Welcome and Introduction

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SportSURF 2nd Workshop
26th April, 2006

SPORTSURF
Sport Surfaces Research Forum

Supported by:
EPSRC

Network Introduction

EPSRC Funded, awarded May 2005, for 3 years

Emerged from an EPSRC initiative ‘Thinking About Sport’ in December 2003

Self sufficient after 3 years….

Core members developed the proposal, supported by many organisations/parties

Network Objectives

The specific objectives are:

- to create a new interdisciplinary ‘surfaces’ community
- **to host stimulating meetings/workshops open to all plus a new specific conference (2007)**
- **to transfer ideas, techniques, models and technology between researchers and practitioners**
- to produce multidisciplinary research proposals
- **to disseminate the network outcomes widely via the web, publications, press releases…..**

Membership

General Membership

Open to any individual or organisation that has an interest in sports surfaces

International membership is being developed…..

Sports governing bodies considered vital… and a balance between academia and industry….

Membership Update

Approximately 40/60 Split (Academic/Non-Academic), total membership is now just under 100.

Current organisations members include:

FA, FF, RFU, E HOCKEY, FIH, IOG, SPORT ENGLAND, NPFA, BOA, EIS, SAPCA, STRI & many others

Worldwide membership including USA, Canada, Australia, New Zealand and several European countries (Spain, Belgium, France, Italy, Switzerland)

The Day

Focus: Quantify the ‘Performance Requirements’ of Sports Surfaces

What are these requirements?

How has current guidance been derived?

Current research and future needs?

Welcome pack – SportSURF information flyer, delegate list, speaker details, agenda and a feedback/question form…please take the time to fill out the feedback form, thanks.

Programme

Session 1 – 10:00 to 12:45

10:00	Key note presentation I *(Dr Stuart Miller & Jamie Capel-Davis - ITF)*
	•International Tennis Federation's Surface Classification Scheme
	•The science behind the scheme
10:45	Q & A forum – Dr Stuart Miller & Jamie Capel-Davis
11:15	Coffee break
11:45	Discussion Forum/Open presentations

Lunch 12:45 to 14:00

Session 2 – 14:00 to 15:45

14:00	Keynote presentation II *(Dr Eric Harrison - FIFA, IRB)*
	•Development of the FIFA quality concept and IRB regulation 22
	•Research behind the standards
14:45	Q & A forum – Dr Eric Harrison
15:15	Coffee break

Session 3 – 15:45 to 16:30

15:45	Discussion Forum/Open presentations
16:15	Summary/closing remarks
16:30	ENDS

Key Note 1

Dr S Miller and
J Capel-Davis

Discussion Forum/ Open presentations

Lunch
&
Posters

Key Note 2

Dr E Harrison

Discussion Forum/ Open presentations

Launch Feedback

Key Points (Presentations)

- **Build quality can and does affect surface performance**
- **Users perception can be matched to some play performance tests (impact and rotational torque was good, slip and ball roll poor)**
- **Ball/surface impact modelling – possible & useful**
- **Player-surface – multifactorial, combined tests.**
- **Medical/Injury – Little or no significant difference between artificial grass and natural grass. However, cause of injuries not always clear – more research required.**
- **Age/wear related data is missing…**

Launch Feedback

<u>Key Points (break out sessions)</u>

- SUSTAINABILITY WATER + INFILL (Health)
- ENGINEERING FOR INCREASED PARTICIPATION
- SHOE SURFACE INTERACTION - SHOE DESIGN
- SURFACE PROPERTIES + INJURY
- DO WE CHANGE SURFACE OR THE GAME?
- LONG-TERM INJURY DATA REQUIRED

Research Needs?

Play performance (pitches) – is natural turf the appropriate benchmark?

Player safety – is there merit in designing to reduce risk? Can we quantify risks (injury)? (Level of play/ability a consideration?)

Surface Design – are the materials and interactions understood? Can the designs be 'optimised'?

Longevity – is there a need for more cost effective solutions, that may compromise any of the above?

Discussion – topics

Tennis (and other ‘hard’ surfaces)

1. **Is surface hardness/stiffness important?**
2. **Is frictional behaviour understood? Variables that affect friction are….?**
3. **Is there adequate guidance for player safety, e.g. shoes, impact and friction related limits?**
4. **Is ball-surface interaction more important than player-surface interaction?**
5. **Longer term behaviour – when does a court need resurfacing/painting, how do we/should we monitor them?**

Discussion – topics

Football (Rugby, hockey ?)

1. **Is surface hardness/stiffness important – should a pitch be consistent across/between pitches?**
2. **Is frictional behaviour understood? Variables that affect friction are….?**
3. **Is there adequate guidance for player safety, e.g. shoes/studs, impact and friction related limits?**
4. **Is ball-surface interaction more important than player-surface interaction, or vice versa?**
5. **Long term behaviour – when does a pitch need (intensive) maintenance or resurfacing, how do we monitor them effectively?**

Discussion – topics

Surface behaviour – Modelling (1)

1. **Are the material (mechanical) properties well understood? Does build quality affect them?**
2. **Are the design requirements, e.g. loading conditions, external influences (e.g. temperature/water) well understood?**
3. **Is it always a compromise between design for ball-surface interaction and player-surface interaction, and for multi-sports surfaces?**
4. **Long term behaviour – can the ageing process be adequately simulated/modelled?**

Discussion – topics

Surface behaviour – Modelling (2)

5. Should we have a database of surface types and ‘behaviour’, including test results?
6. Is the effect of maintenance well understood and is there a balance between ‘too little’ and ‘too much’…? Does data exist to ‘fit’ to a model?
7. Do the ‘standards’ (and the play performance tests) provide impetus for innovation, or stifle innovation?

