FIFA EPTS TEST REPORT

EPTS Performance Test

Product Name	Bepro Cerberus (Post-Match)
Partner	Bepro Group Ltd
EPTS Product Type	Optical System
Quality Level	FIFA Quality
Test Date	01.06.2022
Certification Date	30.11.2022 to 29.11.2024
Submission Data Type	Post-Match Performance Data

INTRODUCTION

Introduction
The FIFA Quality Programme for EPTS Performance test offers a two-year FIFA Quality certification for tracking providers who are able to generate player and, in certain cases, ball tracking data. This process is carried out by quantifying the accuracies of wearable and optical tracking systems. This certification is offered to providers after quantifying the accuracy of their wearable (GPS & LPS) player tracking systems or optical tracking system. The test, conducted at an independent stadium, sees participants perform different scenarios in a specified test area. The collected data is measured via root mean square difference (RMSD) and evaluated for accuracy using a specified rating system.

Declaration of conformity	
This report details the results of EPTS Performance Tests carried out in accordance with the 'Handbook of Test Methods for EPTS Devices'. For further information about the exact test procedure, please refer to the 2022 edition of the Handbook of Test Methods for EPTS devices.	
Technician	Dr Jade Haycraft
Date	11.08.2022
Signature	
Report checked by	Professor Rob Aughey
Date	11.08.2022
Signature	

PLAYER TRACKING TEST DETAILS

Test details	
Test Date	01.06.2022
Test Location	Estadio Nuevo Mirandilla, Cádiz, Spain
Test Institute	Track at Victoria University
Test Number	127429
Test Manual	EPTS Performance Standard | 2022
EPTS Product Type	Optical System
Assessment Metrics	Post-Match Performance Data
Number of Cameras	2
Camera Model Names	Bepro Custom Camera System
Submission Time	< 23 hours

Fulfilment of test requirements

Test block	Capture & submission
Circuit	Yes
2 v 2 Game	Yes
5 v 5 Game	Yes
Sprints	Yes
Full Pitch Coverage	Yes

Analysis interpretation

Measure	Definition
Root Mean Square Difference (RMSD)	A commonly used measure of accuracy based on the standard deviation (σ) of the differences between the manufacturer and Vicon system. A large sample of RMSD values from GNSS, LPS & Optical provider comparisons were used to set the ranking criteria.
Data Points Compared with Vicon	Varies depending on the quality of Vicon capture, as only the highest quality data is used for comparative purposes.
Live Data Submissions	Live data is considered as data that can be used in real time; this varies depending on the application.

Rating System (including legend)

Q1 - 1.5 x IQR   Q1   Median   Q3   Q3 + 1.5 x IQR

IQR

-4σ   -3σ   -2σ   -1σ   0 σ   +1 σ   +2σ   +3σ   +4σ

Well-above industry standard
Above industry standard
At industry standard
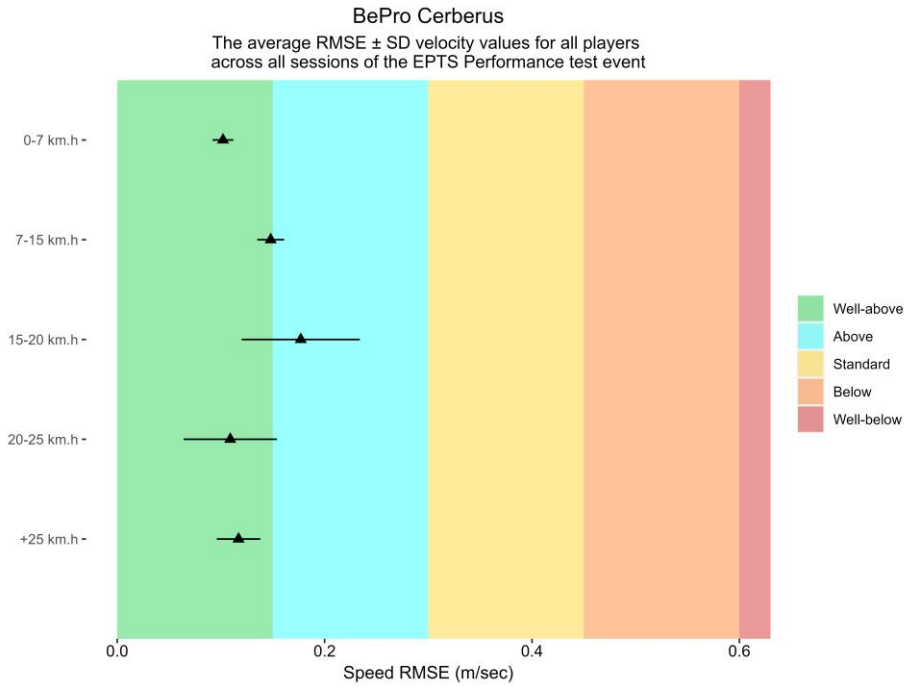Below industry standard
Well-below industry standard
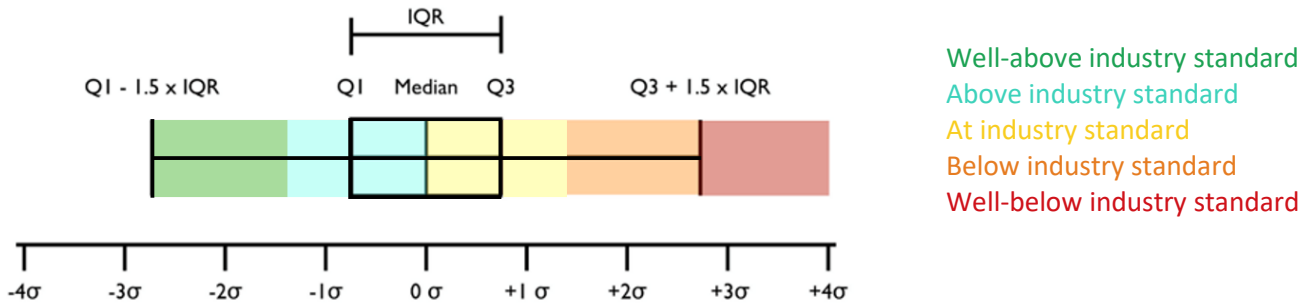
Analysis conducted on >1,000,000 data points from over 30 systems at the past four EPTS test events form the basis of the ranking system, these are reviewed on a yearly basis.

Rating by FIFA Velocity Band

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	0-7 km/h	7-15 km/h	15-20 km/h	20-25 km/h	25+ km/h
Velocity RMSD (m/s)					
Position RMSD (m)					

Well-above	Above	Standard	Below	Well-below

Velocity Plot

BePro Cerberus

The average RMSE ± SD velocity values for all players
across all sessions of the EPTS Performance test event

Position Plot

BePro Cerberus

The average MAE ± SD velocity values for all players
across all sessions of the EPTS Performance test event