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Analisi tribometrica della superficie di Lenti a Contatto

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Contact Lens comfort and Dropout

Clinical Optometry

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REVIEW

A Review of Contact Lens Dropout

This article was published in the following Dove Press journal:
Clinical Optometry

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Purpose: Contact lens (CL) dropout is likely a major factor contributing to the near stagnant growth in the CL market. The purpose of this review is to summarize the current state of knowledge related to the frequency of CL dropout and the factors associated with it.

Methods: PubMed.gov was searched on or before March 22, 2020, with the terms "contact lens" with "dropout" or "cessation" or "disruption" or "discomfort". Pertinent articles were collected. The references from these articles were likewise searched to identify additional relevant articles. Only manuscripts written in English were included. No study design or date exclusions were imposed on this review.

Results: This literature review found that CL dropout was frequent across developed countries, with a CL dropout frequency that ranged between 12.0% and 27.4% (pooled mean = 21.7%). The top cited reason for CL dropout in established CL wearers was discomfort, while vision was the top reason in neophyte CL wearers. If given the chance, CL dropouts are often able to successfully resume CL wear up to 74% of the time. While the literature is mixed with regard to factors promoting CL dropout, meibomian gland dysfunction appears to promote CL dropout.

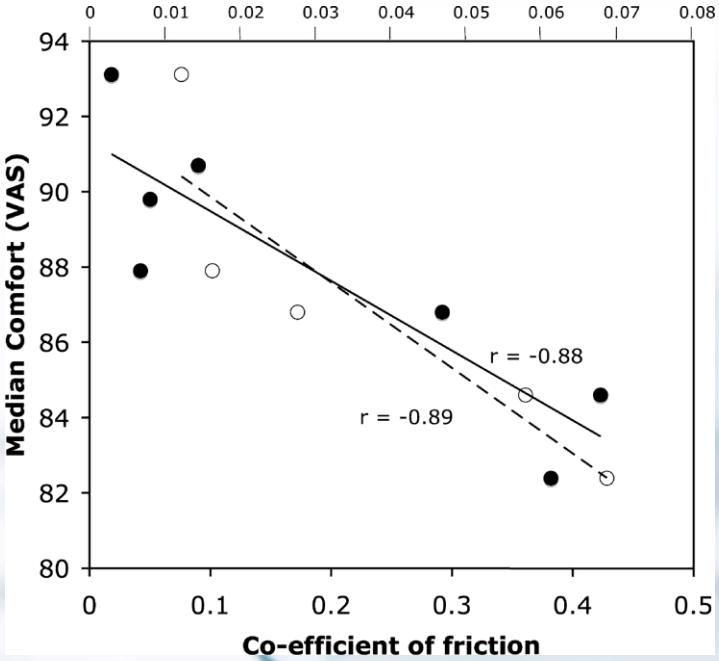
Conclusion: CL dropout is a frequently encountered condition that may be curtailed by early detection, patient education, alterative CL options, or early treatment of underlying ocular surface diseases such as meibomian gland dysfunction.

Keywords: contact lens dropout, contact lens cessation, contact lens dry eye, ocular surface

