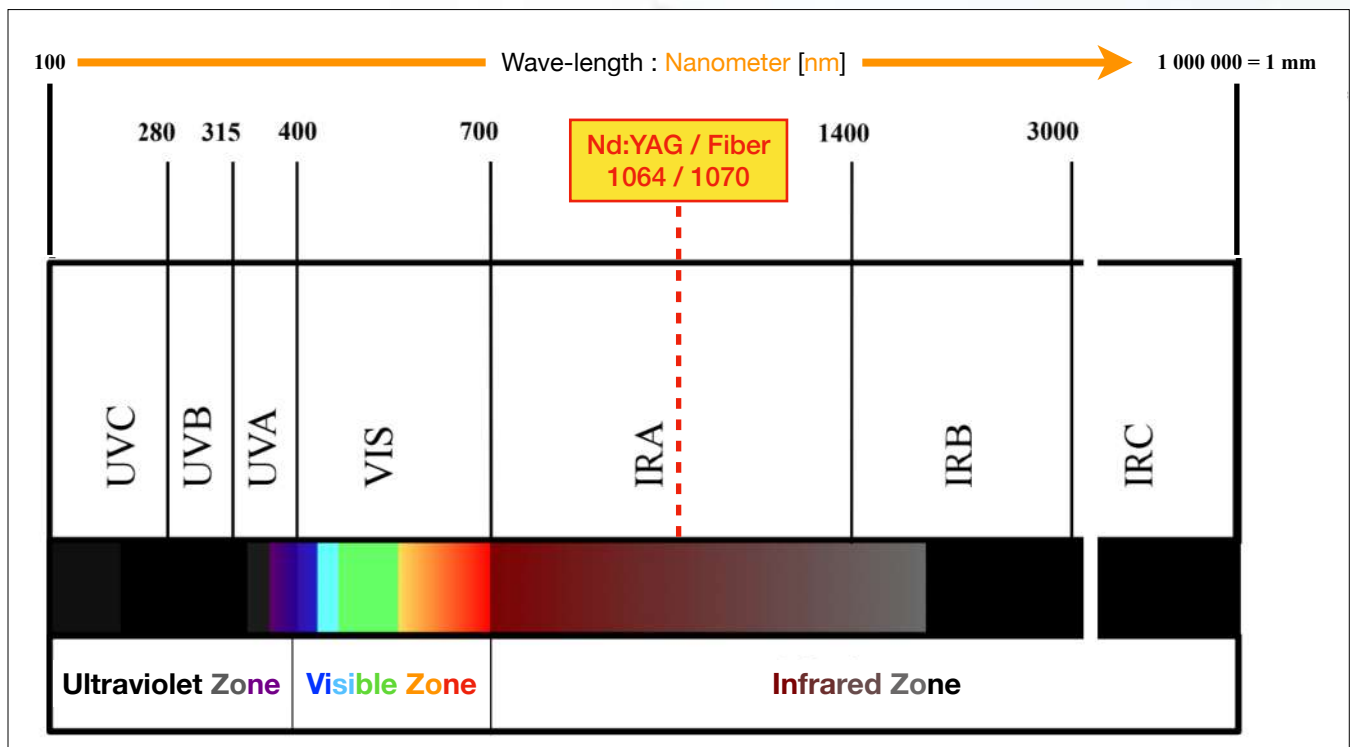
Comparison of Thermal Metal Deposition Methods

	Pulse Laser Welding	PTA	Laser Cladding	SMAW	HOVF
Source of Energy Input	Pulsed Laser Beam	Plasma / Electric Arc	CW Laser Beam	Electric Arc	Gas Flame
Heat Input	Low	High	Low / Medium	High	Low
HAZ Material SUS 431	0.05 - 0.3 mm	3.0 mm	0.1 - 0.4 mm	3.0 - 4.0 mm	0 mm
Bonding Type	Metallurgical	Metallurgical	Metallurgical	Metallurgical	Mechanical
Bonding Strength	>1000 Mpa	<800 Mpa	<800 Mpa	>800 Mpa	<80 Mpa
Heat Treatment Required	Yes	No	No	No	Yes
Deposition thickness	Unlimited	0.5 - 5.0 mm	0.1 - 10 mm	Unlimited	0.05 - 0.5 mm
Deposit Rate	0.1 - 0.35 kg/hr	1 - 5 kg/hr	1 - 30 kg/hr	1 - 30 kg/hr	1 - 9 kg/hr
Porosity	100 % dense	100 % dense	100 % dense	100 % dense	>5 %



WHY the pulsed laser is invisible ?

Pulse Laser Welding uses two different types of solid-state lasers. „**Nd:YAG**“ with a wave length of 1064 Nanometer [nm] and „**Fiber Laser**“ with a wave length of 1070 Nanometer [nm]



Good to know :

Nano is a Greek word and means Dwarf.

Hardly to imagine : 1 Nanometer [nm] is the billionth part of 1 meter.

Easy to imagine : 1 Nanometer relates to the size of a soccer ball as a soccer ball does to the size of our earth.

1 Nanometer

