



ZOOM ON...



BINOCULAR
PHASE
CONTINUITY

35 CM
UP TO
∞

WHY A NEW CONCEPT ?

In modern life, intermediate and near visions are constantly solicited and not only for reading of different supports. The multiplication of the signals that surround us requires flawless visual acuity in all circumstances. The evolution of driving aids particularly illustrates this need : to see far away of course, but also and simultaneously, to read nearby road signs and consult the GPS.

Today a person operated for a cataract does not regain sharp and continuous vision. In the best case, he/she will see clearly at a long distance and at one or two specific shorter distances (at 40 and/or 70 cm).

WHAT IF WE COULD RESTORE SHARP AND CONTINUOUS VISION TO CATARACT PATIENTS?
WHAT IF WE COULD IMAGINE A DAILY LIFE SPECTACLE-FREE AFTER LENS SURGERY ?

Either with presbyopia or after their cataract surgery, patient visual needs require CONTINUITY OF VISION and INSTANT ADAPTATION to multiple visual tasks, at varying distances.

This is the SYMBIOSE's promise!



=



MID

+



PLUS

Cristalens is revolutionizing IOLs using **BINOCULAR PHASE CONTINUITY TECHNOLOGY**

based on two technical specificities:

- **BINOCULAR COMPLEMENTARITY**
- **CONTINUOUS PHASE**

1 WHY "BINOCULARITY"?

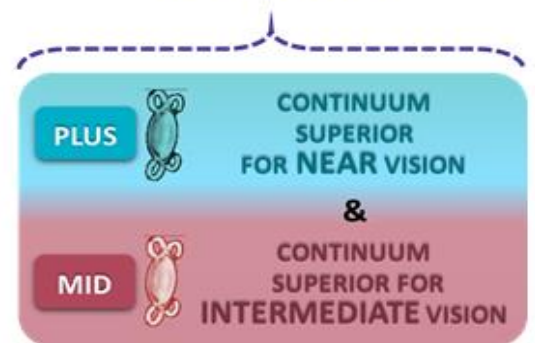
Cristalens developed the first pair of differentiated complementary IOLs: **ARTIS SYMBIOSE® MID & PLUS**.

This complementarity optimizes contrast distribution for binocular vision. The two different IOLs (Symbiose Mid & Plus), with distinct and optimized energy peaks, are implanted in each eye of the patient. Such complementary association improves visual acuity in binocular vision.

The **two different IOLs** positively associate their respective and complementary properties.

- **MID IOL**: a large FTM continuum from intermediate vision down to close vision offering **greater contrast for intermediate vision**.
- **PLUS IOL**: a large continuum offering **superior contrast for near vision**.

BINOCULARITY



See complementary MTFs template on page 8

ARTIS SYMBIOSE® is the only product that incorporates the **BINOCULAR PHASE CONTINUITY** technology which provides **SHARP & CONTINUOUS VISION OVER 35 CM TO 90 CM & DISTANCE VISION**.

OUR MOST EFFECTIVE RESPONSE TO MARKET REQUIREMENTS

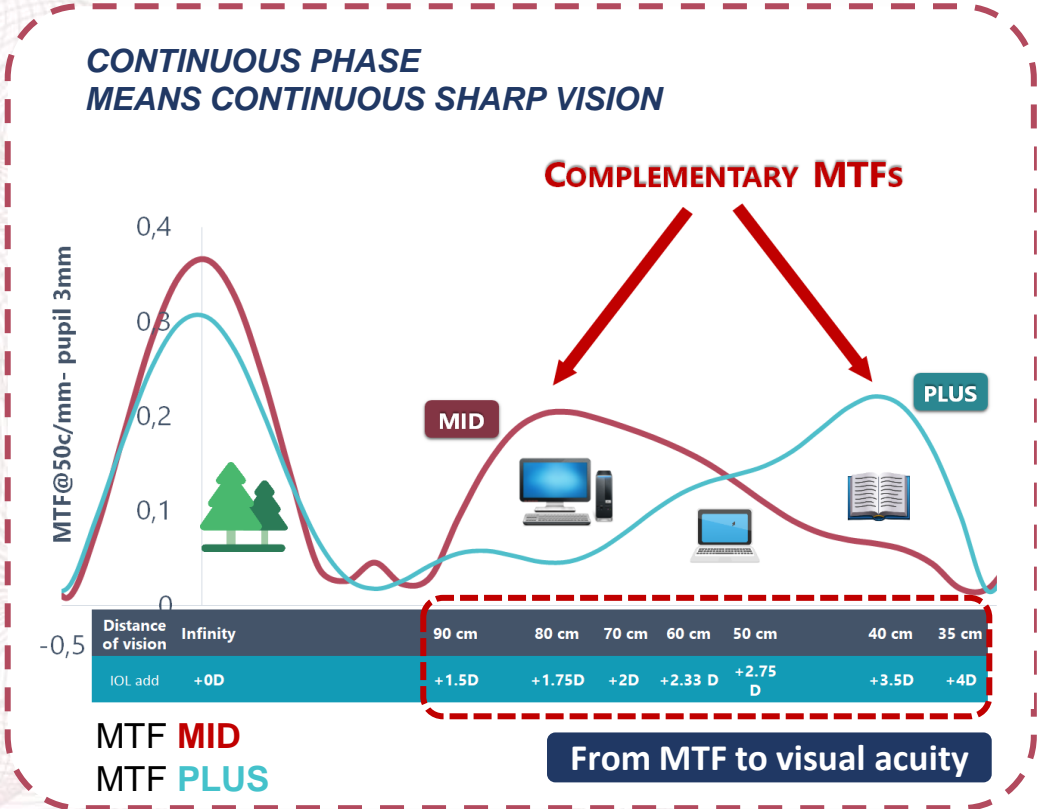


3 HOW CAN WE EXPLAIN AND ILLUSTRATE VISION QUALITY WITH “**CONTINUOUS**” PHASE?

Binocular simulations with a pair of differentiated combined ARTIS SYMBIOSE® MID & PLUS IOLs predict **continuous** clear vision from 35cm up to infinity with no compromise for neither intermediate nor far vision.

