

NEW  
<10MHz to >100GHz

SWISS  
EMC MADE

# EM Phantoms



## What are EM Phantoms?

SPEAG's growing family of electromagnetic (EM) phantoms are high-quality anthropomorphically shaped phantoms designed for over-the-air (OTA), SAR, and MRI performance evaluations as well as body-mounted and implant transceiver optimization. The fully posable whole-body phantom POPEYE10 enables testing of handheld and body-body transmitters

in any plausible usage scenario. Head, hand, and forearm phantoms compatible with current standard specifications provide accurate and reproducible OTA testing of wireless devices. Customized homogeneous or non-homogeneous phantoms, (e.g., ears, hands with custom grips, torsos with lungs, lossy blocks) are available upon request.

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# EM Phantoms **Optimized for OTA Evaluations**

## Posable Whole-Body Phantom POPEYE10

- POsable Phantom for Electromagnetic sYstems Evaluations V10
- Consists of torso (head, chest, abdomen shown in figure) with posable arms, legs, hands and feet
- For OTA and radiofrequency (RF)-link characterization of on-body and in-body wireless transmitters including wearables, hand-held, ear, and eye-worn devices
- Suitable for testing multiple body worn IoT and AR/VR devices
- Manufactured from a silicone-carbon based material with realistic losses for body-mounted devices
- Dimensions meet requirements for conservative testing
- Representative anatomy with details for testing all smart devices, including hearing aids, smart glasses, and contact lenses
- Simulates any realistic human posture and entire range of device usage
- Includes flat sections for device positioning at key locations such as shirt pockets, trousers pockets, and arm bands
- Stable positioning and easy transport with a dedicated low-loss and low-scattering stand

## Phantoms for 5G and 6G OTA Applications

- mmW- hand phantoms and mmW-POPEYE10 whole body phantom
- For optimization and testing of any 5G and 6G hand-held or body-worn transmitter
- Frequency range between 3 to >100 GHz
- Developed in light of a detailed study of human skin properties
- Unique coating simulates the average matching effects of the stratum corneum skin layer

## Customized Phantoms for Medical Applications

- Complex and simple anatomical phantoms specific to on-body or in-body medical applications
- Layered multi-tissue phantoms for RF-link characterization of implant devices
- Tissue-matching body-worn phantoms for clinical tests of implant devices
- Device-conformal solid phantoms for production testing of implant devices
- Anatomical whole or partial body phantoms for MRI applications

## SAM V4.5BS Head Phantom

- Light and robust CTIA compliant solid head
- Manufactured of high-precision injection-molded polypropylene
- Shell thickness  $2 \pm 0.2$  mm (6 mm at ear attachment point)
- Filling gel material from 300 MHz–7.125 GHz according to the IEEE/IEC, 3GPP, and CTIA standards
- Lightweight high-precision fixture for head and hand testing

## SHO- and mmW- Hand and Body Phantoms

- Silicone-carbon based material compliant with CTIA in the frequency range between 300 MHz–3 GHz or 3–7.125 GHz
- Anthropomorphically shaped right and left hand and body phantoms
- CTIA Hands for brick, clam, PDA, and ultra-wide type phones in talk and data mode
- CTIA generic forearm, chest and ankle phantoms for testing of wrist-, chest- and ankle-worn devices, respectively
- Tablet hands, Gaming hands (two-hand grip) and Laptop hands with most commonly used handgrips
- Chinese two-hand grip hands
- Low-loss and RF-transparent spacers for precise positioning
- Customized hands available upon request



POPEYE10 anthropomorphic phantom including UPPER LEGS, BUTTOCKS, ABDOMEN, CHEST, ARMS and HEAD phantoms with anatomical EYES and EARS



POPEYE10 head phantom in a head-set testing setup



mmW- hand phantoms with CTIA-compliant handgrips for 5G and 6G applications

For further information and technical specifications, visit [www.speag.swiss](http://www.speag.swiss)

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