Works with Google Cardboard Manufacturer's Kit
Guidelines and Best Practices

Introduction

"Works with Google Cardboard" Program has been designed to indicate to users that a given virtual reality viewer has been certified by the manufacturer to meet Google standards, and works well with thousands of applications made for the Google Cardboard ecosystem.

This document describes the best practices and lessons for manufacturing virtual reality viewers that work well with Google Cardboard ecosystem. It includes component specifications, print instructions, parts to avoid, common caveats and so on. It is accompanied by a set of die-cutting, laser-cutting and scissor-cutting templates for Google Cardboard inspired viewers. These templates can be found in the manufacturing template collection (wwgc_manufacturers_kit_v1.2.zip).

If you have any questions or comments about the WWGC Program, contact us at wwgc@google.com.

Google Cardboard Templates

The manufacturing template collection (wwgc_manufacturers_kit_v1.2.zip) for Google Cardboard-inspired devices contains the following items:

- Die-cutting template for Google Cardboard. If produced using this template, Google Cardboard can be folded together into a shipping-ready envelope (8.3" x 6.72" x 0.69"). This template also includes the Cardboard assembly artwork.

- Laser-cutting template for Google Cardboard. This template is to-scale, but it does not include artwork. It is best suited for prototyping and manufacturing a handful of units.

- Scissor-cutting template. This template enables you to print the outlines of Google Cardboard onto three US letter-sized pages, glue them to a piece of cardboard and cut it out using scissors or an X-Acto knife. This template is best for creative prototyping.

- Lens specification as used in Google Cardboard.
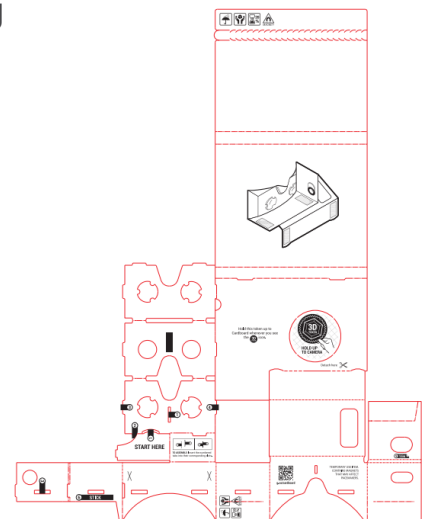
Parts

Enclosure

- If you're using cardboard for the viewer's enclosure, use the corrugated E-flute cardboard sheets. Flute thickness should not be less than 0.06" (1.5mm), otherwise the viewer itself will become unstable. This typically manifests in bending when opening/closing the top flap.

- For Cardboard envelope assembly (best for die-cutting), use at least 24" x 30" sheets.

- For the standalone Cardboard assembly (best for laser printing individual prototypes), use at least 8.75" x 22" sheets.

- If you're using cardboard for the lens plate, apply stickers or food grade varnish to the cardboard to minimize unattractive staining on it, since it will be in frequent contact with skin.

- Other materials can be used for the viewer's enclosure, including plastic, foam, aluminum, etc.

- Enclosure is optional: lightweight forms of VR viewers (which do not necessarily block all ambient light) also work well with Google Cardboard ecosystem.

Lenses

- Google Cardboard uses 45mm focal distance, asymmetric biconvex lenses. This type of lenses works best to prevent distortion around the edges. The exact specification of these lenses can be found in wwgc_manufacturers_kit_v1.2.zip template collection.

- Viewers with custom lenses are fully compatible with the Google Cardboard ecosystem. If you're designing custom lenses, aim for wide eyebox and avoid a mechanical inter-lens/IPD adjustment if possible.

- Make sure to create a viewer profile to correct for lens barrel/pincushion distortion using the Viewer Profile Generator as described in "Viewer profile" section below.
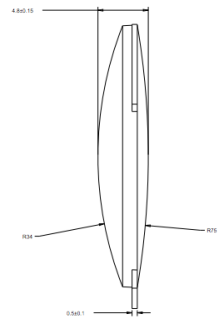
Inputs

- If your viewer is using a magnet based input, use a neodymium ring magnet (at least NH35 grade) as an outside trigger. Google Cardboard ring magnet's dimensions are 0.740" x 0.105".

- Similarly, use a ceramic disk magnet with at least C8 grade for Cardboard inside. Ceramic magnet's dimensions are 0.701" x 0.197". Make sure to glue the ceramic disk magnet in place, otherwise the whole magnet pair could come off easily and become a swallowing risk.

- You can also use different types of inputs, from a simple smartphone screen touch, to Bluetooth-based buttons, various types of conductive and capacitive inputs, and so on.

- Make sure that your viewer contains exactly one input. If your viewer uses the screen touch, ensure that there is at most one dedicated area for touching the screen.

NFC tag

- The use of the NFC tag is optional. If you choose to include the NFC tag with your viewer, encode it with the viewer profile URL from the Viewer Profile Generator. This URL should start with the "`http://google.com/cardboard/cfg?p=`" prefix.

