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Attached file:

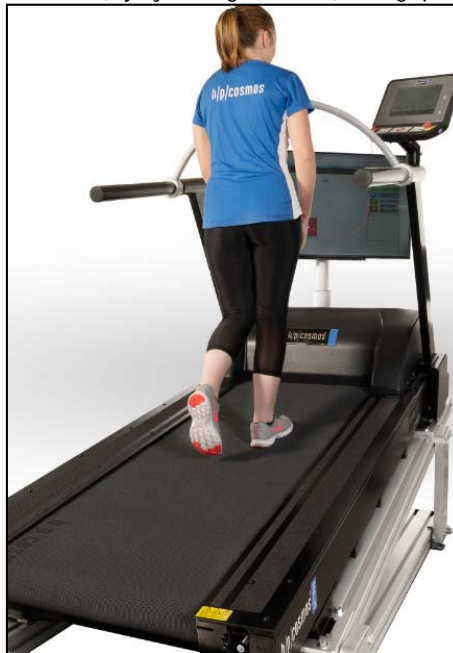
Validation of single belt algorithm in double stance phase:

20180710\_hpcosmos\_gaitway\_3d\_wcb\_contribution\_meurisse\_vertical\_grf\_determination\_0.pdf

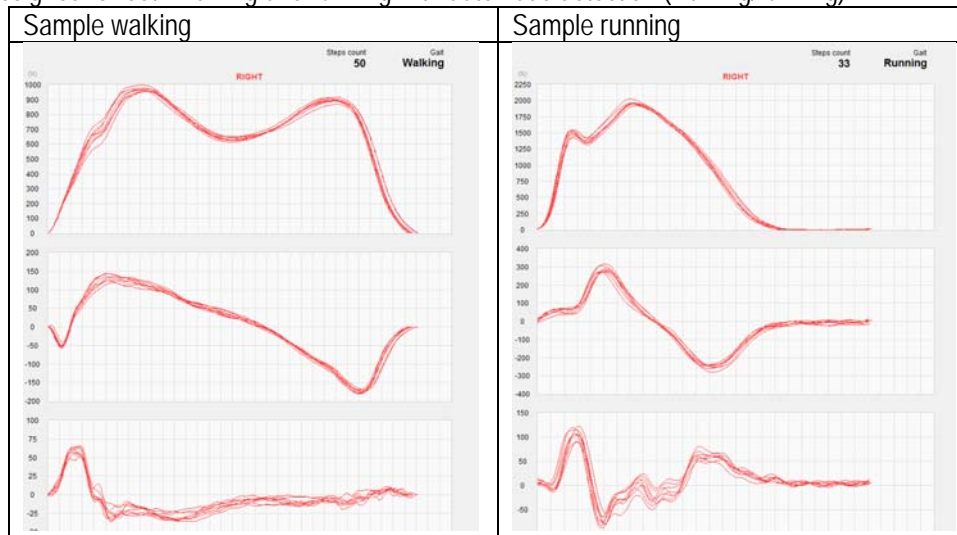
20190730\_Bastien\_Gait&Posture\_2019\_Decomposition\_of\_shear\_forces\_in\_double\_contact\_of\_walking\_proof.pdf

**gaitway 3D unique selling proposition USPs:**

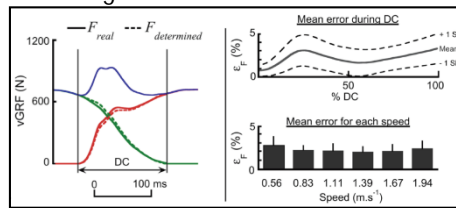
- a) single belt technology (without any gap) allows overcrossing, barefoot walking/running without "psychological" or physical interference (injury during barefoot) of a gap



- b) Designed for both walking and running with automatic detection (walking/running)