**MTFs ADDITION
is CONTINUOUS
from +1.5D
up to +3.75D**

**PERFECTLY
CLEAR VISION
FROM 35CM UP
TO INFINITY**



distance	EDOF	TRIFOCAL	SYMBIOSE
5 m	EDOF	TRIFOCAL	SYMBIOSE
80 cm	EDOF	TRIFOCAL	SYMBIOSE
70 cm	EDOF	TRIFOCAL	SYMBIOSE
60 cm	EDOF	TRIFOCAL	SYMBIOSE
50 cm	EDOF	TRIFOCAL	SYMBIOSE
40 cm	EDOF	TRIFOCAL	SYMBIOSE
37 cm	EDOF	TRIFOCAL	SYMBIOSE

**ARTIS SYMBIOSE
Binocular Vision**

**CONTINUOUS
NEAR AND
INTERMEDIATE
SHARP VISION
OVER 35 TO 90 CM
& DISTANCE VISION**

Extract from Cristalens Artis Symbiose brochure, ref: 1016_EN v.1.0



2 WHAT IS “**PHASE**”? WHY IS IT SO IMPORTANT?

Multifocal IOLs, even trifocal, typically generate what is called “phase inversion”, at some distance either near or intermediate. This means the image is not sharp at these specific distances.

PHASE CONTINUITY technology, however, is an optimised optical profile that avoids any phase inversion, thus providing extended sharp vision.

Diffractive ocular implant with enlarged near vision” patent filed on 17/09/2019 – to be published

In detail...

An IOL’s optical quality is determined by the **PSF (*)**.

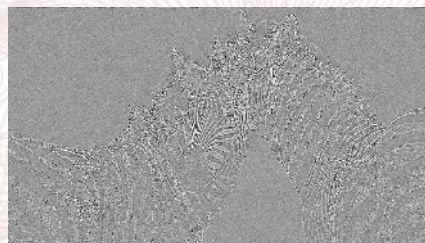
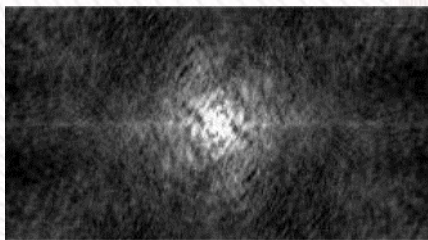
PSF is converted to get the **OTF (**)** which indicates optical system influence on light energy distribution into the image space.

FTO itself is split into:

- **MTF (***)**, function which evaluates the magnitude of **variations in the contrast restitution** (measure from 0% up to 100%)
- **PTF (****)**, function which characterises eventual “**phase lags**” (lack of “**resolution**” or “**image sharpness**”) involved by IOL.

It is essential to consider curve variations and to identify phase “inversions” which indicate that the image coming through the implant is not sharp at this distance. For perfectly clear vision, sharp whatever the distance, implants must provide **PHASE CONTINUITY**.

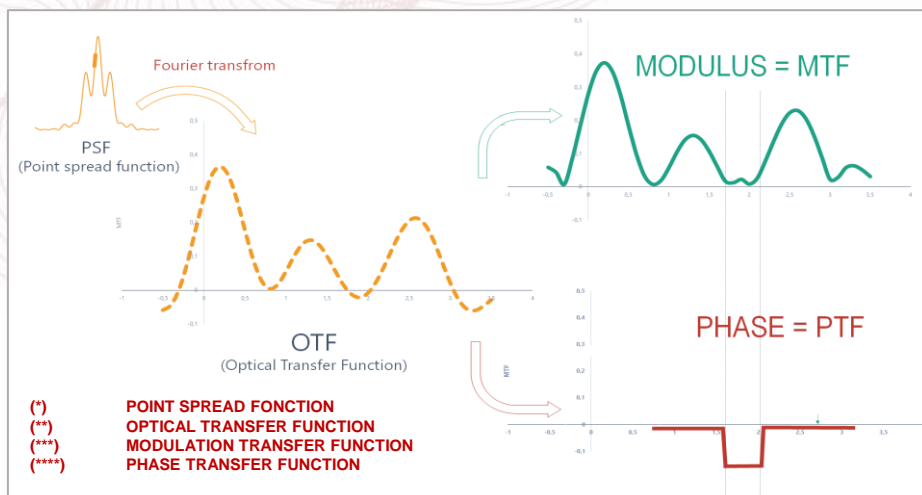
MAGNITUDE and PHASE characterise an IMAGE...



MAGNITUDE = CONTRAST

PHASE = CONTOUR SHARPNESS

IMAGE



It is essential to consider curve variations and to identify phase “inversions”

“After the trifocal revolution that has democratized the market for “premium” implants Artis Symbiose[®] comes at the right time and with the right arguments”

Other multifocal IOLs require surgeons to spend time with the patient, before surgery to define targeted vision areas and after surgery to support his/her adaptation to viewing distances. With Artis Symbiose[®], this is not the case anymore!