Contact Lens comfort and Lubricity

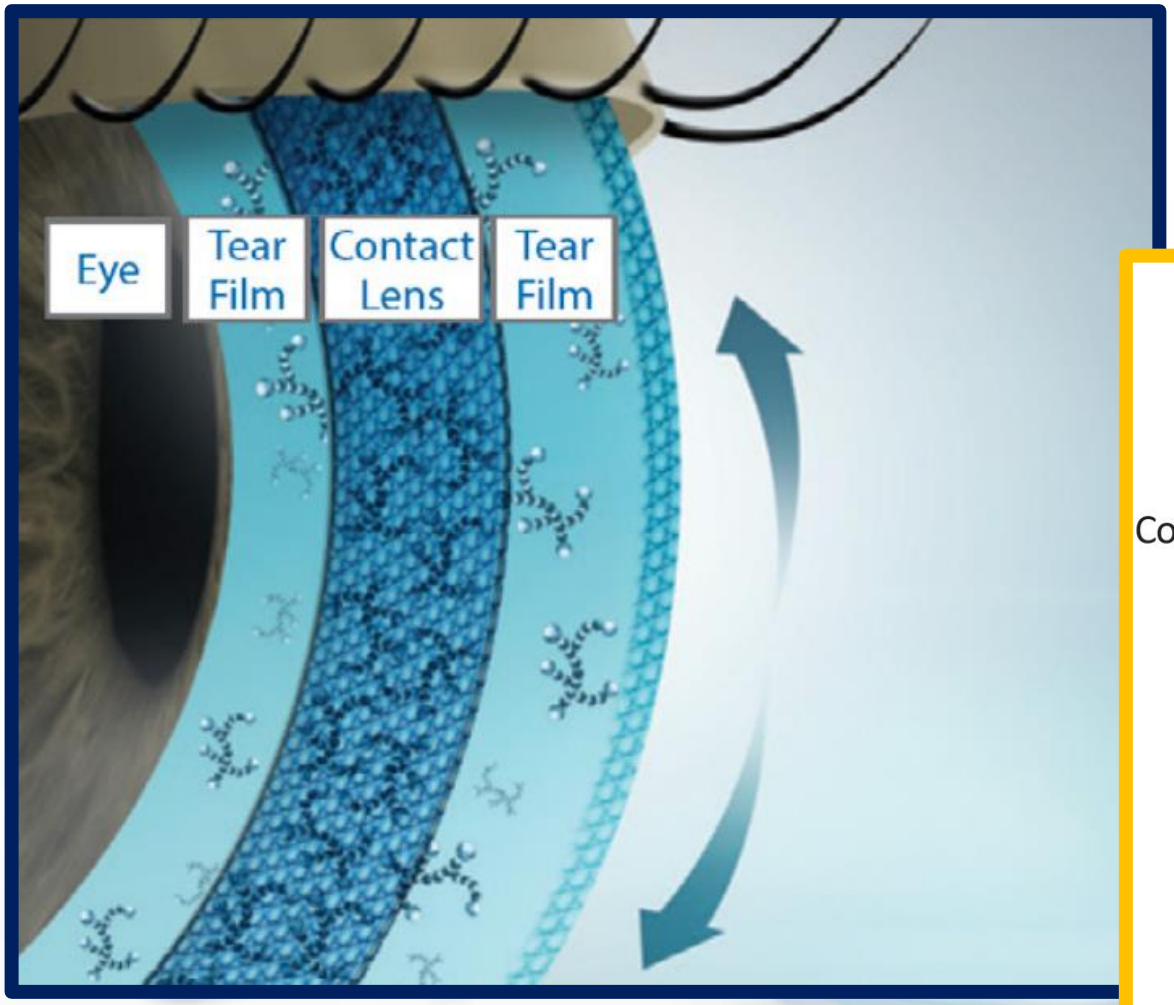
From: The TFOS International Workshop on Contact Lens Discomfort: Report of the Contact Lens Materials, Design, and Care Subcommittee