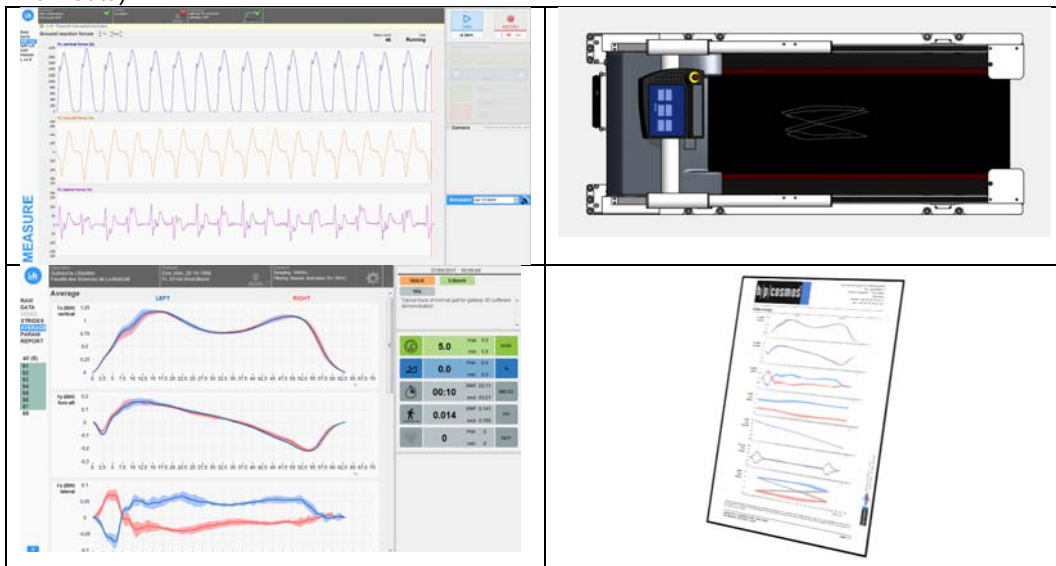


- c) high quality force decomposition validated from Biomechanics Lab University of Louvain (G.M. Meurisse and G.J. Bastien, Belgium) for single belt ground reaction forces during double stance phase in walking. Decomposition based on an accurate algorithm and robust machine learning.



In running (without double stance phase), the decomposition does not apply and is not relevant, thanks to the big single belt running deck and the nature of running.

- d) Complete integrated user software (control, acquisition, biofeedback, analysis, report, self-speed control, raw data)

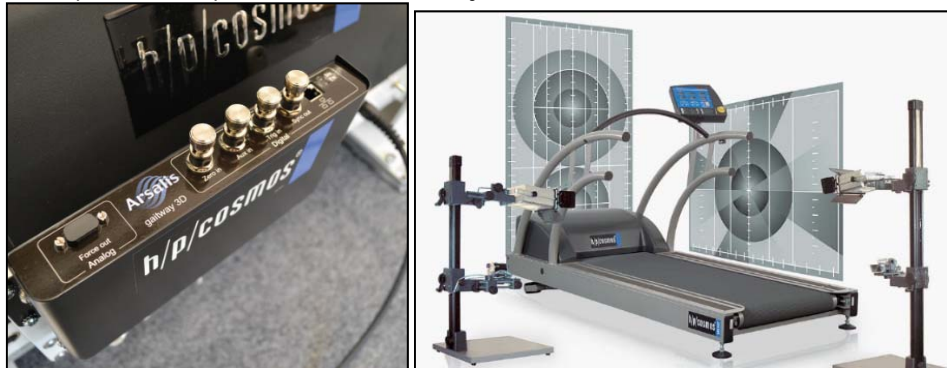


- e) the only treadmill on the market combining 3 component force measurement AND pressure distribution in one system  
thus allowing also evaluation of further relevant parameters, e.g. foot internal/external rotation, roll-off analysis, pressure matrix, standing foot type / shape analysis (flat / high arch ...)

