

# Three Rivers Technical Conference 2008

Rockwoods Grill Convention center – August 6-7

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NORTH STAR IMAGING, INC.



# Labino AB

Develop, manufacture and sells, to the industry and the public sector high quality UV & White-light lamps that offer unique benefits and superior performance.



# The Labino Company

- Swedish company
- Founded in 1994
- Manufacturing since 1996
- Over 100 distributors in 52 countries
- 11 service centers

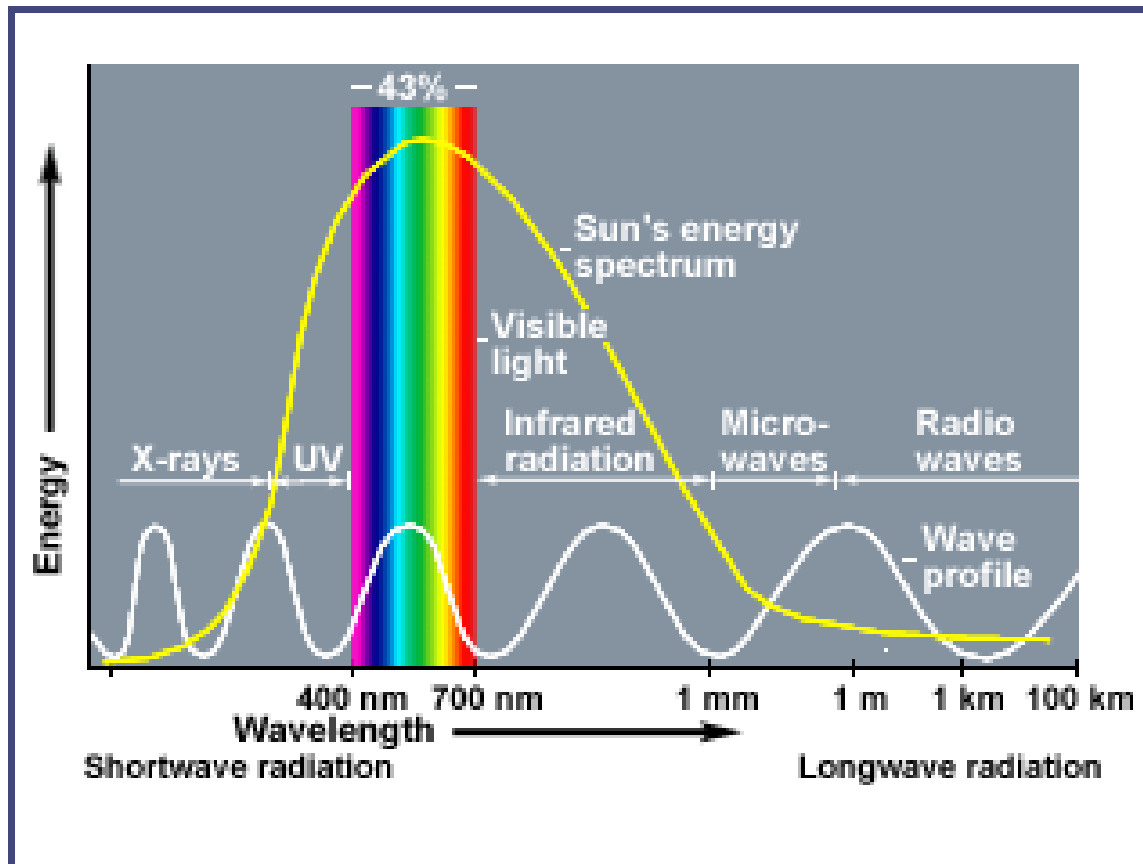


# Subjects today

- What is UV light?
- Most common UV sources
- LED characteristics
- LED products
- Questions