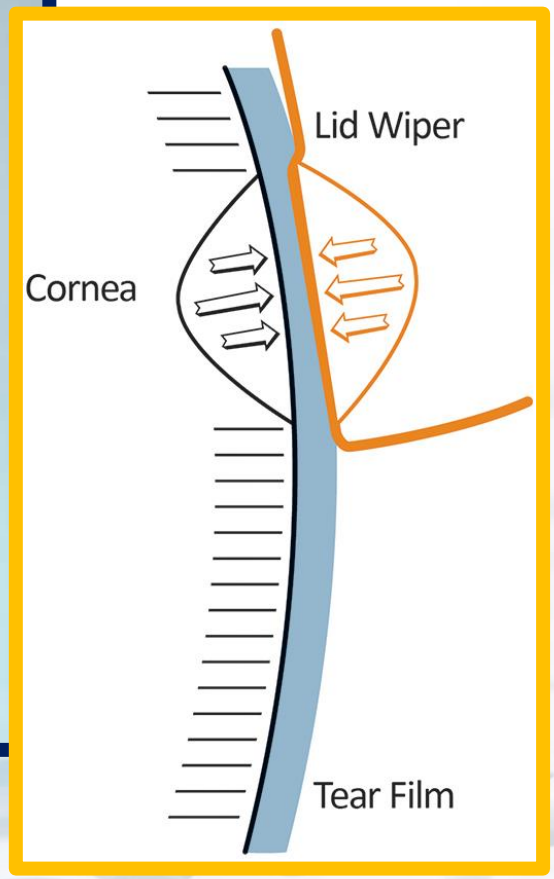
Invest. Ophthalmol. Vis. Sci.. 2013;54(11):TFOS37-TFOS70. doi:10.1167/iovs.13-13215



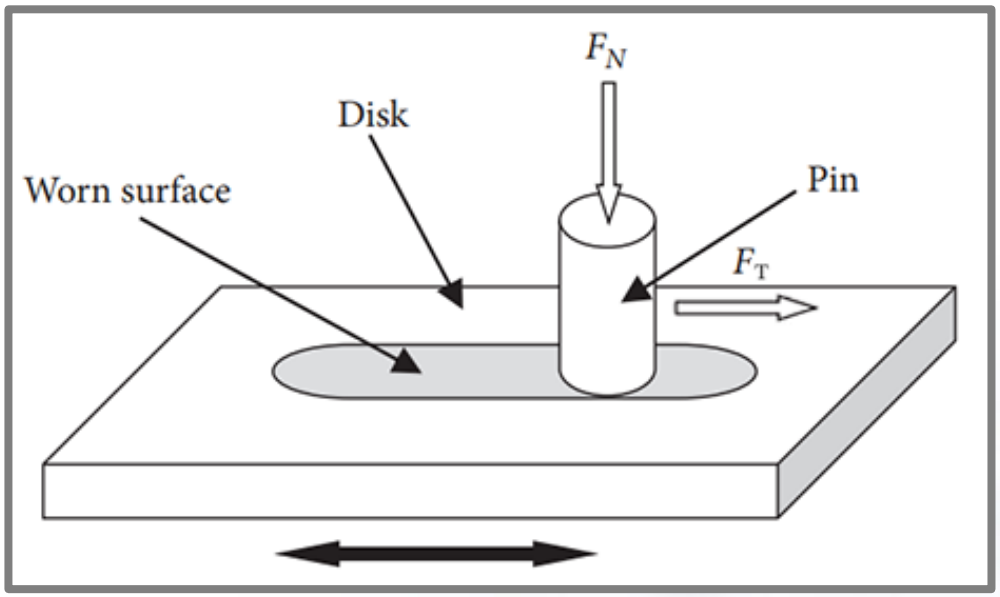
Plot of median end-of-day comfort versus coefficient of friction