Also: optional high-speed video, IMU and EMG can be synchronized for complete subject evaluation

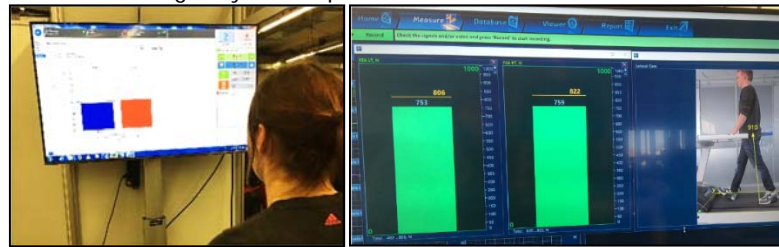


- f) Interfaces for signal integration into external systems in a biomechanical lab (e.g. 2D or 3D motion capturing, EMG, MatLab):  
 Digital (Ethernet) with optional data streaming software module  
 Analog signal interface for the easiest way of data transmission  
 Connectivity plans available for most common systems /brands (e.g. NORAXON, Qualisys, Vicon, SIMI, KISTLER compatible force plate software, and many more.)



Synchronization to less than 1 millisecond

- g) Real time Bio feedback on L/R gait cycle and parameters



- h) Gait analysis PDF report for walking and running

Gait parameter	Both sides	SI*	Left side	Right side
	Mean ±sD		Mean ±sD	Mean ±sD
Impact Peak Force (N)	1800 ±62.3	-2%	1830 ±77.4	1770 ±77.2
Active Peak Force (N)	2030 ±49.3	-1%	2050 ±43.7	2020 ±51.8
Impulse (N s)	274 ±6.11	-3%	282 ±3.16	267 ±2.48
Loading Rate (N/s)	10400 ±67.20	+0%	10400 ±5800	10400 ±7760
Push Off Rate (N/s)	23200 ±1050	-4%	24000 ±770	22400 ±300
Time to Impact Peak (ms)	28.4 ±2.06	-2%	28.9 ±1.86	27.9 ±2.20
Time to Active Peak (ms)	96.1 ±4.03	-1%	96.1 ±4.07	97.1 ±3.87
Step Duration (ms)	330 ±5.50	-1%	333 ±4.26	327 ±5.08
Contact Duration (ms)	219 ±5.37	+0%	220 ±5.81	216 ±4.92
Aerial Duration (ms)	111 ±7.17	-2%	113 ±5.70	109 ±7.20
Step Length (cm)	147 ±8.01	-1%	148 ±7.22	146 ±8.73
Stride Duration (ms)	660 ±5.89			
Cadence (spm)	162 ±1.66			
Base of Support Width (cm)	6.97 ±1.55			

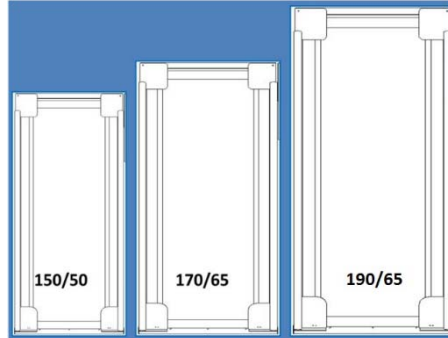
- i) Raw data export (ASCII tabulated text format) for external data processing