- The NFC tag should contain no other entries, apart from the viewer profile URL. For the best user experience, it should not have an embedded Android Application Record (AAR) that auto-launches an app.

- Place the NFC tag on the side or bottom of the viewer. Do not place the tag inside the viewer flap, as some phones may not be able to handle the tag in this location.

Parts to avoid

Do not include a headstrap with your viewer. When the user holds the Cardboard with their hands against the face, their head rotation speed is limited by the torso rotational speed (which is much slower than the neck rotational speed). This reduces the chance of "VR sickness" caused by rendering/IMU latency and increases the immersiveness in VR.

## Miscellaneous Google Cardboard parts (Velcro, stickers, rubber band, print)

- Google Cardboard uses two strips of regular-strength, adhesive-backed velcro. Approximate size is: 0.75" x 1.25" (20mm x 30mm). Make sure that the adhesive is sufficiently strong to not loosen from the cardboard top over time, as the strips will be getting a lot of use.

- Similarly, make sure to use a strong adhesive sticker on the magnet side. This is what holds the whole assembly together, and it tends to loosen over time.

- Use the rubber band to prevent the phone from sliding out. It is enough for the rubber band to be wrapped around the bottom of the viewer and touch the bottom of the phone - it does not need to be wrapped around the box.

- If you print assembly instructions on both sides of the cardboard, avoid designs that require perfect alignment on both sides.

- Leave sufficient margins (1/4" - 1/8") between the print patterns and the die-cut lines.

Viewer profile

To ensure that all apps in the Google Cardboard app ecosystem work great on your viewer, create a QR viewer profile for your device using the [Viewer Profile Generator](). Here is the typical output of the this tool:
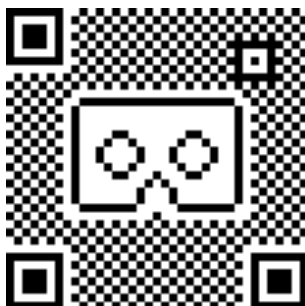
Place this QR profile on your viewer (recommended), as well as on the viewer's packaging, and/or on its website. You can find the detailed guidelines for sizing, spacing and other details of the generated QR profile here.

Usage Guidelines for WWGC Devices

Audiences

- Refrain from promoting and recommending Cardboard-like viewers to kids without conducting additional testing.

- If you include magnets, retain the messaging that the viewer contains magnets that may affect pacemakers.

- If your viewer is made out of cardboard, make sure that your audiences understand the limitations of the material: not water-resistant, potentially combustible (especially if lenses are facing a strong light source), limited life span.

Brand Use

Naming

- Do not use "Google Cardboard" or any similar name for your products, your domain name, your website, social media handles, or business, that makes your product look like an official Google product.

- Do not file trademark applications or otherwise claim trademark rights in any marks that are confusingly similar to Google's trademarks, including GOOGLE and GOOGLE CARDBOARD.

- Do not use any Google or Google Cardboard graphical assets (logos, product icons, etc) on your website, your physical products or in packaging without express, written authorization from Google.

Referring to Google Cardboard

- You are allowed to use any of the following approved text on your website or printed materials to refer to Google Cardboard:

  - This [XYZ VR headset] was inspired by Google Cardboard.

  - Inspired by Google Cardboard

- If you use any of the above approved text to refer to Google or Google Cardboard, you must include an attribution statement on your website that states "Google Cardboard is a trademark of Google Inc."

Other communications, media, and press

Do not overstate your relationship with Google: do not state or imply that you are an exclusive partner with Google. Do not suggest or imply that you have an exclusive or privileged arrangement with Google that differs from any other manufacturer.

Do not speak on behalf of Google, its representatives or products. You are welcome to conduct your own interviews and provide statements about your organization's specific product. However, please do not speak on behalf of Google or speculate about any Google initiatives. We're happy to take any questions from the press that are about Google as a company, Google's strategy, or the ins and outs of a Google product. Simply direct inquiries to press@google.com.

Applying to WWGC Program

1. Fill out the form at http://g.co/joinwwgc.

2. Send two (2) representative samples of each candidate viewer stock keeping unit (SKU) so that Google may evaluate them.

The samples should be sent to:

WWGC Program
1600 Amphitheatre Parkway
Mountain View, CA 94043

You are responsible for all costs associated with delivering the samples to Google. Google may keep the devices and is not required to return them to you.

Disclaimer

Google provides these guidelines in an effort to help manufacturers provide a quality VR user experience. Google, however, does not make any warrants or representations, does not accept any liability, and will not indemnify any manufacturers for these designs or for third-party viewers generally.

Change Log

Version	Date	Change description
1.2	04/16/2015	Added information about the "Works with Google Cardboard" Program.
1.1	12/10/2014	Initial manufacturing guidelines for Google Cardboard v1.1