

La lettre des Syzygies

The Fluid Optics' letter

1999, March

EDITORIAL

We are pleased to present you the Syzygies' letter of spring equinox.

You will find the usual columns : the following of the comparison between the traditional reflectors and the "Fluid" ones. After the comparison with the elliptic reflectors, we go on with the parabolic reflectors.

You will also find an article about the cut light beam without occulter. This process is achieving great successes, in particular with the very competitive market. Thanks to this concept, it removes an optic and allows the use of less powerful lightsources. It also allows to decrease the light pollution due to the monuments' lighting.

At last, we present you the latest version of Khnoum, our 3D simulation software. Thanks to our new module of curve modelisation by NURBS, we can take into account the faults of a 3D measured surface.

We remind you this letter is yours, and if you want specific subject details, please do not hesitate to contact us by Email or through our Web site.

Oh! Better late than never, we wish you a very bright new year !

The Fluid Optics' inventors

THEORY

IN MOST OF CASES, THE "FLUID" CURVES ARE BETTER THAN PARABOLAS

Some theoretical studies and photometric measures have been simultaneously made. The coherence of these results proves that the "Fluid Optics" curves have, in most of cases, better yields than the parabolas have.

In this article, a comparison between a parabolic reflector and a "Fluid Optics" one is shown. In this study, a lightsource with an axial filament is used.

We have taken care of comparing similar reflectors in dimensions and in the same conditions.

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Comparison between a parabolic reflector and a "Fluid Optic" reflector.

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WHY CUTTING A BEAM TO MAKE A CUT?

A cut beam does not light over a given limit. For instance, the dimmed headlights must not send any light over a roughly horizontal line near the horizon.

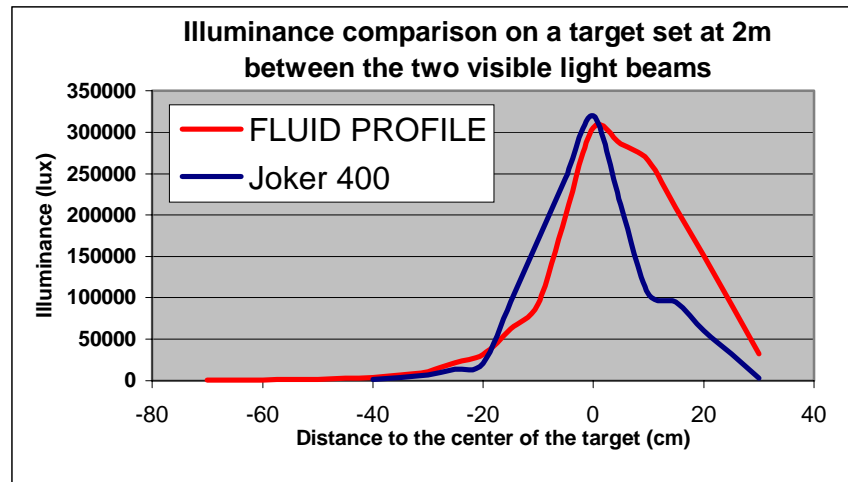
In the state of art, occulterers are used very often. They can be into the lightsource, before the outgoing glass or lens (car headlights), after the outgoing glass or lens (projectors for theater).

Applied to the reflectors' creation, the "Fluid Optics" concept allow to do a cut without occulter and to modulate the shape of a beam at will.

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THEORY

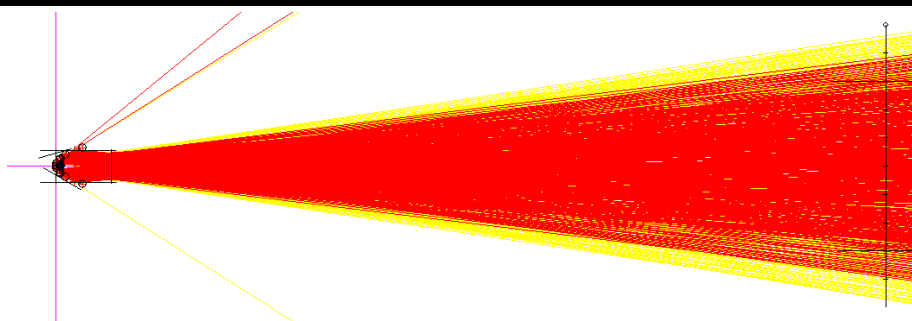
COMPARISON OF THE ENERGETIC PROFIL OF THE TWO REFLECTORS IN THE VISIBLE LIGHT



The energetic profile from the fluid optic is more important.
At half altitude, the flux widths are 19 cm for JOKER 400 and 28 cm for the fluid optic.