Time (s)	F11 (N)	F12 (N)	F21 (N)	F22 (N)	F31 (N)	F32 (N)	F41 (N)	F42 (N)	F51 (N)	F52 (N)	F61 (N)	F62 (N)	F71 (N)	F72 (N)	F81 (N)	F82 (N)	F91 (N)	F92 (N)	F101 (N)	F102 (N)	Speed (m/s)	Vertical GRF	GRF form	GRF lateral	GRF AP
0.0000	4711	4741	4683	4648	30002	38267	36660	36551	1303	1.068.075	-87.884	69.588	0.804												
0.0010	4712	4751	4676	4838	30020	38272	36664	36557	1338	1.068.172	-84.263	69.013	0.803												
0.0020	4716	4762	4668	4829	30044	38279	36666	36561	1303	1.068.401	-80.793	68.568	0.802												
0.0030	4718	4771	4662	4822	30068	38284	36667	36565	1303	1.068.425	-76.383	68.913	0.801												
0.0040	4721	4784	4655	4815	30089	38290	36662	36570	1309	1.068.484	-71.664	65.222	0.800												
0.0050	4724	4796	4653	4807	30104	38296	36653	36572	1328	1.068.401	-68.402	63.051	0.799												
0.0060	4729	4805	4651	4797	30117	38308	36642	36569	1303	1.068.584	-60.547	60.384	0.798												
0.0070	4737	4825	4600	4767	30130	38329	36626	36561	1338	1.067.817	-55.130	57.213	0.797												
0.0080	4746	4838	4647	4777	30149	38354	36605	36549	1328	1.066.505	-49.135	53.829	0.796												
0.0090	4754	4851	4644	4767	30175	38379	36582	36532	1329	1.064.767	-43.142	49.671	0.795												
0.0100	4758	4860	4641	4754	30195	38400	36560	36513	1470	1.062.845	-37.208	45.422	0.794												
0.0110	4758	4865	4635	4740	30214	38417	36536	36496	1331	1.059.403	-31.246	42.004	0.793												
0.0120	4754	4867	4628	4727	30235	38430	36514	36480	1322	1.056.537	-25.961	38.529	0.792												
0.0130	4748	4870	4623	4713	30257	38443	36489	36466	1338	1.052.627	-20.764	35.113	0.791												
0.0140	4741	4874	4615	4701	30280	38457	36463	36453	1328	1.048.154	-15.944	27.861	0.790												
0.0150	4737	4880	4611	4690	30294	38465	36443	36447	1329	1.044.138	-11.217	23.857	0.789												
0.0160	4734	4890	4607	4678	30297	38465	36422	36445	1303	1.037.809	-6.741	20.165	0.788												
0.0170	4733	4899	4602	4666	30294	38463	36402	36447	1209	1.032.548	-2.325	16.621	0.787												
0.0180	4731	4905	4599	4655	30291	38457	36386	36449	1103	1.026.038	2.155	13.829	0.786												
0.0190	4730	4909	4583	4643	30296	38457	36373	36453	1490	1.023.763	6.839	11.209	0.784												
0.0200	4728	4913	4577	4629	30309	38450	36363	36456	1490	1.021.313	11.764	8.964	0.783												

j) Designed for biomechanics, material testing (shoe, prosthesis, insole), training and for rehabilitation



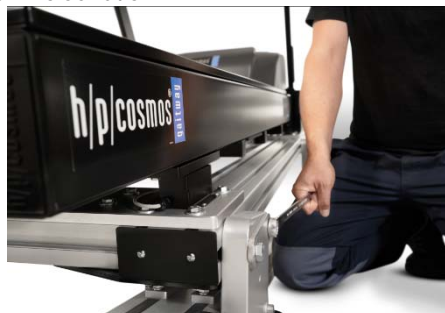
k) available in different running deck sizes, like 150/50 or 170/65 or 190/65 cm



l) available with inclination uphill/downhill (through reverse belt rotation) and in high speed option up to 45 km/h



m) solid mechanical fixation at elevation for high accurate data measurement during uphill/downhill high natural frequencies and low noise ratio

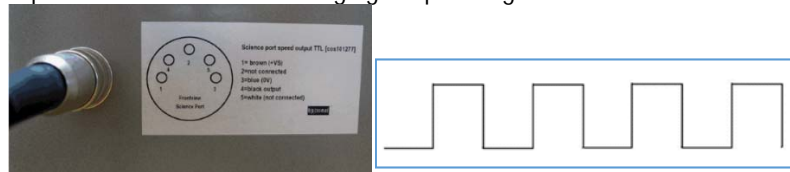


- n) UserTerminal with software and MCU6 GUI 10" TouchScreen and Windows 10 OS



- o) coscom v4 worldwide widely accepted and ISO 14971 as well as EN 62304 compliant interface protocol for data exchange and treadmill/ergometer control. documentation published at [www.coscom.org](http://www.coscom.org)

- p) science port for speed raw data without averaging of speed signals



- q) Ready for safety arch or ceiling mount harness (fall prevention system) for non-interference to 3D Motion Capture Systems



- r) many options and accessories available, such as removable handrails, black matt and non-reflecting powder coating, visual stimulation via projector for visual cueing for neurological patients, VR software, wheelchair ramps, airwalk ap unweighting system, arm support, etc.,



- s) designed and built according to IEC 60601-1 standard including potential isolation transformer and potential equalization pin / bus bar
- t) EMC certificate for electromagnetic compatibility
- u) CE mark as scientific device and in preparing for medical device certification



