INNOVATION

VERSATILITY

SAFE-
TY

STYLE
&
SOPHISTI
CATION

COMPETENCE

QUALITY

FACTS and FIGURES

JOKON - gives shape to light!

- Agenda
- Presentation Firma Jokon
- Source of light: From prehistory to industrial revolution
- 20th Century The modern source of energy is electricity
- 21st century The LED revolution
- Lighting in the Auto industry
- Jokon business case

FACTS and FIGURES

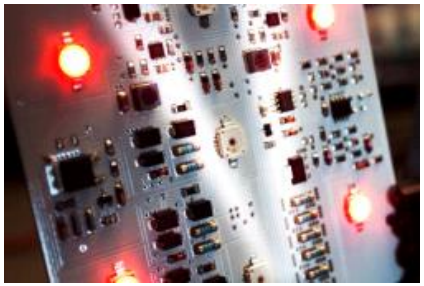
JOKON - gives shape to light!

• **Site**	D-53229 Bonn
• **Company**	Jokon GmbH
• **Geschäftführer**	Marc Laisné
• **Year of foundation**	1948
• **Employees**	140
•**Turnover 2014**	24M€

PRODUCT PORTFOLIO

JOKON - gives shape to light!

LED technology



Misc. lights

Special vehicle lights

Multifunctional lights

Reflex reflectors/accessories

Cable systems/carriers

TURNOVER DISTRIBUTION

JOKON - gives shape to light!

Trend
10 %

40 %

Trend
5 %

Trend
15 %

25 %

5 %

SITES

JOKON – brings light into shape!

Jokon GmbH D - 53229 Bonn **6800 m²**
Lighting, lighting systems

Jokon S.A.R.L.,
F - 57730 Folschviller **2400 m²**
Cables and cable sets, systems

Jokon G.B. Ltd. GB - Dorset, Poole
Sales and marketing

Source of light

From prehistory to industrial revolution

Source of light

From prehistory to industrial revolution

400 000y b.c.
FIRE
Wood
Peat (Torf)

Source of light

From prehistory to industrial revolution

20 000 y b.c.
OIL LAMP (Öllamp)

Source of light

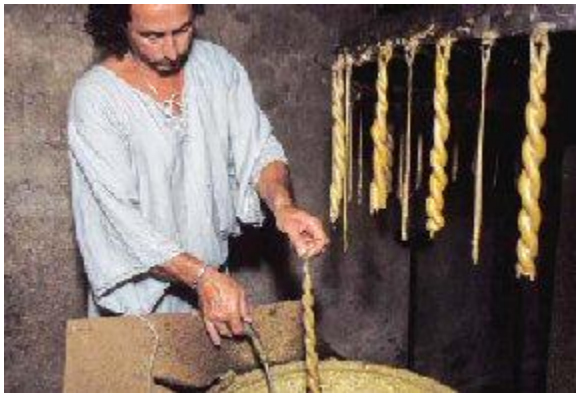
From prehistory to industrial revolution

TORCH (Fackel)

