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Industrial applications using fluoride glass fibers

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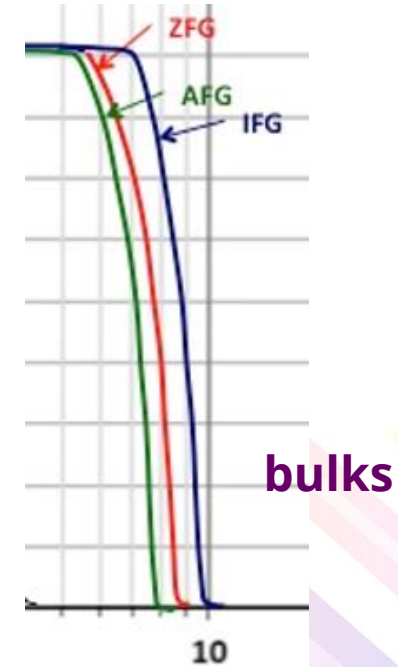
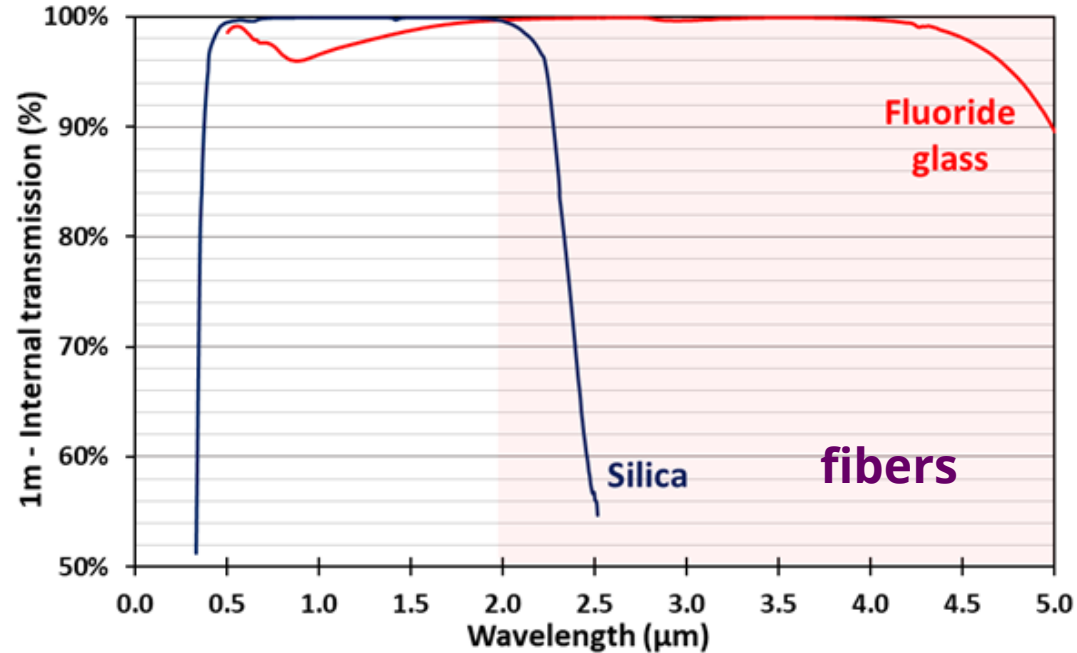
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The LVF technology: fluoride glasses

High transparency from UV to mid-IR (350 nm – 5000 nm)

World leading manufacturer of fluoride glasses, components and fibers

ZBLAN (ZFG)
InF3 (IFG)
AIF3 (AFG)
Germanate (GeG)



Many rare-earth transitions for lasers and amplifiers in the visible, the near infrared and the midinfrared (dopants: Dy, Er, Ho, Nd, Pr, Sm, Tm, Yb ,... numerous codopings, at concentration up to 10 mol. %)

Fluoride glass fibers exhibit the best transparency among all technologies in the **2000 nm – 5000 nm** range.

Past and current industrial applications

Oil & Gas spectroscopy :

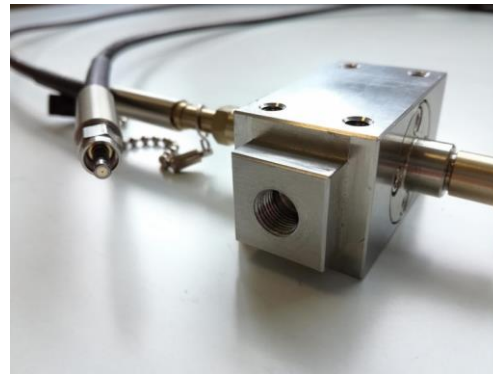
In collaboration with British Petroleum and ABB, an online spectroscopy system has been developed and is currently used in tens of refineries.