COMPARED PERFORMANCES

	JOKER 400 (parabola)	FLUID PROFILE
Used lightsource	PHILIPS MSR 400 HR (33 000 lm)	
Width of the beam at half height	19 cm	28 cm
Spread of the beam at half height	$\text{Arctg}(0,19/2) \Rightarrow 5,4^\circ$	$\text{Arctg}(0,28/2) \Rightarrow 7,96^\circ$
Outgoing flow	17 827 lm	26 860 lm
Peak value	320 000 lux	306 000 lux
Measured yield	54 %	81,4 %
I.E. 9 033 lm (or 50 %) of useful light more		



VIEW OF THE BEAM'S PROFILE OBTAINED BY THE FLUID REFLECTOR

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**“Fluid Optic” reflector used for the comparison.
It makes a 12 ° beam without peripheral beam.**

This reflector has a measured yield of 50% better than the state of art.

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SOFTWARES

THE NEW VERSION OF KHNOUM

Any manufacturing produces some defects which change the optical properties of the optic.

It may be interesting to estimate these modifications all the process long.

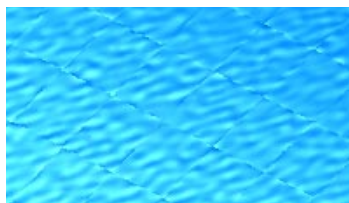
Three steps have to be particularly controlled : the 3D CAD model to the file for the machines, the manufacturing before the finishing touches (burnishing, deposits, ...), the final result.

Thanks to its new module of NURBS treatments, Khnoum is able to simulate the surfaces and their optical results.

These surfaces can come from a set of 3D measured points.

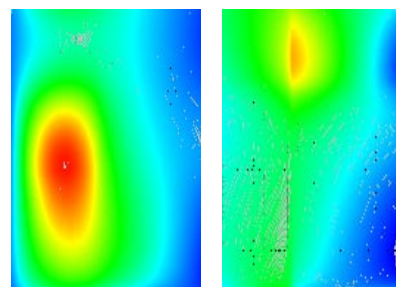


“Ideal” sample of CAD surface



Modelled surface from a set of 3D measured points

Sometimes we notice significant differences.



Comparison between two isolux views obtained from the “ideal” CAD surface (left) and the modelled surface from a set of 3D measured points (right).

This modul has been developed by the “Fluid optic” inventors. At now, it is used by many mechanical and molding companies to check the quality of their production.

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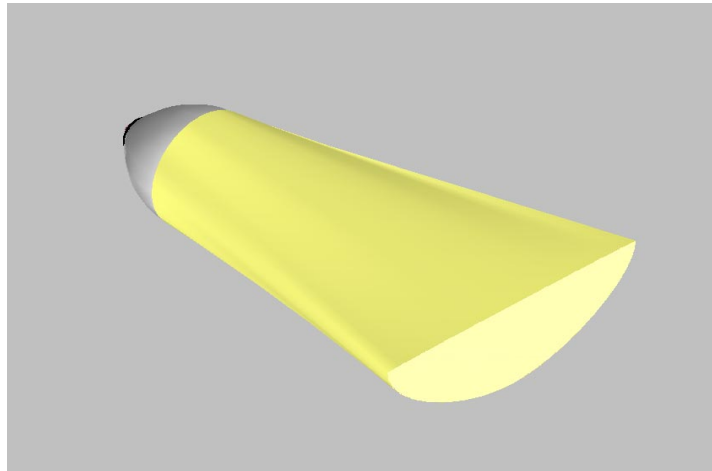
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PRODUCTS

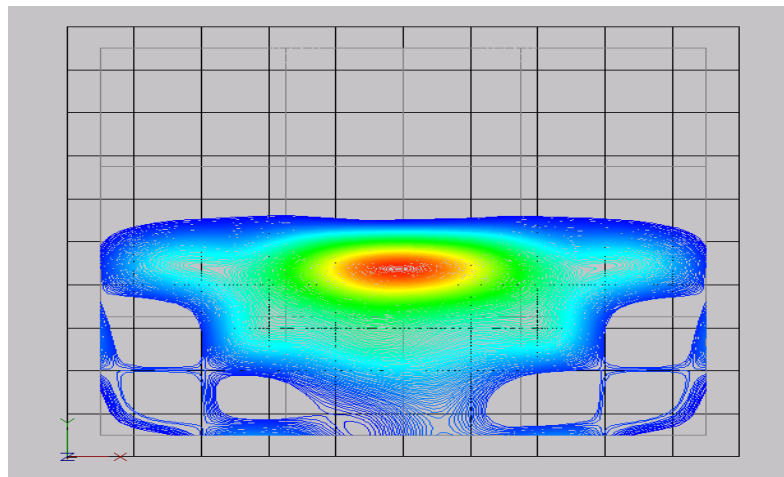
Then yield increases a lot and for the same use, a less powerful lightsource can be used.

