

CPD surrogates

Brief status of the ISO work to UN IWG CLIV

2025-06-04

Future ISO xxxx, Road vehicles — Surrogates for assessment of in-vehicle child presence detection systems

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Project leaders of ISO work on CPD surrogates

Background

There is a rapid development of in-vehicle sensing systems and related communication to address the situations where children have been unattended left behind or trapped in cars.

The functionality of these systems can be evaluated using real children, or surrogates having child-like essential properties.

For objective and repetitive evaluations there are benefits of using surrogates – provided that they have trustworthy properties similar to those of real children.

What are these “trustworthy properties”? And how should they be validated to ensure that a surrogate is fit for its purposes?

These are tasks that we are currently trying to address in the ISO specifications under development. The goal is that CPD surrogates fulfilling the agreed ISO specifications will have the functionality and quality needed, regardless of the provider.

The ISO Working Group (ISO/TC22/SC33/WG16) has already developed several ISO standards on surrogate targets used to evaluate active safety systems in near collision events - the ISO 19206 series.

With the stakeholders and competence present in this ISO group, WG 16 has been given the task to develop specifications for CPD surrogates.

The work is currently in the preparatory stage and will be formalized when the group has agreed on the substantial contents.

Project status

- Project in preliminary stage, kick off meeting was held in February 2025
- Max time frame 36 months until publication, including balloting and processing
- Around 20 active experts from Austria, China, France, Germany, Japan, Luxembourg, Sweden, UK, and USA
- Shared project leadership: Jingjing Hao (CATARC, CN); Thomas Wimmer (4a, AT); Alex Kiendl (Messring, DE)
- Status June 2025: First working draft versions within the ISO Working Group



Examples of child surrogates in child seats above are only for illustration, not yet specified in the ISO document

Scope of the current ISO draft

This document specifies performance requirements for child presence detection (CPD) surrogates used to assess the detection and activation performance of in-vehicle child presence detection systems.

This document specifies the properties of CPD surrogates to represent children inside the vehicle, in terms of appearance properties (sizes, shapes, reflection), vital signs etc. for testing purposes.

This document addresses the detection requirements for CPD surrogates in terms of sensing technologies commonly in use at the time of publication of this document, and where possible, anticipated future sensing technologies.

This document does not address the test procedures in terms of positions or timing of events. Performance criteria for the in-vehicle CPD system are also not addressed.

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Working Draft (2025-06)

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Upcoming topics for the ISO CPD draft

- Decisions on required sizes
- Decisions on required optical properties
- Decisions on required radar properties
- Decisions on required posture/motion properties
- Validation and measurement procedures

