United States
Consumer Product Safety Commission

MEETING LOG

SUBJECT: UL 8400 Task Group Meeting on Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) Technology Equipment

FY 23 OP PLAN ENTRY: Wearables

DATE OF MEETING: 09/06/2023

LOCATION OF MEETING: Virtual

CPSC STAFF FILING MEETING LOG: Treye Thomas (EXHR)

FILING DATE: 09/12/2023

CPSC ATTENDEE(S): Treye Thomas (EXHR) and Stephen Harsanyi (ESHF)

NON-CPSC ATTENDEE(S): Contact ULSE for attendee list.

Summary of Meeting:
Members of the Technical Committee (TC) for the UL 8400, *Standard for Safety, Virtual Reality, Augmented Reality and Mixed Reality Technology Equipment,* met in four consecutive task groups. The task groups pertain to the following topics for immersive technologies: Age Requirements, General Requirements, IEC 62368 Alignment, Transmittance, and Biomechanical Stress.

1. Age Requirements: Task group members discussed the current user age limit of 12 years or older for products subject to UL 8400. Several members stated that there is not enough evidence to change the age requirements at this time and that more research needs to be conducted, particularly for the use of immersive technologies by pediatric populations. One member opined that manufacturers should decide appropriate ages for their products. Members requested the rationale for setting the current limit to 12 years or older. CPSC staff provided an overview of the TC's previous rationale for the current age limit, and emphasized staff's concerns for potential harm to the visual, neurological, and musculoskeletal systems of vulnerable populations, as well as psychological distress. Staff also voiced concern about the use of immersive technologies by ages permitted by the standard, as well as children under the age of 12. The task group discussed the extent to which UL 8400 can and should address software for immersive technologies, and the members were divided in their opinions. These issues involved a risk-based approach where clearly identifying the use scenario (*e.g.*, active gaming vs stationary educational applications) is critical to characterizing the potential health risks.

2. General Requirements and IEC 62368 Alignment: Task group members discussed safe functioning of immersive technologies and how to strengthen and clarify the required failure modes and effects analysis. Specifically, how and whether to clarify the hazard type, the hazard level, usage (normal, abnormal, and single fault), target user (ordinary, instructed, or skilled), and test parameters (procedure, pass/fail criteria, etc.). One member mentioned that it is unclear as worded to what extent a product that is modified and/or

damaged by a user would need to remain safe after the required testing. CPSC staff acknowledged the concern and supported adding clarity to the section.
A member from UL who has experience testing to UL 8400 commented on the process of testing to the standard. The member explained that the test procedures are likely to vary from lab-to-lab as to how they test to the acceptance criteria, as the test conditions will be dependent on the specific lab's equipment, expertise, and the manufacturer's preferences, among other factors. Several members supported this idea, but clarified the acceptance criteria. CPSC staff voiced concern for the reliability and validity of this approach.

3. Transmittance: The task group had planned to meet to discuss challenges with conducting transmittance tests and potential revisions to UL 8400. However, the task group did not have enough volunteers and decided to postpone the meeting. The TC Chair will send out an email to the TC to request participation.

4. Biomechanical Stress: The task group discussed the current requirements pertaining to neck strain and other harm to the upper cervical spine. Several members explained variability in head-mounted device (HMD) designs, such as the number and location of straps and weight (*e.g.,* some HMDs place weight at the rear of the head in addition to the front). The task group is trying to determine how best to measure the center of gravity of a 3D HMD and how to measure the longitudinal distance from the tragion notch to the center of gravity. One member described his experience testing to the standard and reviewed his test figures and methodology. He recommended allowing for multiple methods for performing the test. The task group discussed the current success criteria, and CPSC staff reiterated their concerns about the applicability of the data used to justify the current requirements (based on limited studies of head forms of U.S. Army Soldiers), and also encouraged the task group to address active head movements in addition to prolonged stationary use. Other members mentioned that it may be difficult and unethical to collect data on biomechanical stress from children wearing HMDs, but that a safety factor could be incorporated.

Next Steps:
The task groups will continue to work on their respective sections to improve the safety and clarity of UL 8400. The task groups plan to reconvene on Wednesday, September 20, 2023, from 11 a.m. to 1:00 p.m., ET. Other UL 8400 task groups (pertaining to skin compatibility, safety and warning instructions, and functional safety) plan to convene on Wednesday, September 13, 2023, from 11 a.m. to 12:30 p.m., ET.