Long-term research

Surfaces - future developments….?

1. **Should there be ‘coherent’ research to develop surfaces whereby the element properties are controlled such that the behaviour is very consistent and predictable, and as ‘safe’ as is possible?**

2. **Can surfaces incorporate ‘smart’ materials, that vary behaviour under e.g. different loading rate/magnitude and be more robust, or should they be cheaper, easier to lay and easily replaceable? (Community perhaps?).**

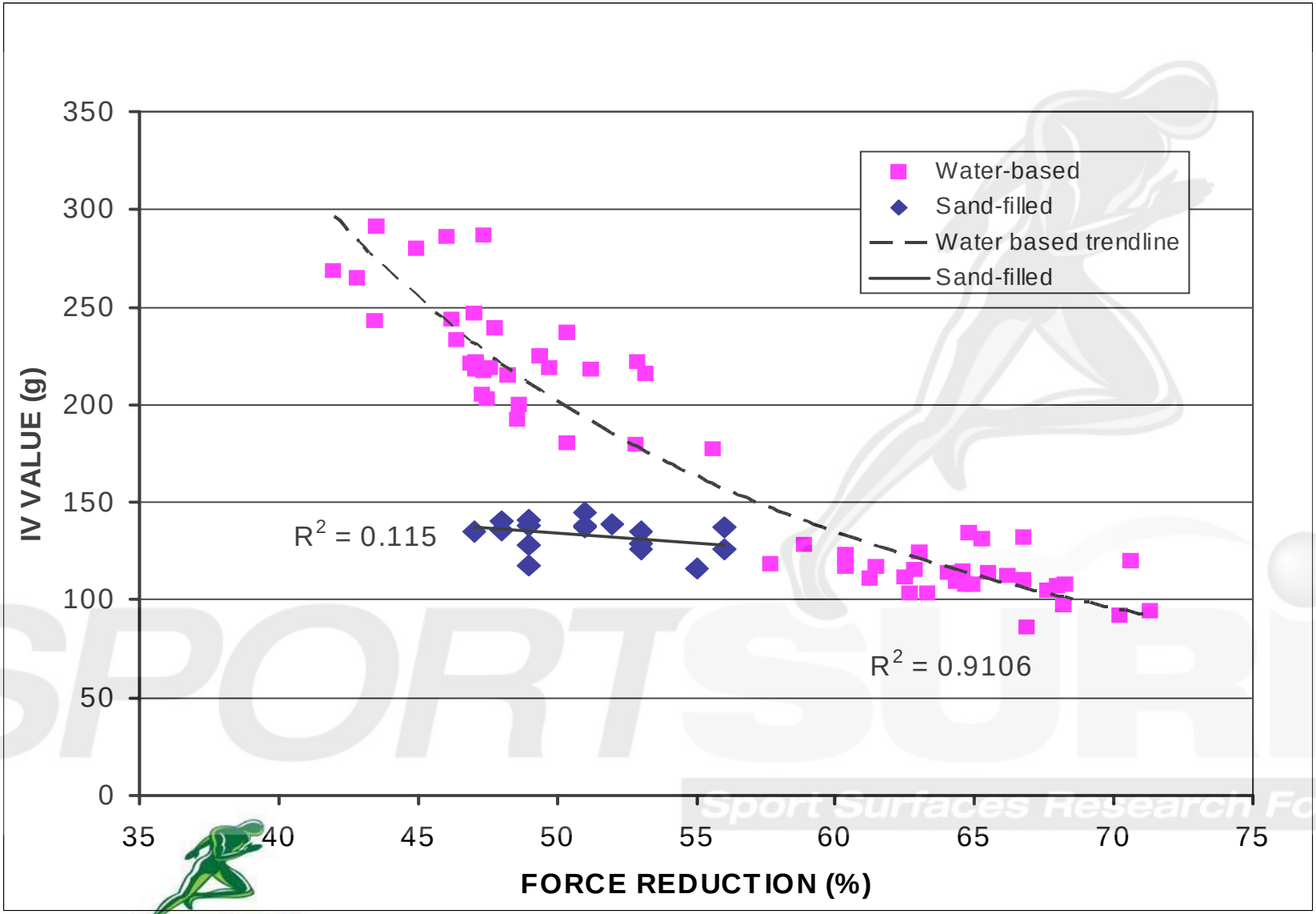
Research - Current

Rate of Loading Effects

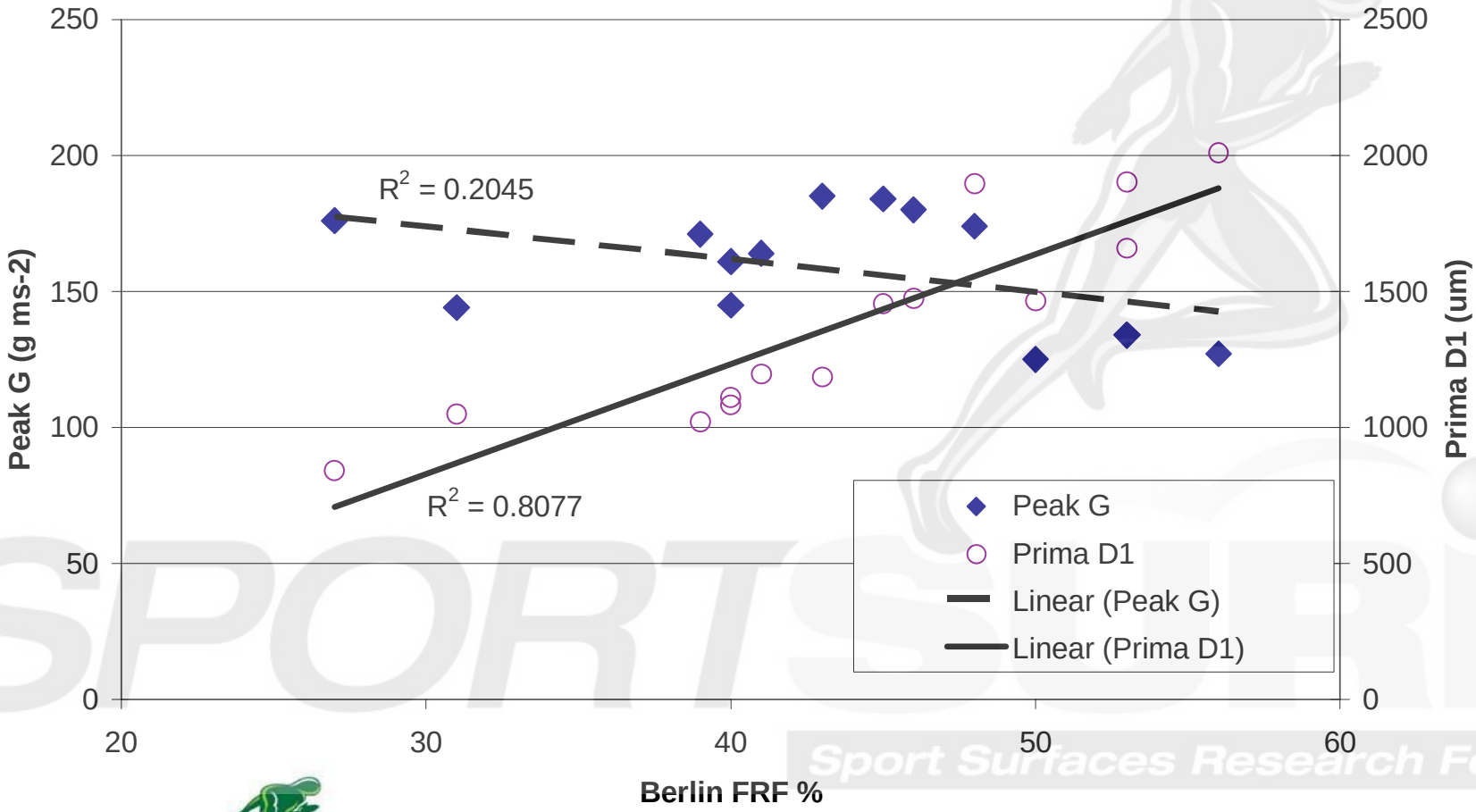
System visco-elastic behaviour
Components of system – interaction
Energy dissipation