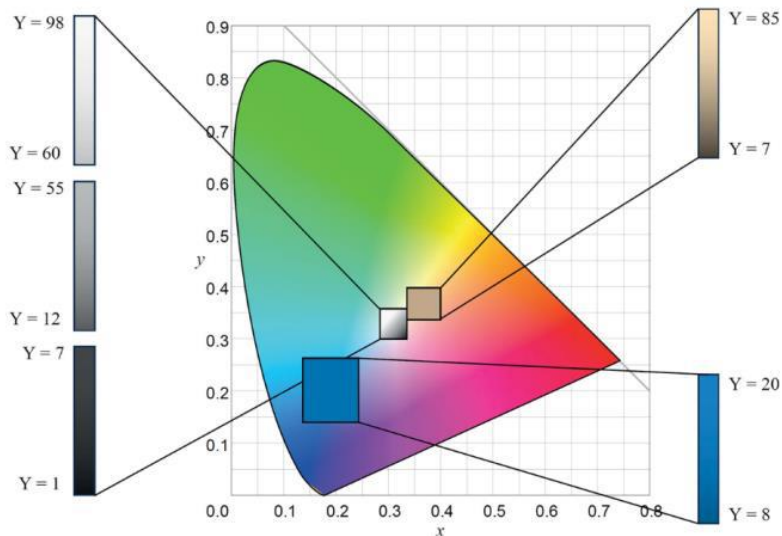


Table A.1 — Height of child from 0-6 years old

year	month	Weight (kg) (Male)	Weight (kg) (female)	Height (cm) (Male)	Height (cm) (Female)	Head (male)	Head (female)
newborn	0 month	2.26-4.66	2.26-4.65	45.2-55.8	44.7-65.0	30.9-37.9	30.4-37.5
	1 month	3.09-6.33	2.98-6.05	48.7-61.2	47.9-59.9	33.3-40.7	32.6-39.9
	2 month	3.94-7.97	3.72-7.46	52.2-65.7	51.1-64.1	35.2-42.9	34.5-41.8
	3 month	4.69-9.37	4.40-8.71	55.3-69.0	54.2-67.5	36.7-44.6	36.0-43.4
	4 month	5.25-10.39	4.93-9.66	57.9-71.7	56.7-70.0	38.0-45.9	37.2-44.6
	5 month	5.66-11.16	6.33-10.38	59.9-73.9	58.6-72.1	39.0-46.9	38.1-45.7
	6 month	5.97-11.72	5.64-10.93	61.4-75.8	60.1-74.0	39.8-47.7	38.9-46.5
	7 month	6.24-12.20	5.90-11.40	62.7-77.4	61.3-75.6	40.4-48.4	39.5-47.2
	8 month	6.46-12.60	6.13-11.80	63.9-78.9	62.5-77.3	41.0-48.9	40.1-47.7
	9 month	6.67-12.99	6.34-12.18	65.2-80.5	63.7-78.9	41.5-49.4	40.5-48.2
	10 month	6.86-13.34	6.53-12.52	66.4-82.1	64.9-80.6	41.9-49.8	40.9-48.6
	11 month	7.04-13.68	6.71-12.85	67.5-83.6	66.1-82.0	42.3-50.2	41.3-49.0
one year old	12 month	7.21-14.00	6.87-13.15	68.6-85.0	67.2-83.4	42.6-50.5	41.5-49.3
	15 month	7.68-14.88	7.34-14.02	71.2-88.9	70.2-87.4	43.2-51.1	42.2-50.0
	18 month	8.13-15.75	7.79-14.90	73.6-92.4	72.8-91.0	43.7-51.6	42.8-50.5
two years old	21 month	8.61-16.66	8.26-15.85	76.0-95.9	75.1-94.5	44.2-52.1	43.2-51.0
	24 month	9.06-17.54	8.70-16.77	78.3-99.5	77.3-98.0	44.6-52.5	43.6-51.4
	27 month	9.17-18.36	9.10-17.63	80.5-102.5	79.3-101.2	45.0-52.8	44.0-51.7
three years old	30 month	9.86-19.13	9.48-18.47	82.4-105.0	81.4-103.8	45.3-53.1	44.3-62.1
	33 month	10.24-19.89	9.86-19.29	84.4-107.2	83.4-106.1	45.5-53.3	44.6-52.3
	36 month	10.61-20.64	10.23-20.10	86.3-109.4	85.4-108.1	45.7-53.5	44.8-52.6
four years old	39 month	10.97-21.39	10.60-20.90	87.5-110.7	86.6-109.4		
	42 month	11.31-22.13	10.95-21.69	89.3-112.7	88.4-111.3	46.2-53.9	45.3-53.0
	45 month	11.66-22.91	11.29-22.49	90.9-114.6	90.1-113.3		
five years old	48 month	12.01-23.73	11.62-23.30	92.5-116.5	91.7-115.3	46.5-54.2	45.7-53.3
	51 month	12.37-24.63	11.96-24.14	94.0-118.5	93.2-117.4		
	54 month	12.74-25.61	12.30-25.04	95.6-120.6	94.8-119.5	46.9-54.6	46.0-53.7
five years old	57 month	13.12-26.68	12.62-25.96	97.1-122.6	96.4-121.6		
	60 month	13.50-27.85	12.93-26.87	98.7-124.7	97.8-123.4	47.2-54.9	46.3-53.9
	63 month	13.86-29.04	13.23-27.84	100.2-126.7	99.3-125.3		
	66 month	14.18-30.2	13.54-28.89	101.6-128.6	100.7-127.2	47.5-55.2	46.6-54.2
	69 month	14.48-31.43	13.84-29.95	103.0-130.4	102.0-129.1		

Figure above only for illustration, not yet decided

Figure above only for illustration, to be based on world-wide child data

Expected input for the ISO specification

- Results from CPD Consortium hosted by 4a
 - Suggestions on dummy properties
- Results of study from Ludwigs-Maximilians University Munich and MESSRING
 - Comparison of dummy sensing data and real children sensing data
- Input from measurements and evaluations by experts within the ISO WG

UN CLIV and ISO WG16

How can CLIV and ISO WG16 cooperate and support each other?

For example:

- Share common definitions, like CPD system
- Expected test procedures using the CPD surrogate, as input for the ISO CPD surrogate specifications
- Necessary sizes and other properties of CPD surrogates
- Reference studies within CLIV
- Future exchange and status reporting

Questions, comments?

Please contact your National Standards Body if you are interested in participating in the ISO activities as a nominated expert.

<https://iso.org/members>

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