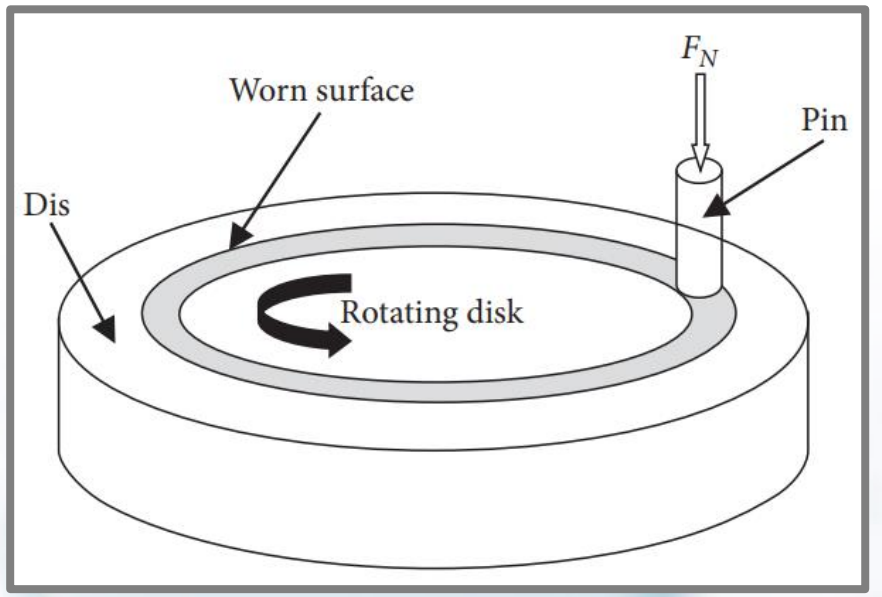
Ocular Tribology





Tribometry

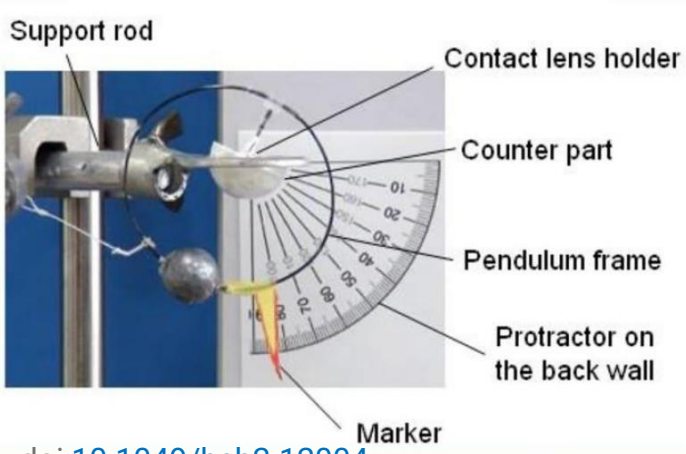




$$\mu\,(CoF) = \frac{F_T}{F_N}$$

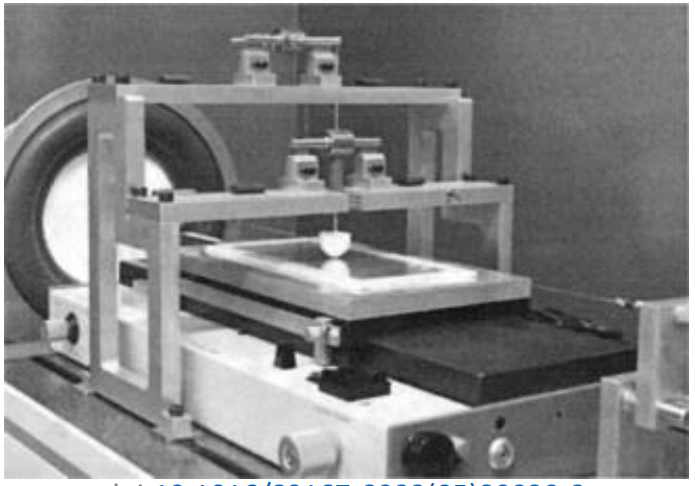
Instruments

Pendulum machine



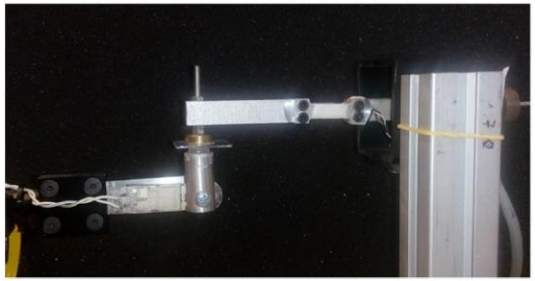
doi:10.1049/bsb2.12004