Operating wavelength : 1000 nm – 2400 nm

LVF components :

Multimode ZBLAN fiber patch cables

Flow cells



Integrator : TOPNIR Systems (France)



Past and current industrial applications

Thin film thickness sensor

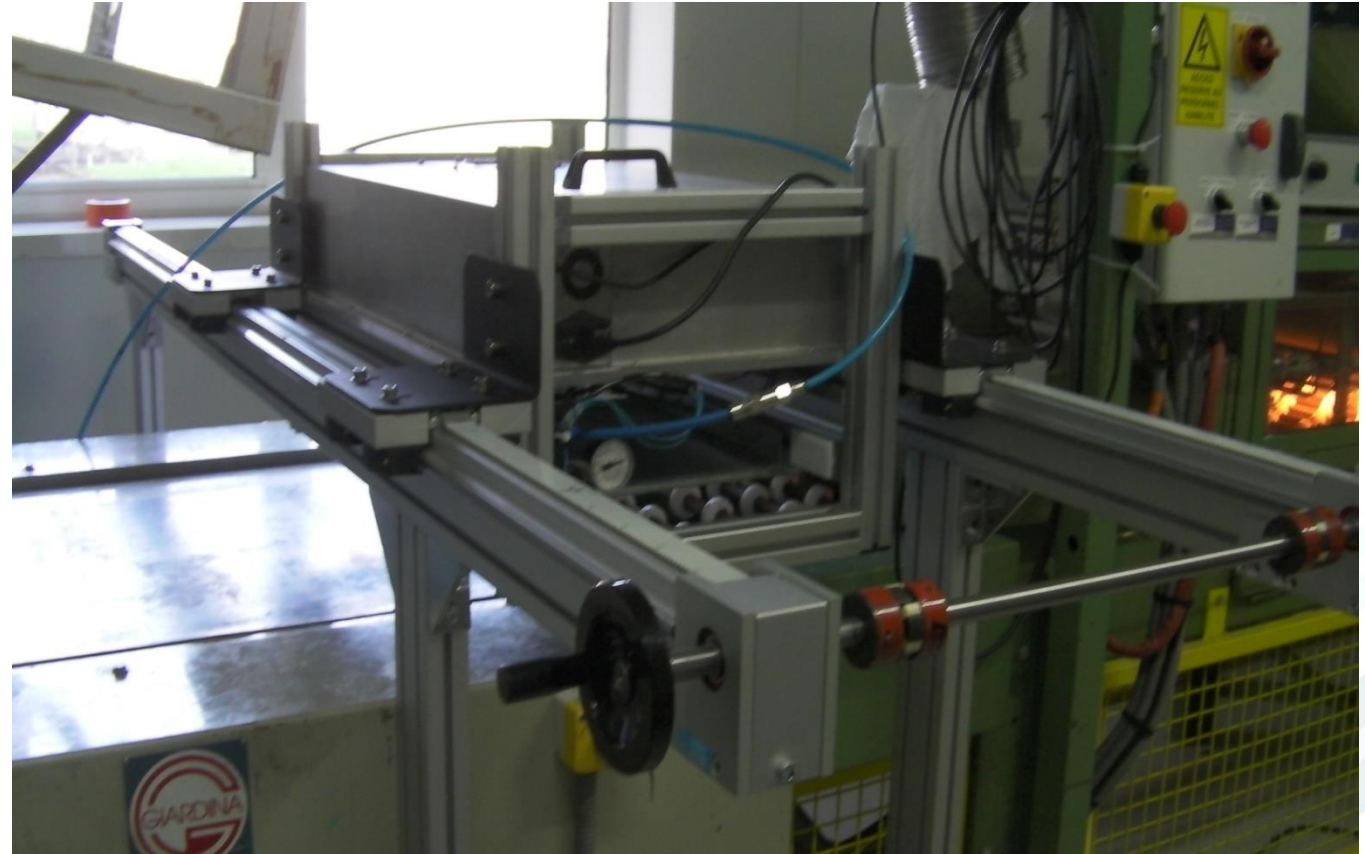
Main customer : Arcelor Mittal

Principle : by measuring wet paint using reflection spectroscopy, the system gives paint thickness after curing.

Patented solution.

Précision : < +/- 1 %

Steel ribbon speed : up to 3m/s



Industrial applications under development

Gas sensing :

LVF develops fiber solutions for pigtailed and combining of ICL and QCL up to 6 μm

Main interests :

- Easy to integrate,
- No optical adjustment, no free-space lens
- Better beam quality.

Current state of the art : from 50% to 70% injection losses

LVF objectives : from 20% to 30% injection losses

Applications :

- Industrial process monitoring
- Urban pollution monitoring

Industrial applications under development

3.3 μm fiber laser for plastic cutting and marking

The most appropriate wavelength for several plastics (high density PE, PMMA) processing is around 3.3 μm .

5W CW 3.3 μm fiber laser (made of Er doped and Dy doped fibers) is available :
LUMIR lasers 3200 series



More powerful versions are under development

Technical studies are currently led to qualify the solution for industrial uses



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**What can we do together :
Industrial partnerships to spread the
technology**