Pitches
Sports Hall Floors

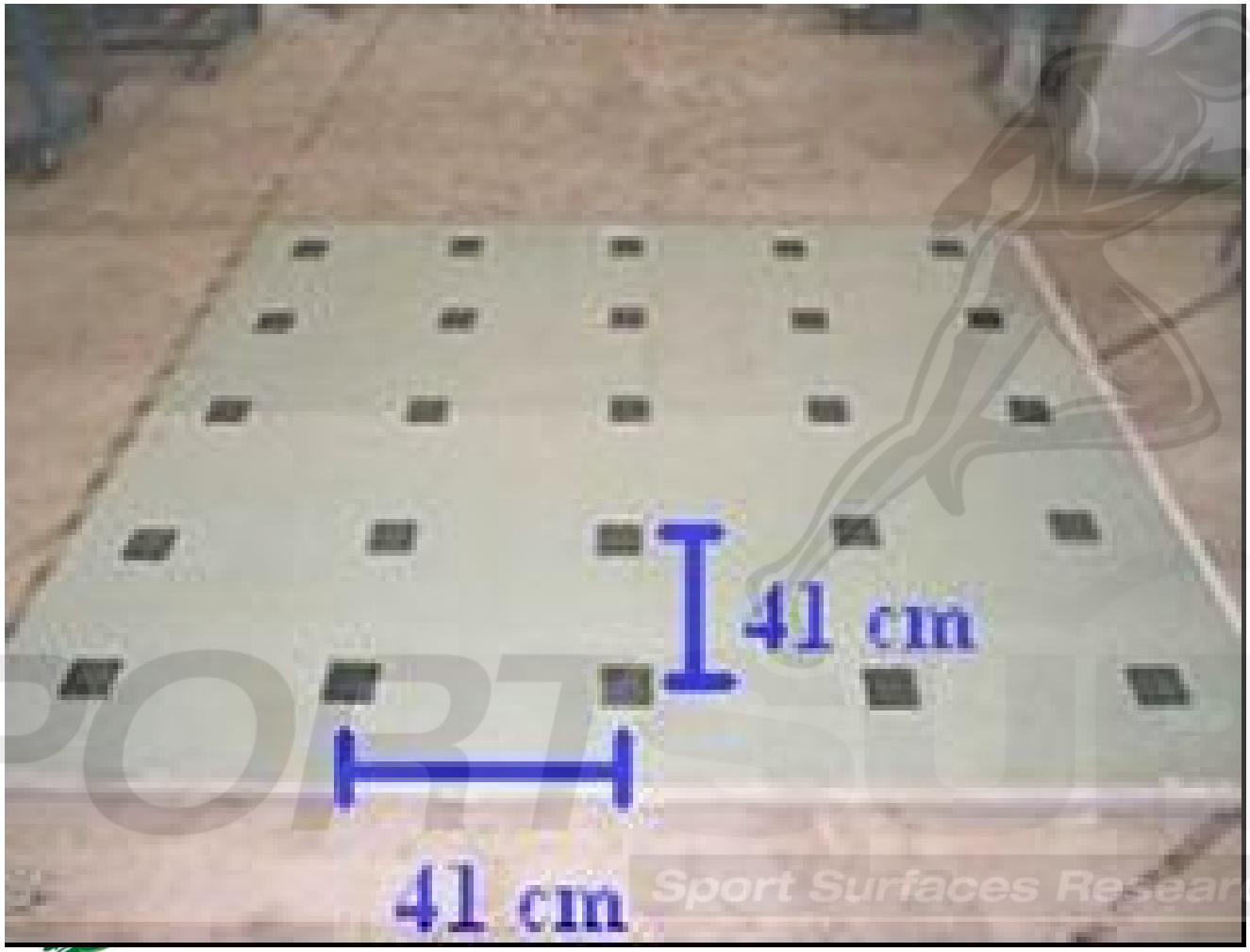
Rate of Loading - (Impact vs Damped)



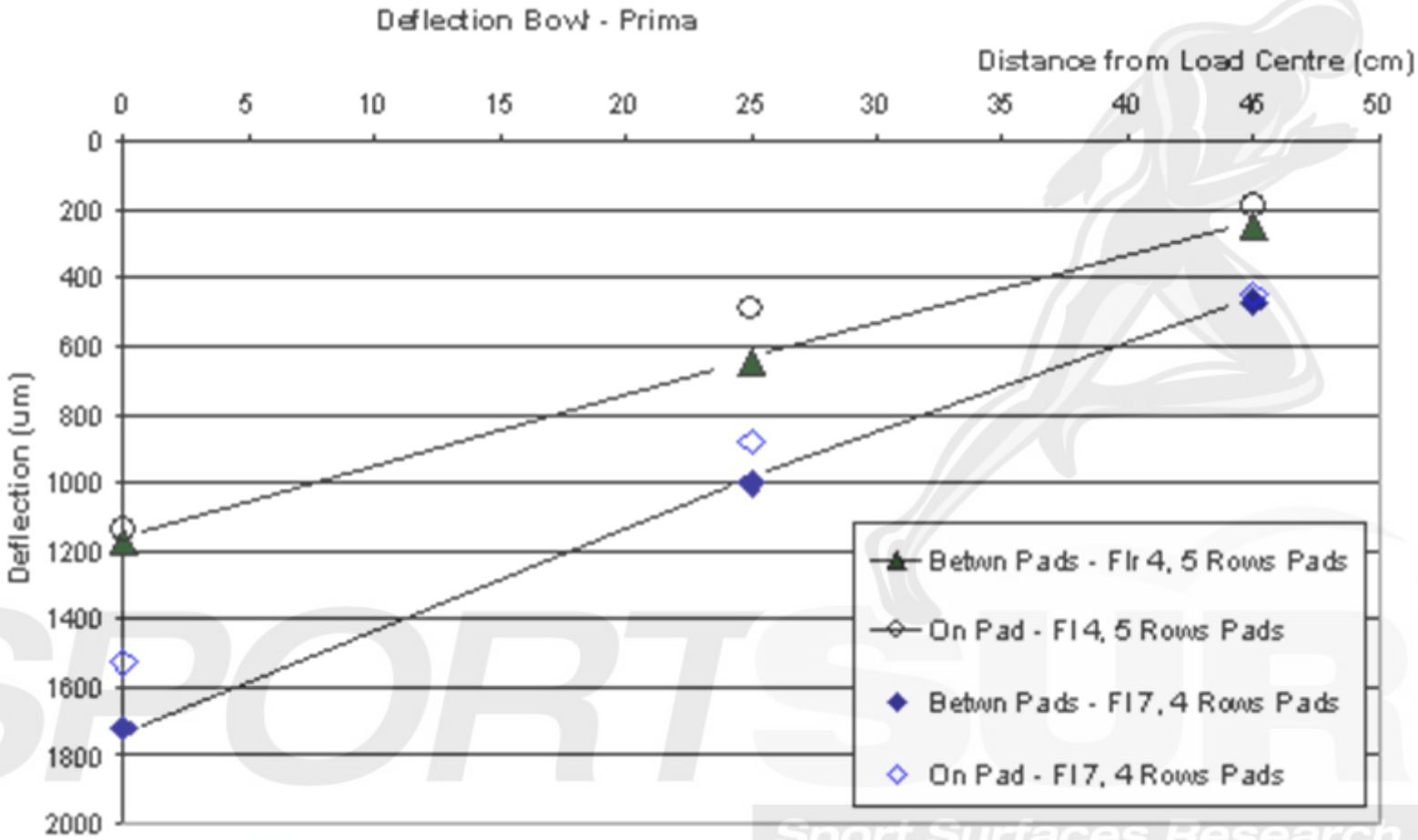
Rate of Loading - (Impact vs Damped)