- Wood stick
- Fabric
- Animal fat

Source of light

From prehistory to industrial revolution

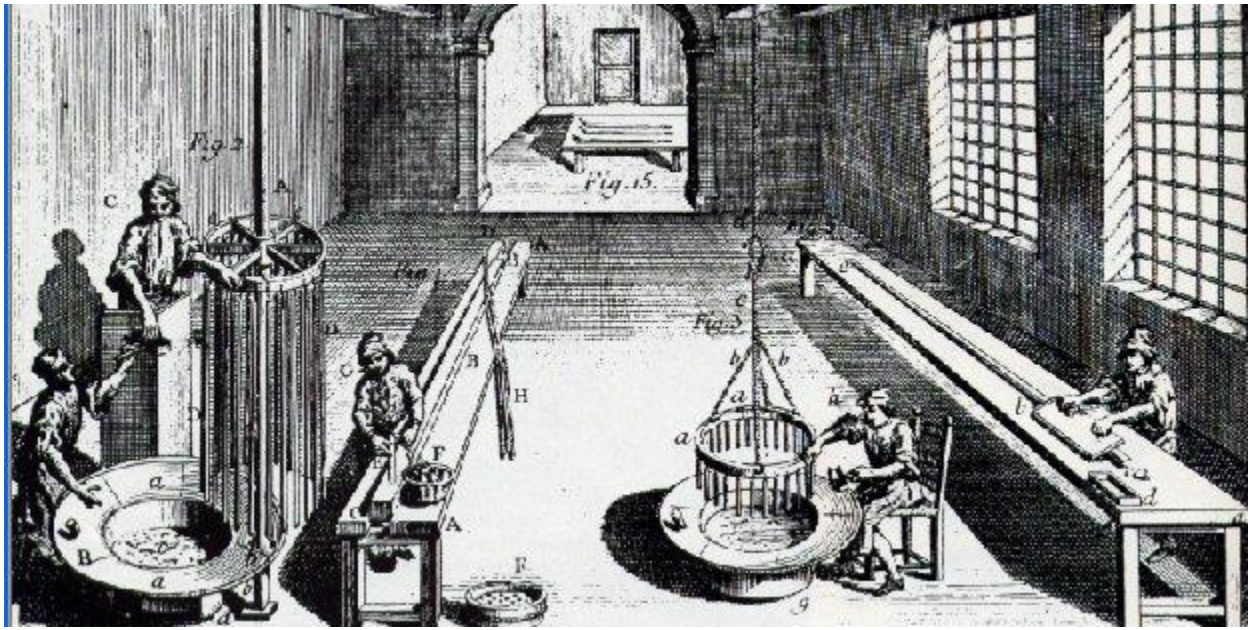


RUSH CANDLE

- Rush
- Animal or vegetable fat

Source of light

From prehistory to industrial revolution



1400
BEE WAX CANDLE

Source of light

From prehistory to industrial revolution

MODERN CANDLE

- Stearin 1831
- Paraffin 1950

- Candela= unit of measurement

Source of light

From prehistory to industrial revolution

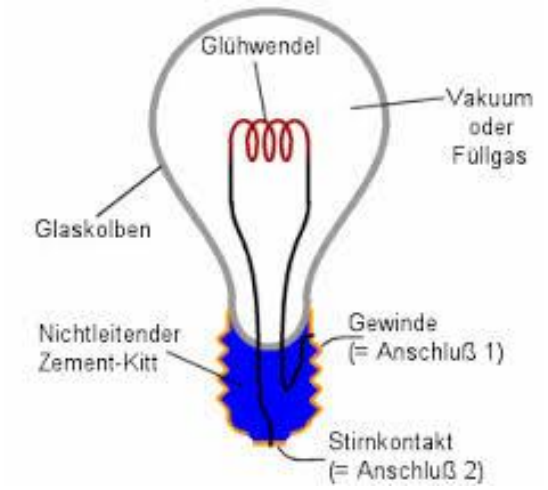
1820

Gas lighting

- London
- 1829 Paris Rue de la Paix
- …still 50 Gas lights in Bonn!

20th Century

the modern energy is electricity



MODERN TIMES: New source of energy: Electricity

Late19th century
INCANDESCENT LAMP (Glühlamp)

- Thomas Edison.
- Coiled tungsten filament heated by a current
- 2400°
- in an inert gas

20th Century
the quest for design

1959 HALOGEN LAMP

- Refinement of the incandescent lamp
- Vacume or neutral gas replaced by Halogen Gas (Iode, Brome)
- Brighter,
- More energy consumption

20th Century
the quest for design

1940
FLUORESCENT LAMP or DISCHARGE or NEON

- Electrical discharge=Lightning
- Lightning in Mercury gas generates UV light
- Phosphore coating generate glow

20th Century

the quest for design

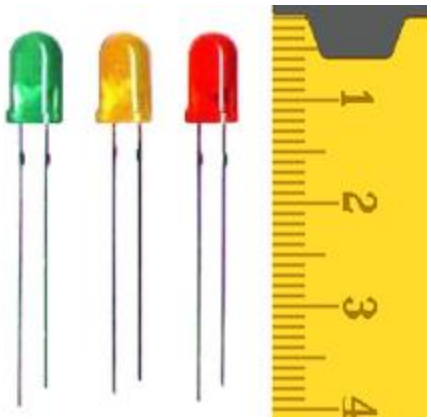
FLUOCOMPACT

20th Century
the quest for design

SODIUM VAPOR LAMP
(Natriumdampflampe)

- Fluorescent lamp in Sodium gas
- Extremely efficient
- Slow to turn on
- orange

