# **TENTAC RFID Tag** for eyewear

## Launching the Sale of RFID Tags for Eyewear, Achieving Improved Reading Efficiency!

Many eyeglass frames are made of metal, which can interfere with RFID reading. To address this issue, we have developed an RFID tag that uses a technology designed to amplify radio waves by placing the antenna in close proximity to metal components, such as the temples.

By utilizing a flag-type inlay developed for compatibility with metal surfaces, such as aluminum beverage cans, we have created a technology where the proximity of the antenna to the metal frame allows the frame's metal components to act as part of the antenna. This amplifies radio waves, significantly enhancing reading accuracy.

For eyewear frames, we have developed a new "RFID Tag for Glasses" (patent granted) with careful consideration of optimal inlay placement, ease of attachment, and aesthetic balance. Sales began in June 2024.



### **Performance Verification**

#### Test Details

The test involves attaching the "RFID Tag for Glasses" to the product and verifying whether it can be read without opening the case, such as a dozen box or carton.

### Product Details

Eyeglass frames (a mix of metal and cellulose acetate products), 200 pieces per case.

### Test Method

Read the product with an RFID handheld reader (1W type) while it is inside the case or carton.

Can all items be read? How long does it take to read them? For comparison, we also conducted testing with a standard RFID tag of the same size from our company.

## **Reading Test Results**

## Standard RFID Tag of the Same Size from Our Company

	1st Test	2st Test	3st Test	
Reading Time	1 minute 40 seconds	1 minute 52 seconds	2 minute 30 seconds (4 pieces remaining)	

It took just under 2 minutes to read all the items, and in the third test, not all items were readable. This is believed to be due to the impact of reflection waves caused by the metal.

### RFID Tag for Eyewear

	1st Test	2st Test	3st Test	4st Test	5st Test
Reading Time	3 seconds	5 seconds	2 seconds	1 seconds	4 seconds

Five reading tests were conducted, and all items were read in just a few seconds.



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## Patent Granted



## The impact of metal, such as metal frames,

Conventional UHF RFID systems are highly influenced by metal. The primary cause of this interference is the reflection waves generated by metal, which disrupt the RFID signal. Based on our experience, the impact of metal parts on reading accuracy has been a concern in the eyewear industry when adopting RFID technology.

By using metal-compatible RFID tags, we aimed to leverage the amplification effect of radio waves caused by the metal components of the frame. The result was a noticeable improvement in performance. Although frames without any metal were mixed in this test, the reading performance was almost identical to that of metal frames.

## The benefit of being able to read at the carton level

In retail displays, eyewear frames are often presented individually, which minimizes the issue of metal-induced interference as mentioned above. However, in logistics and store operations, cartons containing a certain number of frames are typically stored in warehouses or the store's backroom. For bulk "inbound/outbound" and "inventory" processes, reading RFID tags is necessary.

Developed with the goal of reliably reading cartons containing hundreds of units, this test yielded positive results. For large-scale inbound and outbound shipments with overseas partners, the cartons can simply be passed through tunnel gate-type readers, allowing for a quick inspection of incoming goods—about 10 seconds per carton.