Floor – Pad & Board Effects



Floor – Bending Behaviour



Current Research

Pitch Components

Foundation

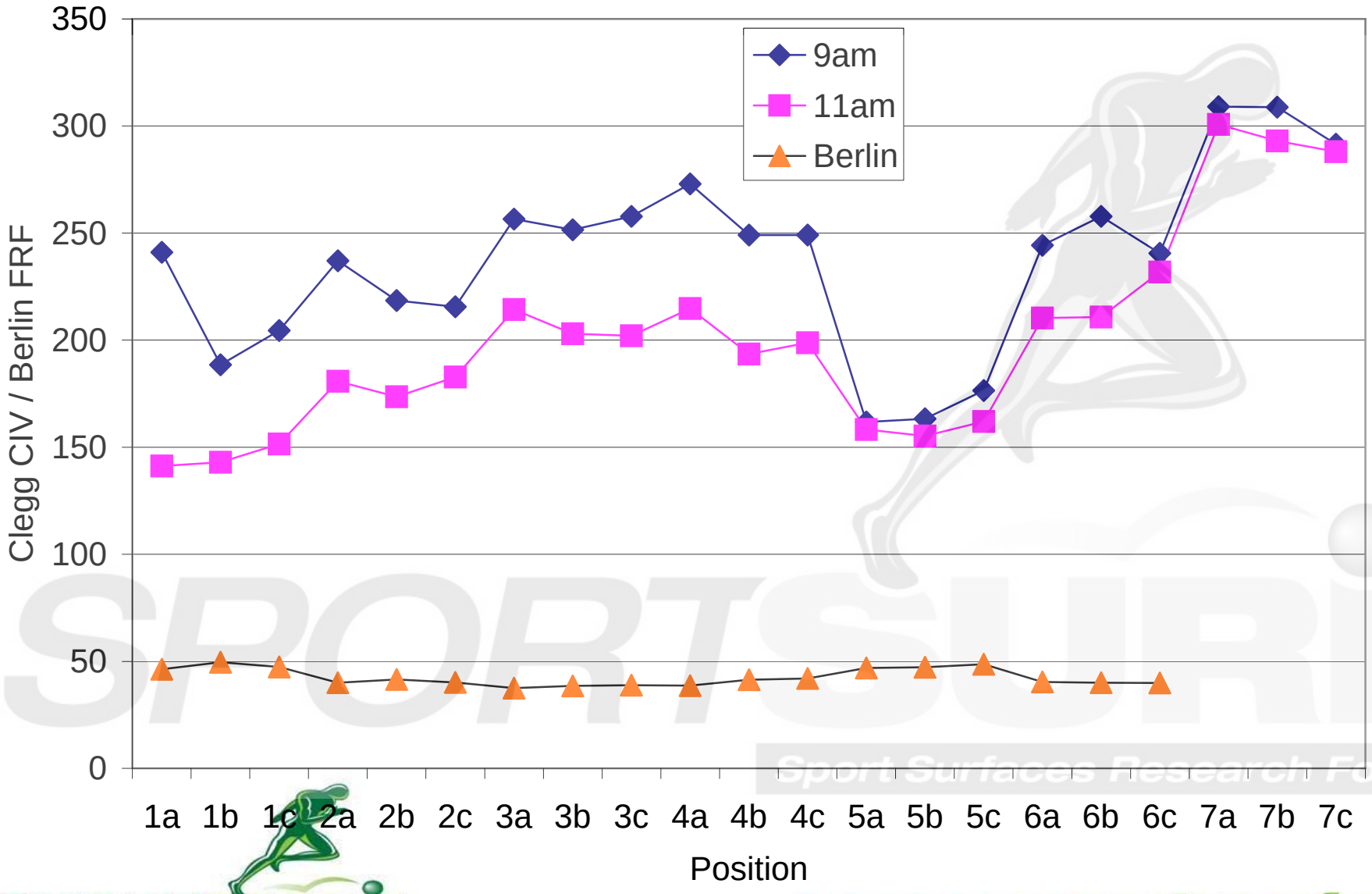
Shockpads

Carpet

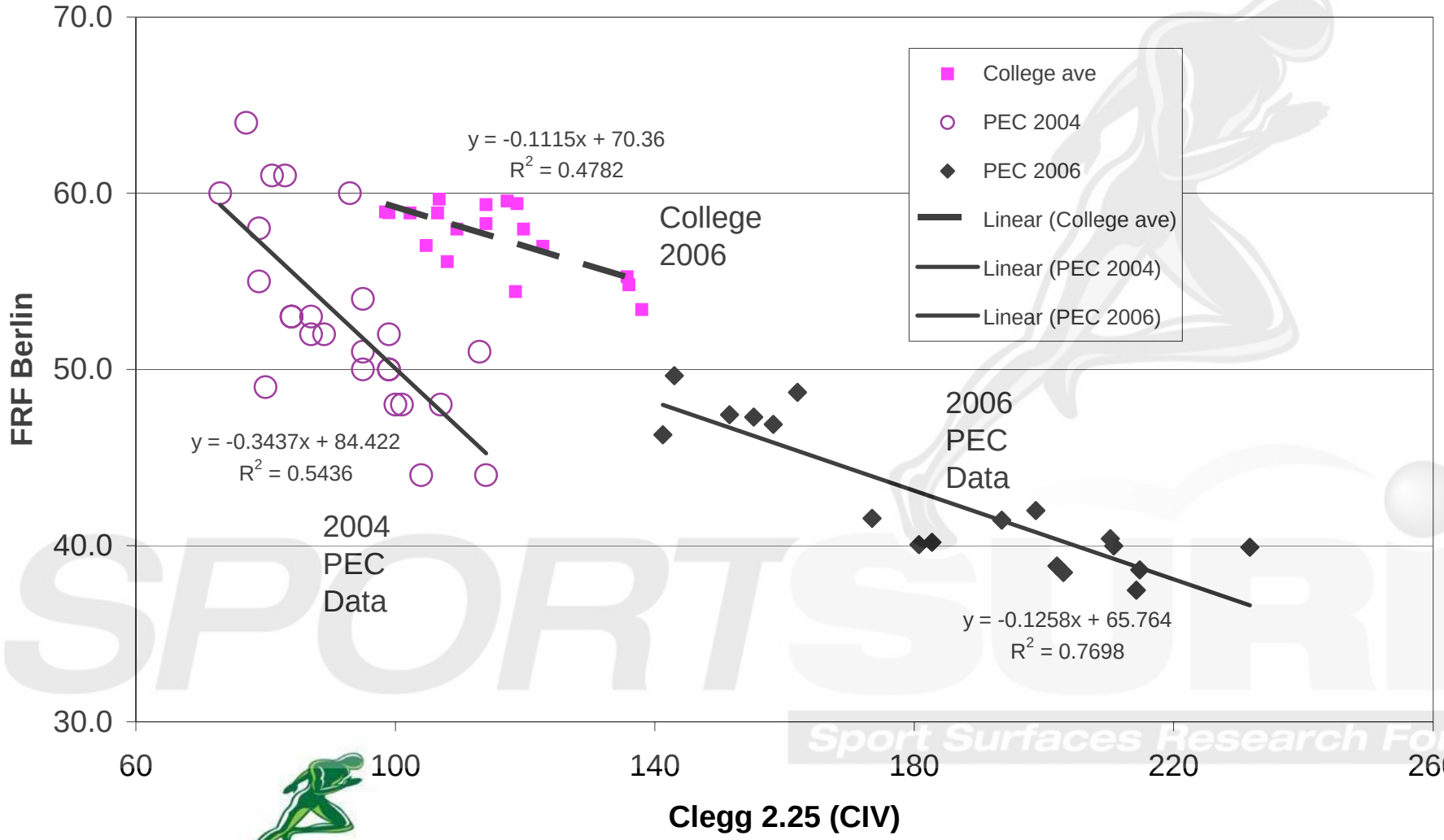
Fill

Rubber infill

3G LU - Temp



3G Pitches at LU



LU DATA

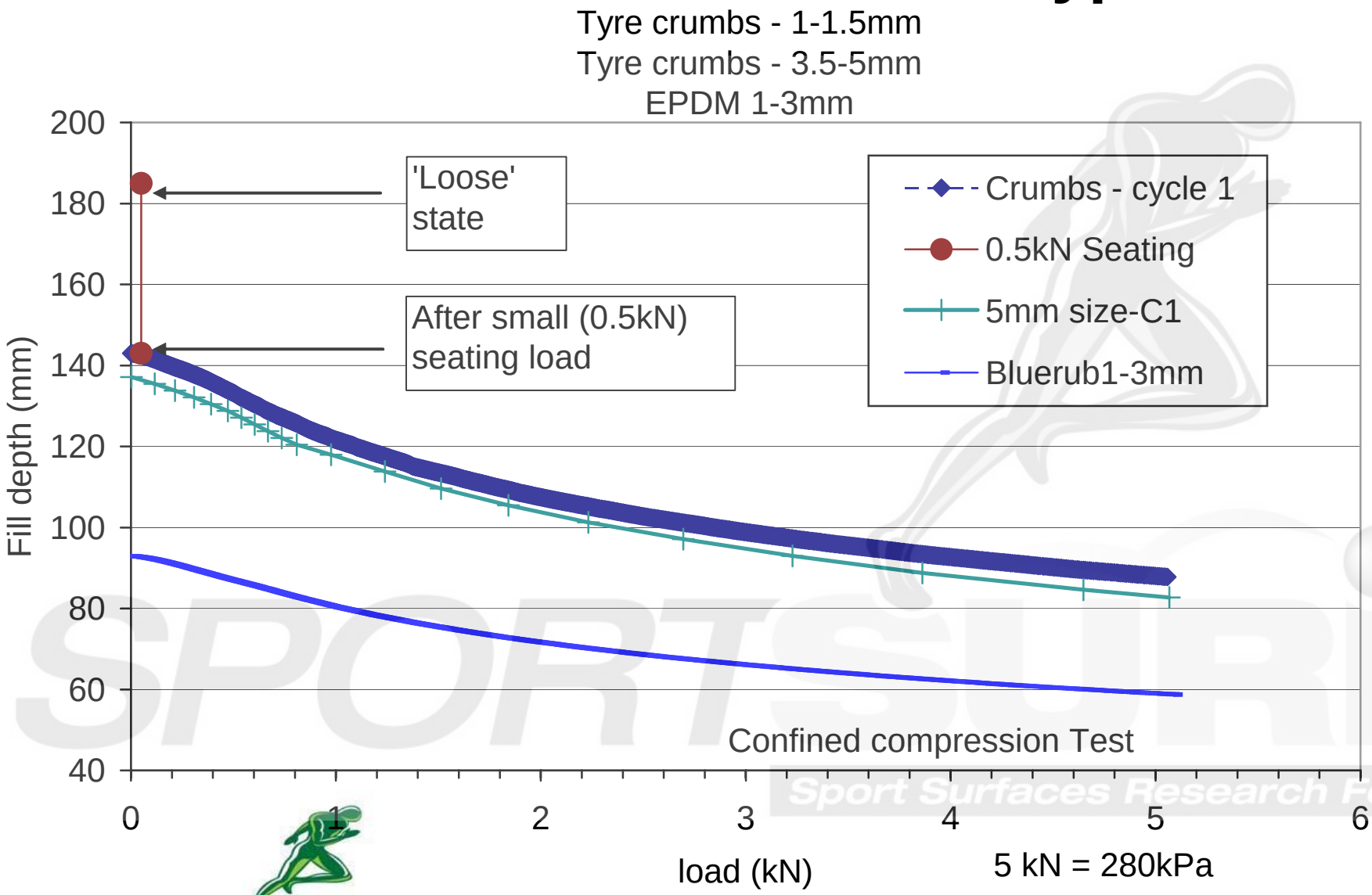
