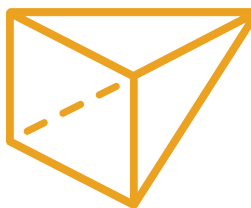




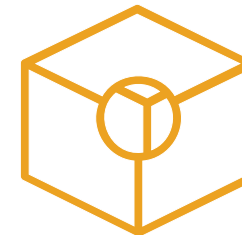
Genuine image depth

offers extended usage without eye-strain or nausea.



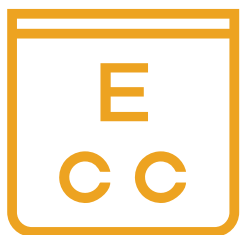
Continuous focus

allows users to focus correctly on virtual objects at any distance, enhancing user interaction.



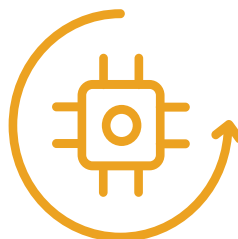
High spatial resolution

offers a truly immersive experience with retinal resolution imagery.



Adaptive prescription

offers users a tailor-made experience matching their visual needs.




Computational efficiency

allows real-time light-field rendering on mobile platform.



No eye-tracking required

enables a simple and robust system architecture.

	Digital light-field (sequential) 	Holography	Classical light-field (spatial)	Multiple depth planes	Varifocal element
Genuine image depth	Yes	Yes	Yes	No	No
Continuous focus (planes)	Unlimited ¹	Unlimited ¹	> 10	2 - 4	> 100
Spatial resolution	High	Medium	Low ²	High	High
Adaptive prescription	Yes	Yes	Yes ³	Only SHY	Only SHY
Computational efficiency	High	Very low	Medium ⁴	High	High
Eye-tracking required	No	No	No	No	Yes
Hardware complexity	Low	High	Medium	Low	Low

¹ Resolution is finite, however much higher than an eye can resolve

² To achieve high spatial resolution would require HD microdisplay (8K and above)

³ Only in small range

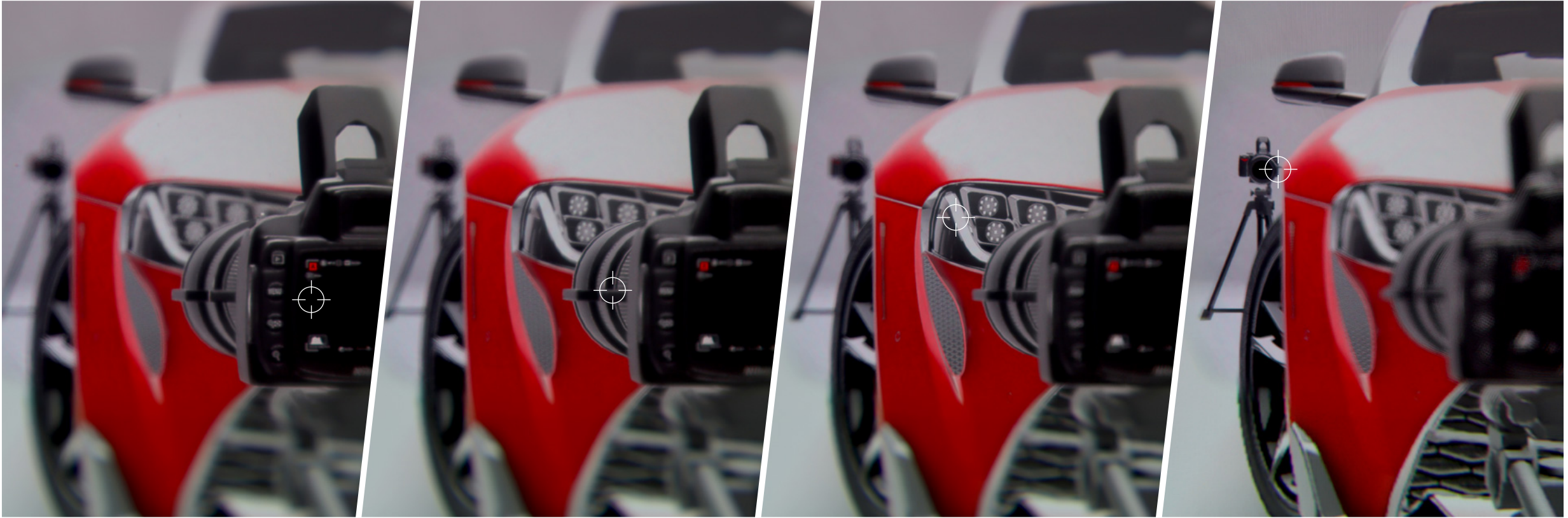
⁴ Computational efficiency is usually limited by the image data transfer bandwidth