# What is light ?

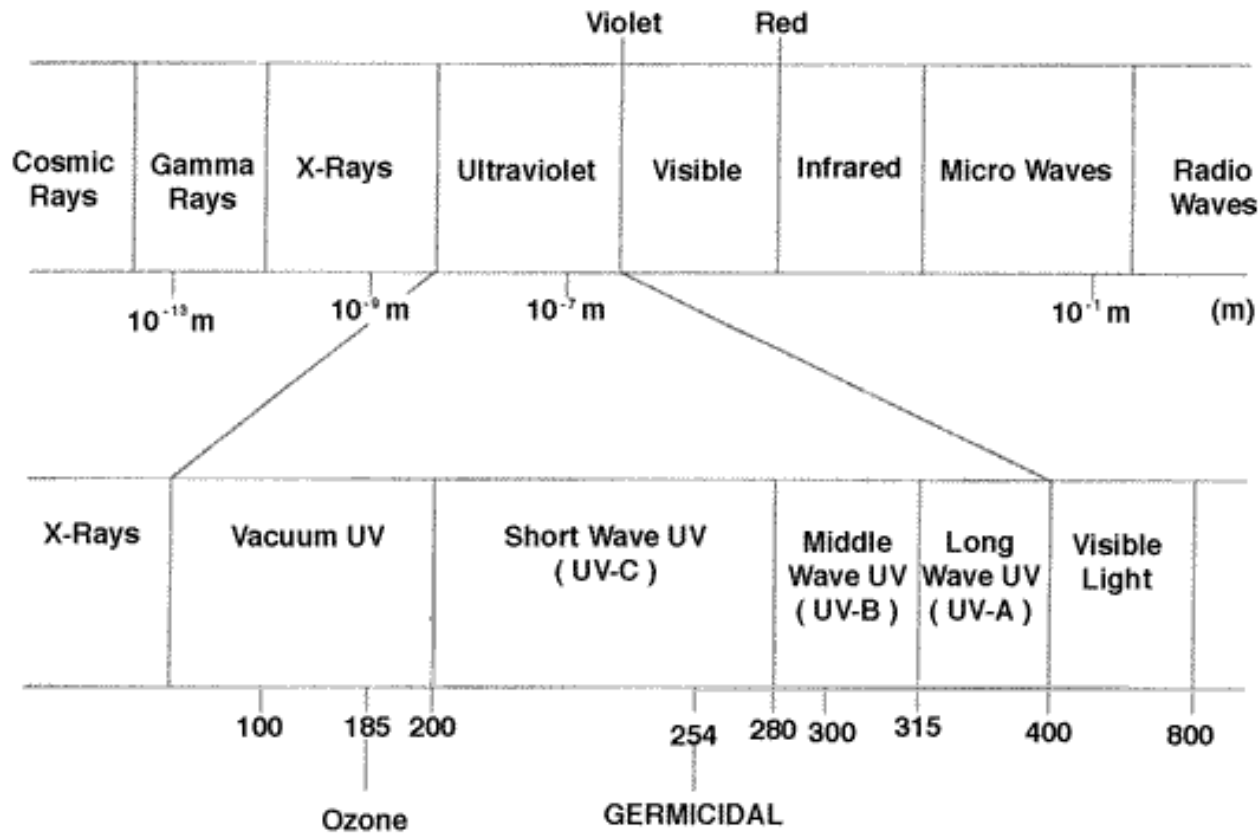


MAKES IT BRIGHT 5

# What is UV light?

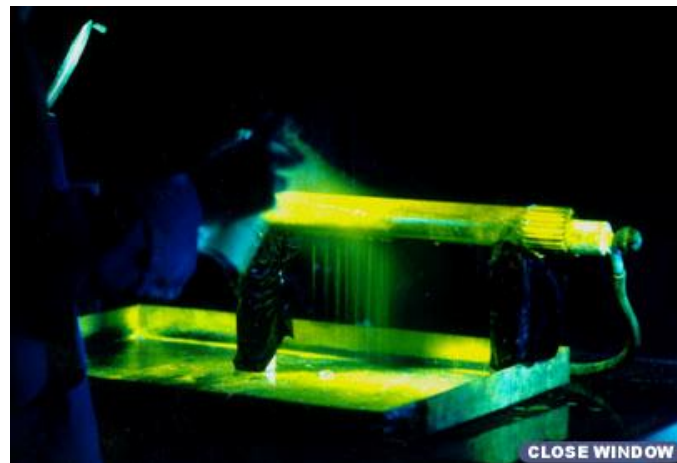
## ELECTROMAGNETIC SPECTRUM

(with expanded scale of ultraviolet radiation - - 1 Nanometer =  $10^{-9}$  m)



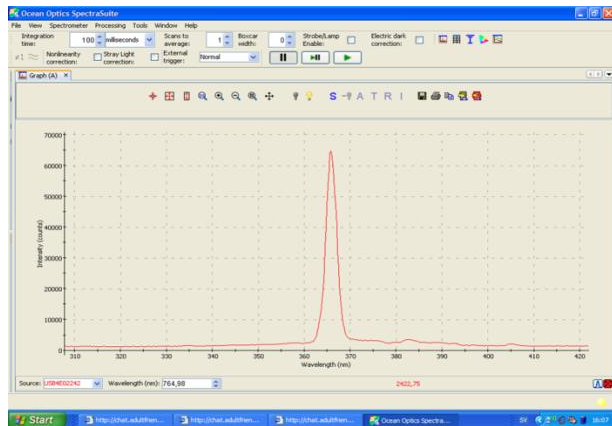
# Why UV in Non Destructive Testing

- In MPI and FPI we use substances that fluorescence when illuminate with a UV light source.
- The high energy in UV light makes the substances fluorescence.
- As the UV-light is "invisible" the contrast from the fluorescence substances optimal.