Traction results (Rotational Torque Resistance)

PEC

2003 – Test house	**28 (Range 27 - 29)**
2004 – Project	**25-28**
2004 – Project	**24-32**
College (Dynamic)	**27-30**

	Fill (kg/m^3)			Berlin(Clegg)	
Laboratory	**10**	**a**	**22-24**	**57**	**(130)**
	16	**b**	**24-26**	**62**	**(90)**
	22	**c**	**21-23**	**68**	**(65)**

Fill – Effect of size and type?



Surface Fill - issues

Fill source – cost, quality control/consistency, size range, shape, material type (rubber, sand)

Ease of installation – ‘equilibrium’..?

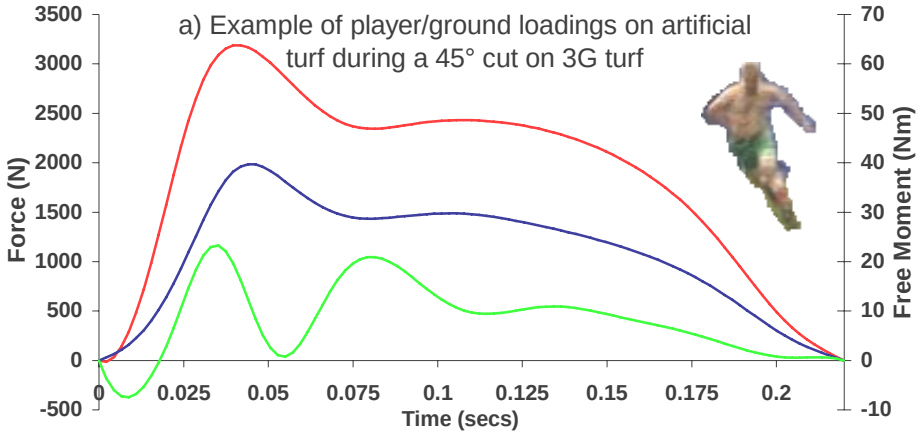
Long-term behaviour – degradation, fouling, compaction, drainage effects