20th Century
the quest for design



LED, the future

- Electronic component
- Photon emission as an electron crosses a silicium junction
- Principle discovered in 1907
- High efficiency

21st Century

the quest for energy saving and design

LED The Current revolution
Incandescent and Halogen are disappearing
Transition led by **design** and **energy saving**

The 2 factors of a lamp efficiency:
1. Energy efficiency: the electric power is converted into radiation but the larger part into heat (conduction and convection)
2. Luminous efficiency: only part of the radiation is perceived by the human eye

Efficiency of different light sources

= How much energy is converted into light. Visible light

	ln/w	Watts for same light
Bougie	0,03	
Incandescent lamp 100W	17,5	100
Halogen light	16	109
Fluocompact	50	35
Fluorescent tube 32 W (T8)	60	29
Tube fluorescent 32 W (T5 Eco)	114	15
white LED	100	18
Xenon light	40	44
Sodium vapor lamp low pressure	150	12
Sodium vapor lamp high pressure	190	9

LED Light

The future of lighting

Benefits of LED

•no heat

•Lifetime (20 000 to 50 000 hours); conventional incandescent lamp (1000 hours) or a halogen lamp (2000 hours), fluorescent lamps (5 000 to 70 000 hours).

•Low voltage = safety

•No inertia is almost zero.

•LED RGB (red-green-blue) limitless color variations.

Disadvantages

•Limited Power

•Complex use implying PCB

•purchase price (LED= 2 to 4 bulbs)

•But Haitz Law=

- performance x2 every 3 years
- Price /10 every 10 years

LED Light

The future of lighting

Use of LED

•Improved LED performance allows to use them to replace incandescent or fluorescent lamps,
•domestic bulbs
•Signalling status of various devices
•individual portable signaling (pedestrian, cyclist).
•Automotive Signaling
•Video Monitors
•Remote (IR LED)
•Public lighting.

LED Light

A new era in automobile

AUTOMOBILE

- Very strong development of lighting dictated by:
  - Regulation: CHMSL, DRL, SM become mandatory
  - Design: LED allows shape
- Business opportunity for traditional leaders and new comers

LED Light

A new era in automobile

AUTOMOBILE

Design possibilities offered by LED

- Homogeneous light,
- light guide,
- luminous objects,

LED Light

A new era in automobile

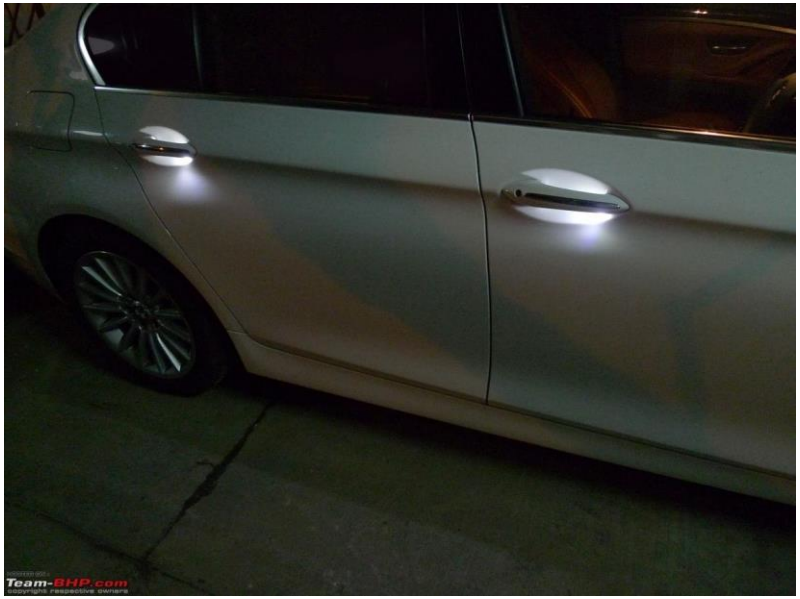
AUTOMOBILE

- Differentiation by light design: DRL and Tail are a signature.
- Brand identity
- Design Bureau Audi

LED Light

A new era in automobile

AUTOMOBILE
Ambient lighting



LED Light

An opportunity for Jokon

For Jokon
LED = 2 to 5 times more expensive, a growth opportunity

Full LED in Bus,
Camping and caravan in transition
Trailer still bulbs
Trucks front modern, rear bulb

Expertise in mechanics, injection, optics, but also in electronics