Per eye	Today (demo available)	Target 2024
Depth resolution (planes)	Continuous	Continuous
Angular resolution at infinity	40 px/° light-field	40 px/° light-field
Modulator resolution	Light-field: 1 Mpix Periphery: 1600×1440 px	Light-field: 1 Mpix Periphery: 1600×1440 px
FoV (diagonal)	100° (Light-field: 36°)	100° (Light-field: 36°, possibly movable)
Effective eyebox (exit pupil)	13 mm (7 mm)	> 13 mm (7 mm)
Eye relief	17 ± 3 mm	17 ± 3 mm
Colors	5-10 M	5-10 M
GPU load	FHD (equivalent)	FHD (equivalent)
Frame rate	160 - 240 Hz	up to 180 Hz
Sub-frame rate	3.8 - 7.6 kHz	up to 8.0 kHz
Spatial tracking	Intel RealSense T265	Custom
Hand-tracking	Ultraleap	Custom
Eye tracking ¹	Pupil Labs	Custom

¹ Eye-tracking is not required for the essential function





Focus

0.2 M

Focus

0.3 M

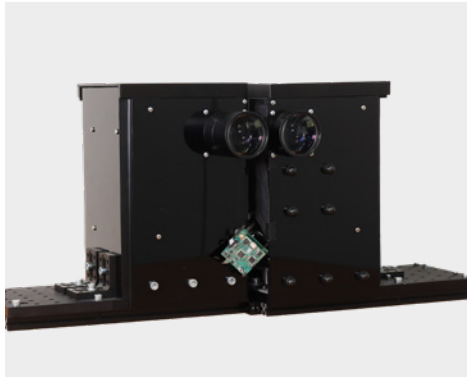
Focus

0.6 M

Focus

3 M

Q1 2020



Q1 2021



Q1 2022



2024



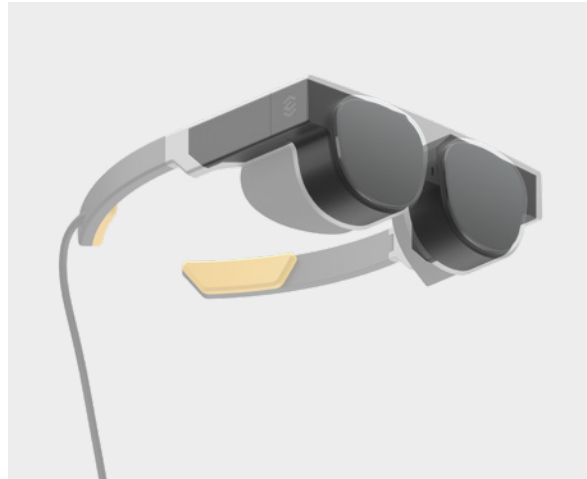
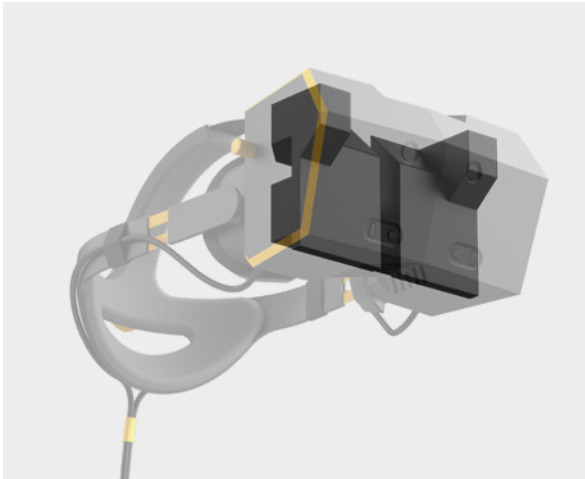
2025+