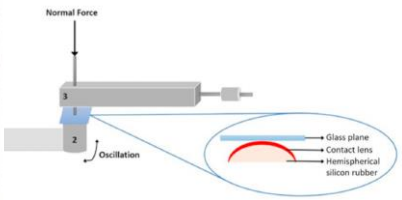
Custom-made friction tester



doi:10.1016/S0167-8922(05)80039-2

Dynamic Tribometer

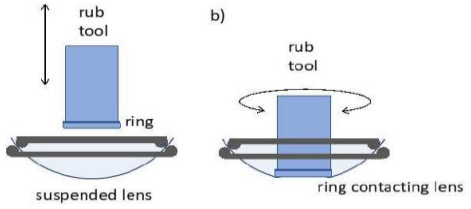




doi:10.1016/j.triboint.2020.106633

Rheometer DHR3

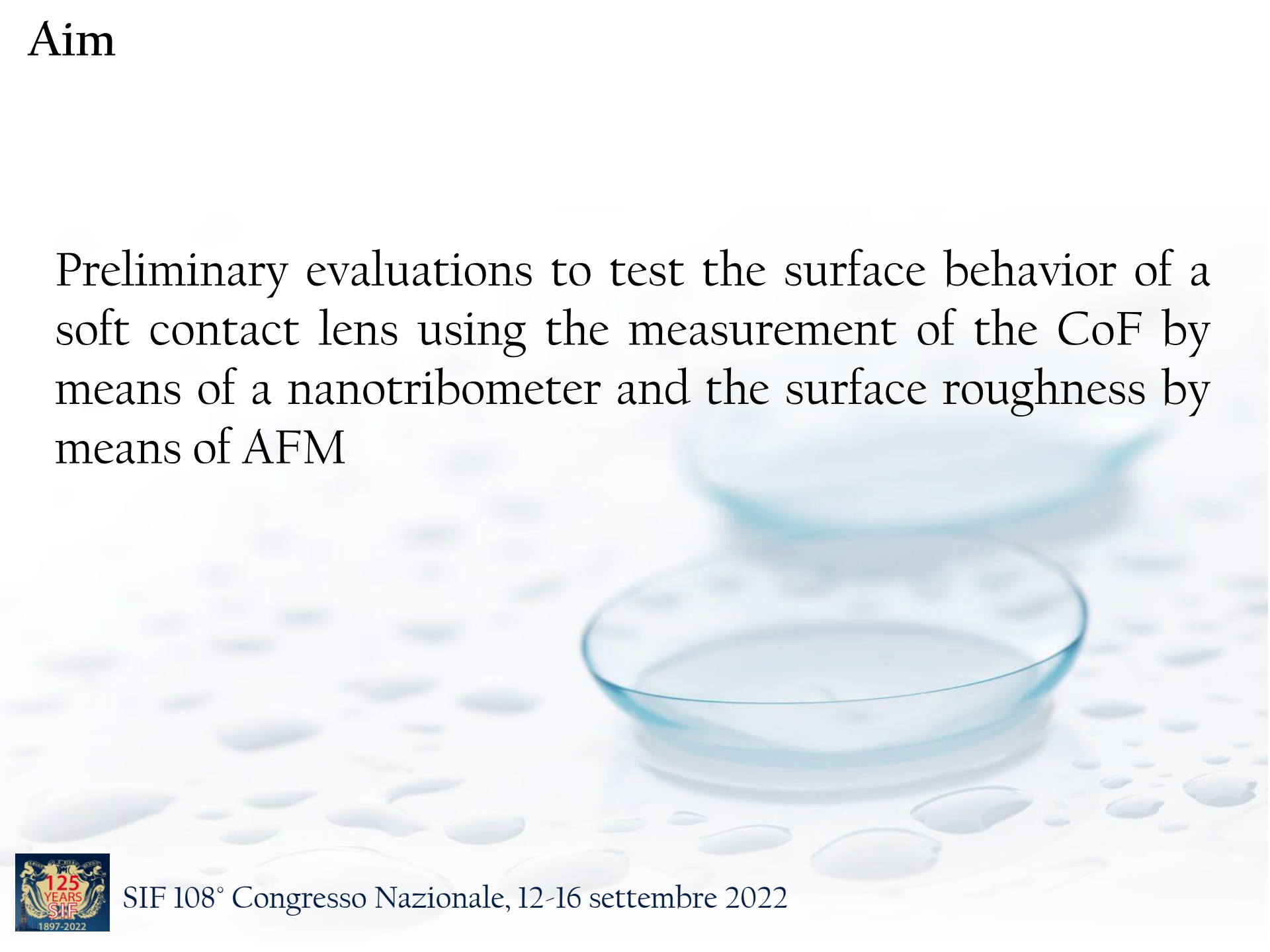
(TA Instruments, New Castle, DE)