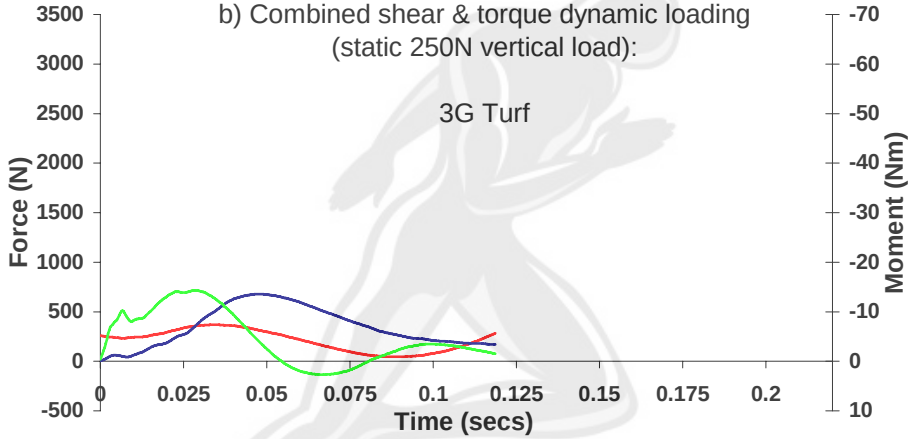
Mechanical properties – test methods?

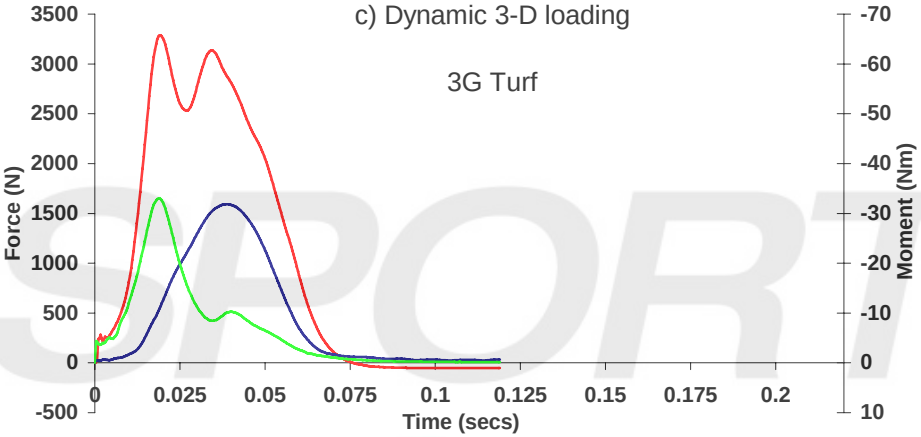
Field Testing

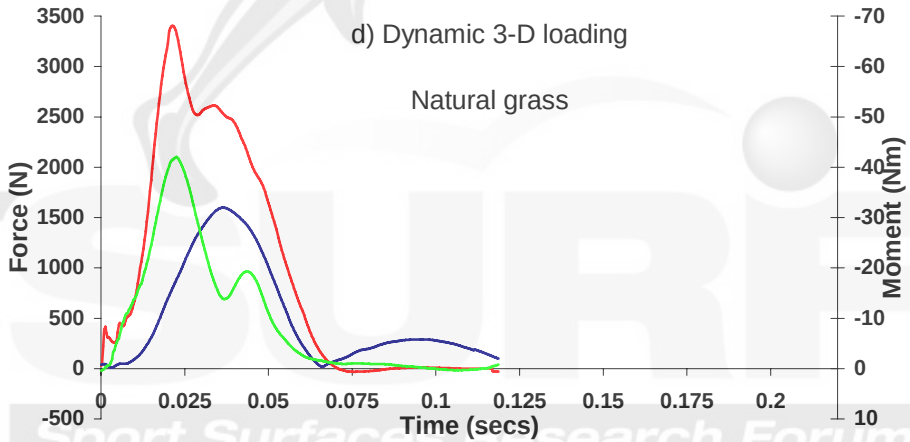
Strathclyde – Research into multifactorial testing regime

Ground loadings during human sports movement(a) and rig testing of a 3G surface (b,c) and a natural grass surface (d)









Vertical Shear Torque

C Walker

Feedback – Morning Session

- ITF guidance under review, classification & tests
- Performance requirements well understood..
- Need for greater interaction between NGBs/IGBs and research/practice to help develop guidance and suitable test methods. (Help?)
- Durability – important, but as yet little ‘research’ knowledge/information is available…(project?)
- Player feedback on surface hardness/grip not yet done – would be useful (project?)
- Guidance from ITF adopted as a ‘standard’. Appropriate?
- Guidance designed for top end of sport, elite level play – suitability for community level (testing, costs etc)

Feedback – Afternoon Session

Natural turf is a suitable benchmark….?
Player feedback has adjusted initial FIFA PP limits
Medical studies…no difference between artificial and natural turf.
QA & Maintenance is the key. What is best practice…is it known and used? Are pitches tested enough?
Community study needed re health effects?
Issues?
Boot – stud configurations……
Water required to be added for abrasion and speed..
Interaction Mechanics understood – linked to injuries?

Closing Remarks

- What happens after today? Keep in contact!
- Future workshops (we want your input!)
- Conference summer 2007
- Web info, newsletter
- Constructive feedback on today and for future sessions please…..
- Future collaborations…..

SAFE JOURNEY HOME!

www.sportsurf.org

Free