Q1 2022

2024

2025+



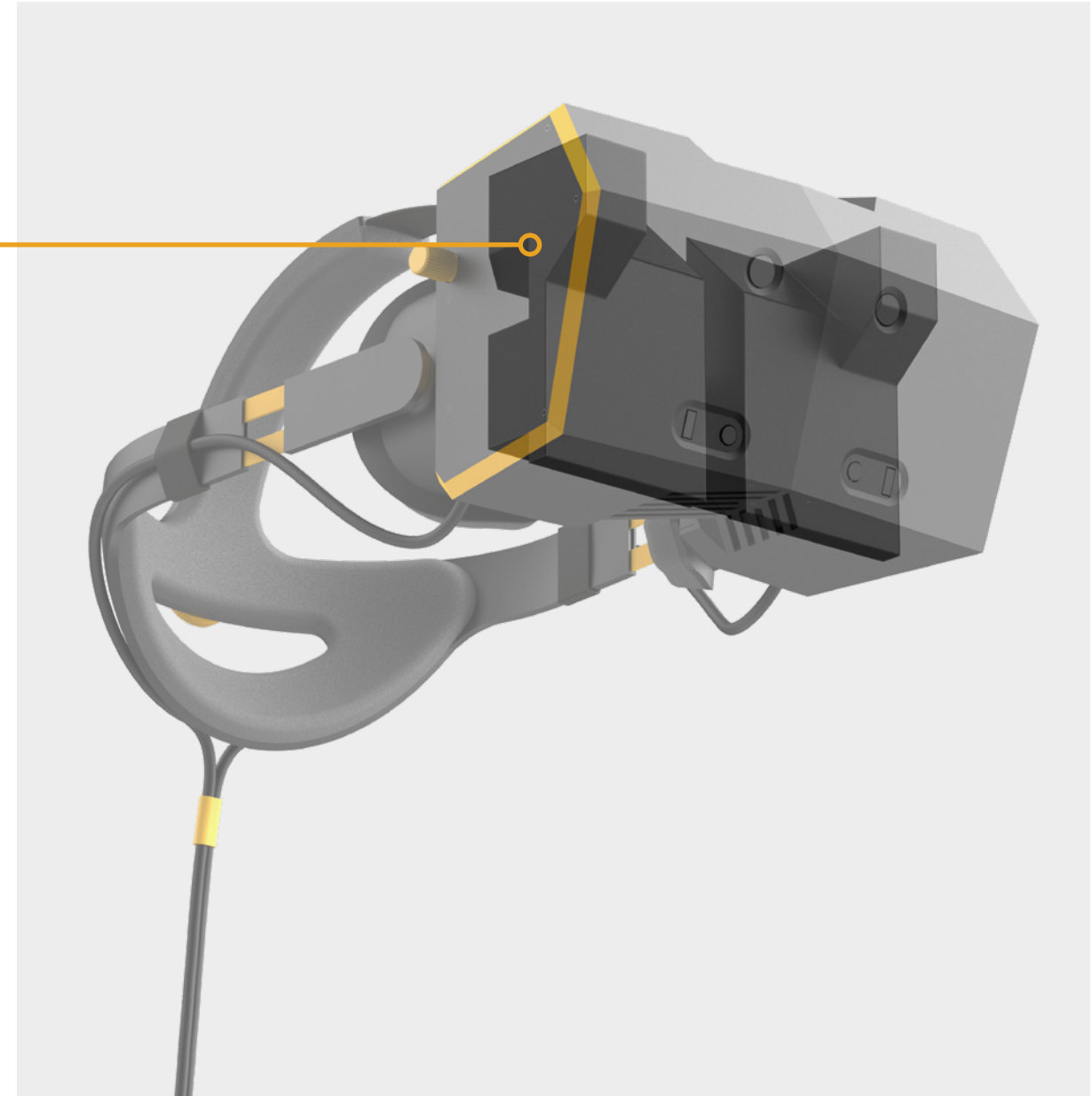
Full evaluation kit and optical engine available today