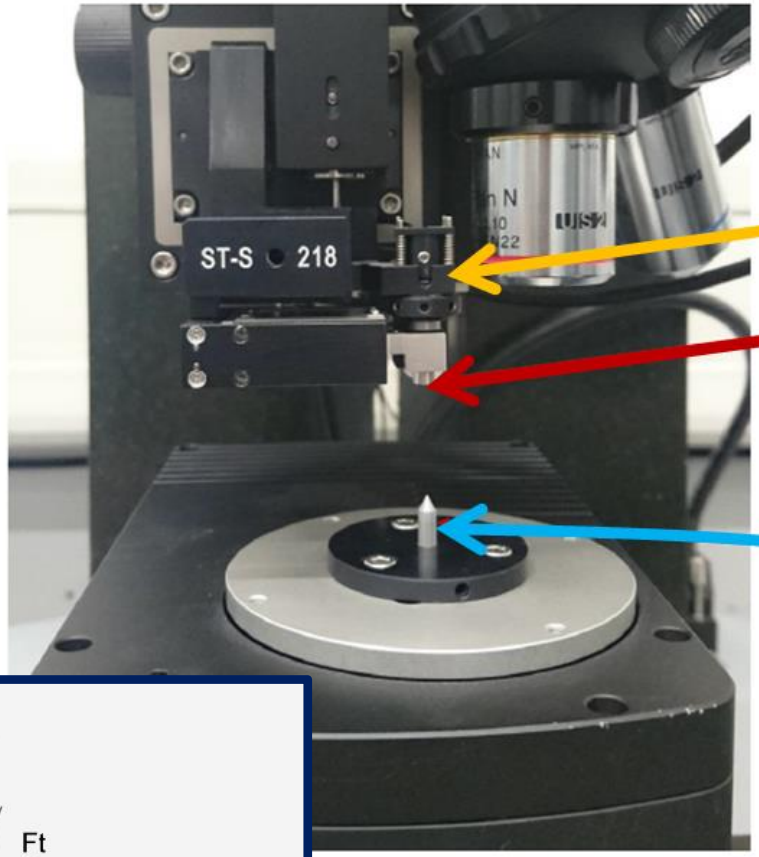
doi: 10.11648/j.ijovs.20190404.16

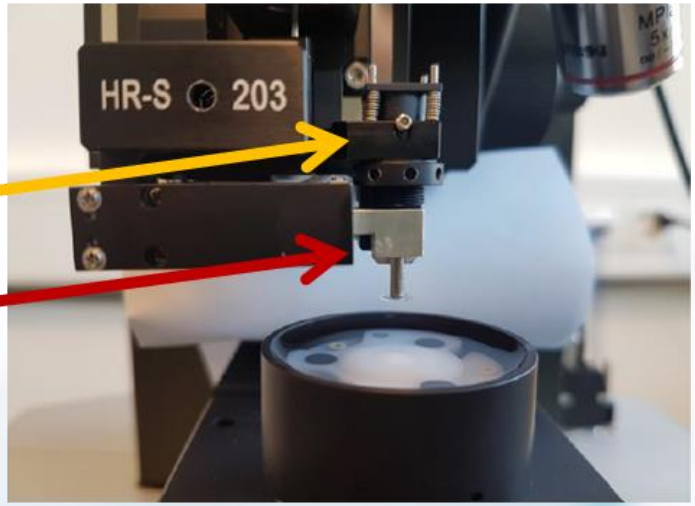
Aim

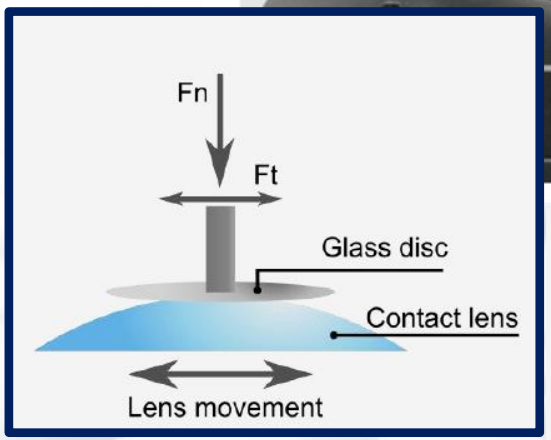
Preliminary evaluations to test the surface behavior of a soft contact lens using the measurement of the CoF by means of a nanotribometer and the surface roughness by means of AFM