- v) Probably the most modern, sophisticated and cost effective solution worldwide
- w) Building research treadmills since 1989

gaitway 3d white paper with summary of features, comparison of various measurement technologies and studies:  
 EN: 20171206\_cos102999\_150-50\_hpcosmos\_gaitway\_3d\_instrumented\_single\_belt\_force\_plate\_treadmill.pdf  
[https://www.hpcosmos.com/sites/default/files/uploads/documents/20171206\\_cos102999\\_150-50\\_hpcosmos\\_gaitway\\_3d\\_instrumented\\_single\\_belt\\_force\\_plate\\_treadmill.pdf](https://www.hpcosmos.com/sites/default/files/uploads/documents/20171206_cos102999_150-50_hpcosmos_gaitway_3d_instrumented_single_belt_force_plate_treadmill.pdf)

CN: 20180420\_cos102999\_150-50\_hpcosmos\_gaitway\_3d\_instrumented\_single\_belt\_force\_plate\_treadmill\_whitepaper\_cn.pdf  
[https://www.hpcosmos.com/sites/default/files/uploads/Brochure/20180420\\_cos102999\\_150-50\\_hpcosmos\\_gaitway\\_3d\\_instrumented\\_single\\_belt\\_force\\_plate\\_treadmill\\_whitepaper\\_cn.pdf](https://www.hpcosmos.com/sites/default/files/uploads/Brochure/20180420_cos102999_150-50_hpcosmos_gaitway_3d_instrumented_single_belt_force_plate_treadmill_whitepaper_cn.pdf)

Some more information about gaitway please find on our website:

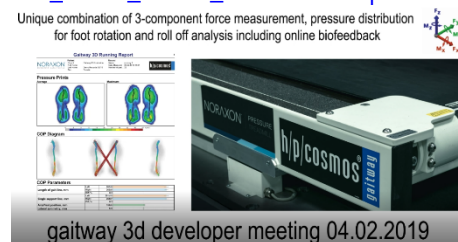
<https://www.hpcosmos.com/en/products/software-measuring-technology/biomechanics-gaitway-3d>

high and low resolution videos:

[https://www.hpcosmos.com/sites/default/files/uploads/videos/20190228\\_hpcosmos\\_cos102999\\_gaitway\\_3d\\_noraxon\\_zebris\\_arsalis\\_1280x720.mp4](https://www.hpcosmos.com/sites/default/files/uploads/videos/20190228_hpcosmos_cos102999_gaitway_3d_noraxon_zebris_arsalis_1280x720.mp4)

HD:

[https://www.hpcosmos.com/sites/default/files/uploads/videos/20190228\\_hpcosmos\\_cos102999\\_gaitway\\_3d\\_noraxon\\_zebris\\_arsalis\\_1920x1080.mp4](https://www.hpcosmos.com/sites/default/files/uploads/videos/20190228_hpcosmos_cos102999_gaitway_3d_noraxon_zebris_arsalis_1920x1080.mp4)

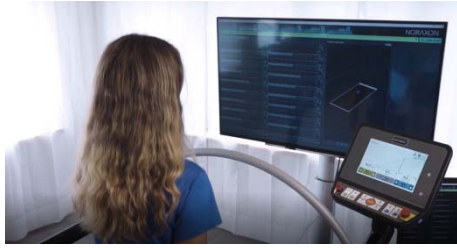


another very nice video:

[https://www.hpcosmos.com/sites/default/files/uploads/videos/20190729\\_hpcosmos\\_cos102999\\_170-65\\_gaitway3d\\_720.mp4](https://www.hpcosmos.com/sites/default/files/uploads/videos/20190729_hpcosmos_cos102999_170-65_gaitway3d_720.mp4)

HD

[https://www.hpcosmos.com/sites/default/files/uploads/videos/20190729\\_hpcosmos\\_cos102999\\_170-65\\_gaitway3d.mp4](https://www.hpcosmos.com/sites/default/files/uploads/videos/20190729_hpcosmos_cos102999_170-65_gaitway3d.mp4)



Go for the best!

With cosmic regards

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