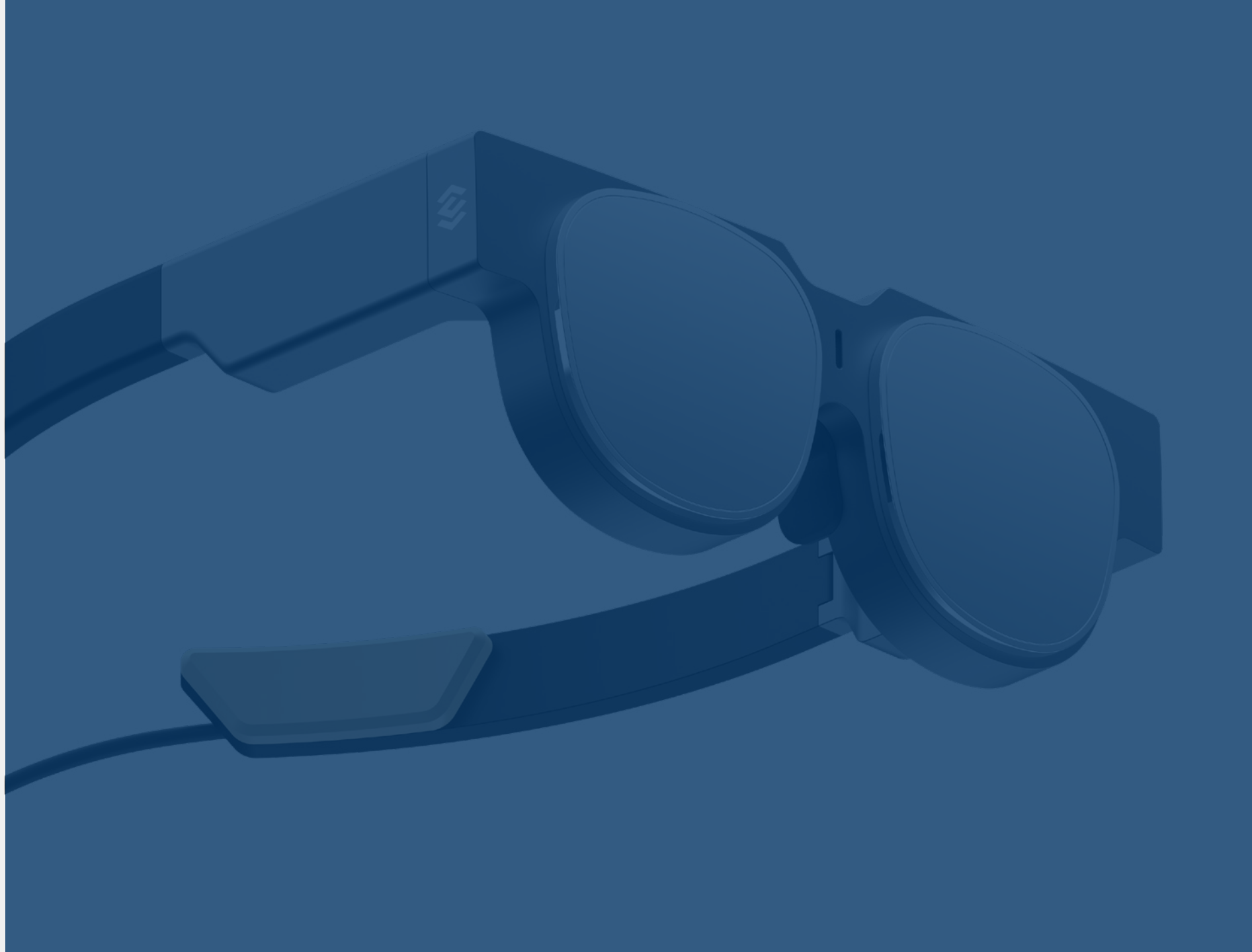
- + Complete light-field optical engine
- + Foveated light-field “addon” to integrate with your existing back screen

Light-field can help you to build **the ultimate VR headset where the virtual looks just like real.**

Please ask us at sales@creal.com for:

- 1 VR technology evaluation kits
- 2 Engineering and integration support





CREAL.com |
contact@creal.com |
EPFL Innovation Park, Switzerland