There are many applications of this kind of reflectors. We can create a light beam with a specific shape. It can light any monument without losing any light out of it.

In the automotive industry, it becomes possible to make dimmed headlights without occulter. Our know-how allows us to make mixed projectors (full or dimmed headlights) with one or two sources without occulter, with smooth reflector and outgoing glass.



**3D simulation of a lightsource without occulter
It gives a beam with a horizontal limit.**



**Iso-rays view of a target set in front of the
reflector, perpendicular to the optical axis.**

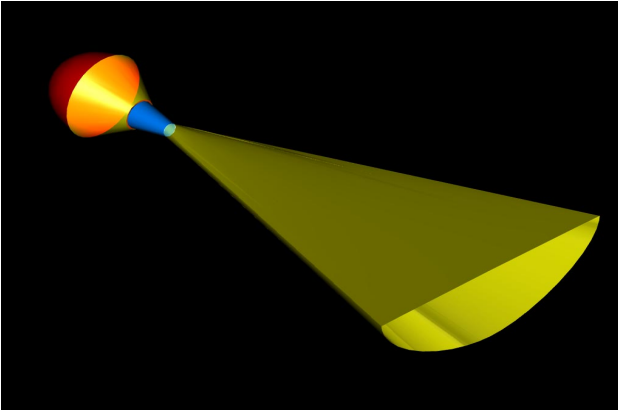
At now, we are studying specific reflectors which apply this property. These reflectors makes horizontal or vertical cut, or they makes very special beam's shapes.

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PRODUCTS

Reflectors are not the only mean to make a cut beam without occulter. It can be possible to create a cut beam by dioptric components.

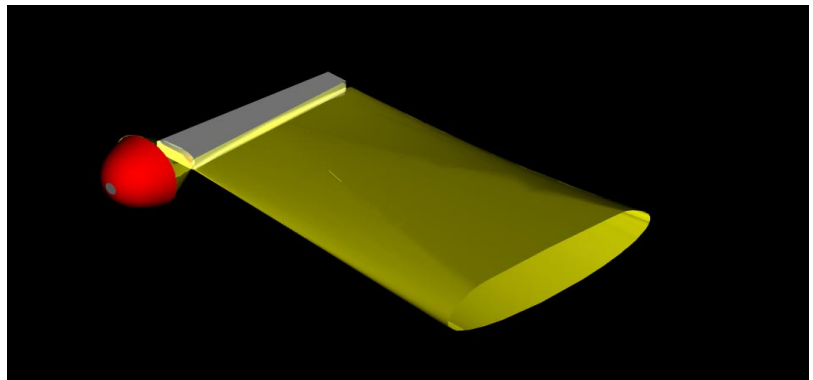


3D simulation of a reflector and a component generating an horizontal cut beam which is the same than the previous case's one .

Thanks to this set of solutions, now designers have a never reached freedom in the job. According to their wishes, we adapt the shape, the dimensions, the aspects of the projectors.

We can adapt many linear diffusers to the reflector in order to light showcases, sculptures, ...

3D simulation of a beam generated from a linear diffuser lighted by one of its ends



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NEWS

PROBLEMS OF GEOMETRY

We did not have any new propositions to the problem proposed on our web server :

<http://home.worldnet.fr/of>

This problem is essential to understand one of the way we use to create an optic that generate a reflected or refracted light beam in a given direction.

NEXT SUBJECTS

The following subjects will be tackled in the next issue :

- ⇒ Fluid dioptric,
- ⇒ The "Fluid optics" and the museology,
- ⇒ The newest versions of our softwares.

⇒ If you would like us to treat any subject, please send us a message, at our email address :

of@worldnet.fr

You can also contact MEGALUX, the firm in charge of the exploitation of the Fluid Optics at :

info@megalux.com

NEXT LETTER

You will receive the next Sysygies' letter for the summer solstice (mid-june).

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