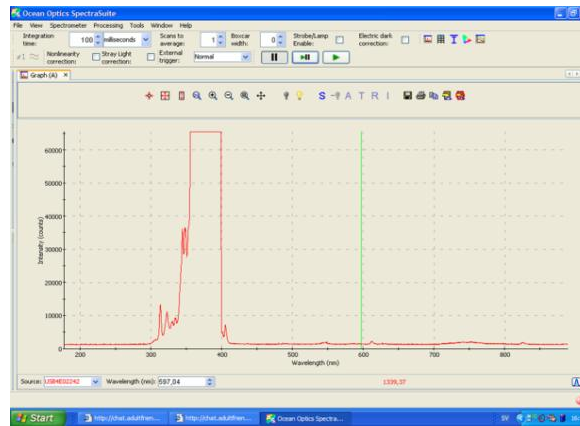
# UV-light sources

MERCURY



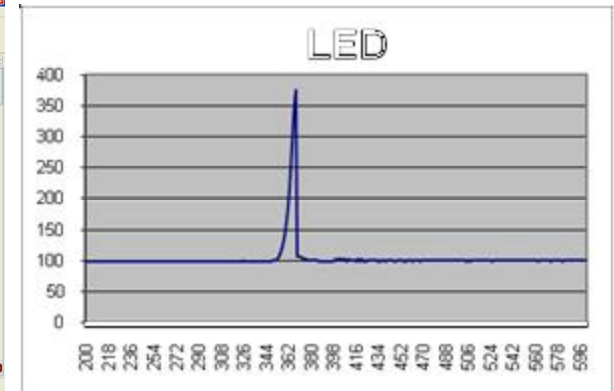
Wavelength  $\approx$  350 – 380 nm

MPXL



Wavelength  $\approx$  300 – 400 nm

LED

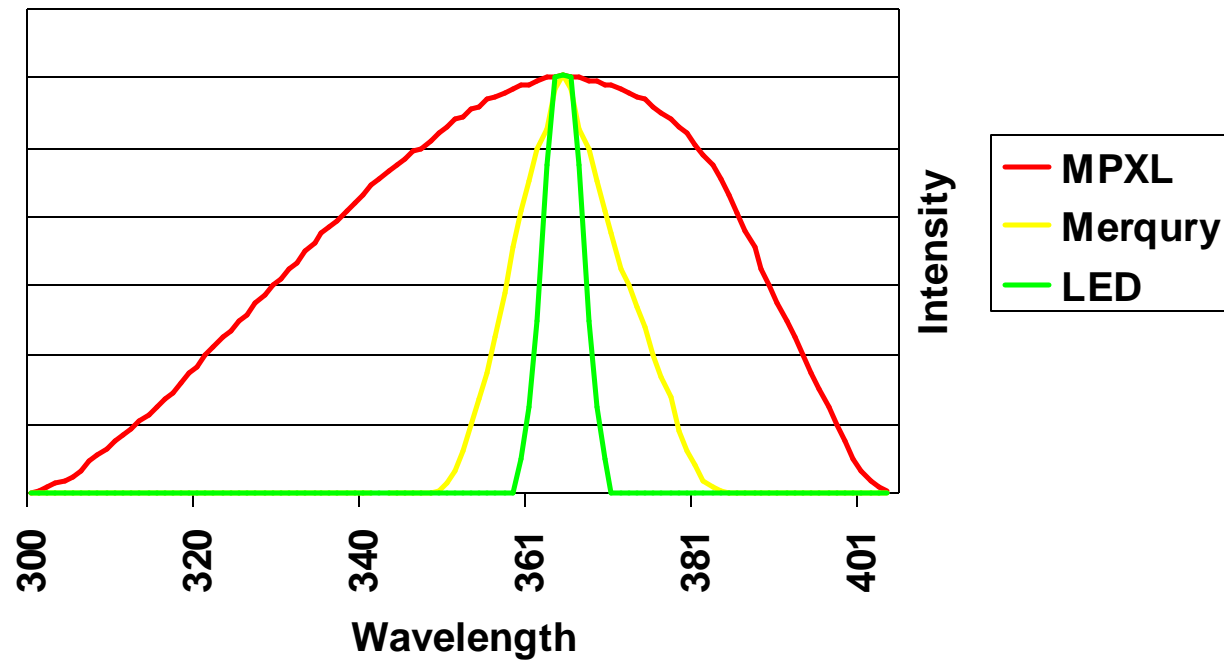


Wavelength  $\approx$  360 – 370 nm



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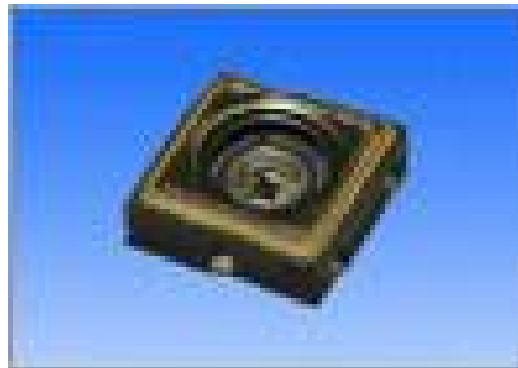
# Energy from different UV-lamps



# What is a LED?

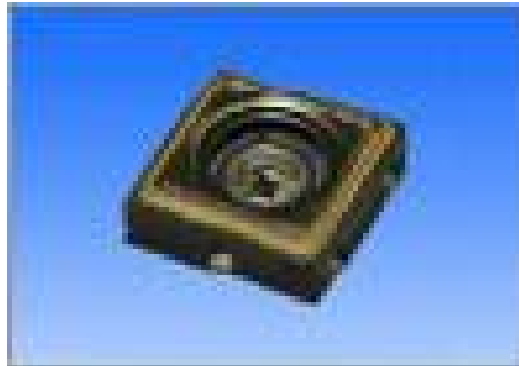
**LED – Light Emitting Diode** is a semiconductor diode that emits light when an electrical current is applied in the forward direction of the device, as in the simple LED circuit. The effect is a form of electroluminescence where incoherent and narrow-spectrum light is emitted from the p-n junction.

The color of the emitted light depends on the composition and condition of the semiconducting material used, and can be infrared, visible or ultraviolet



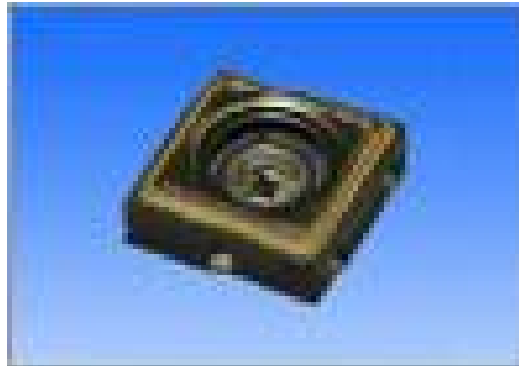
# UV – LED (+)

- Low energy consumption
- Small (both the LED and electronic)
- Instant on/off
- Safe
- No white light
- Long lifetime



# UV – LED (-)

- Wavelength
- Heat
- Intensity
- Price
- Angle of the UV-distribution



# Different LED-lamp type

	LED without lens	One LED with lens	Several LED with lenses
+	Light surface	Intensity	Wide light surface
-	Intensity	Small light spot	Price Intensity

# Different LED lamp type

## One LED with lens

Hand held UV-torches for NDT inspection when a small spot of the light beam is ok.

Intensity 4 000 – 10 000  $\mu\text{W}/\text{cm}^2$  at 15 in.



## Several LED with lenses

Traditional NDT inspection

Intensity 4 000 – 5 000  $\mu\text{W}/\text{cm}^2$  at 15 in.



# Comparing UV-lamp types

## Mercury

+

Price  
Known technology

-

Long startup time  
Heat  
Size  
Intensity  
Turns off by fall

## MPXL

High intensity  
Full power in 15 sec  
Low heat  
Keeps running after drop  
Unaffected by magnetic fields

Size

## LED

Low energy consumption  
Small  
Light weight  
Instant on/off  
Safe  
No white light  
Lifetime of LED

Wavelength  
Heat  
Intensity  
Price

# Thank You!



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