Protocolli e parametri



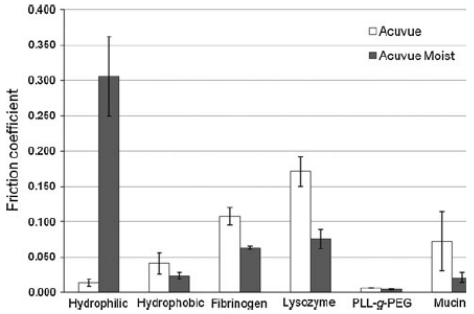




NTR3 Nano Tribometer
(Anton Paar GmbH, Graz, Austria)

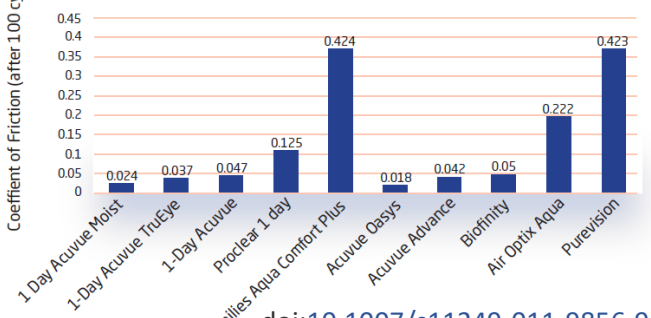
Critical parameters

Type of lubricant



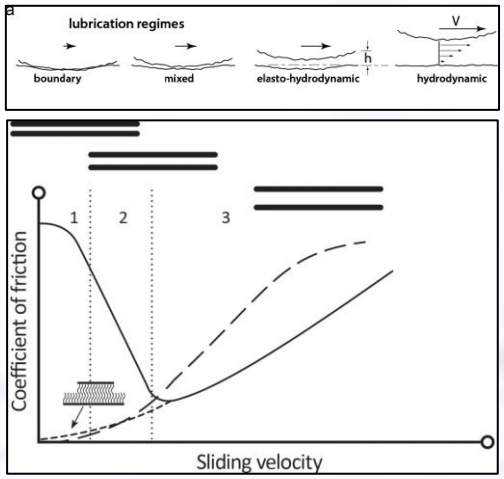
doi:10.1007/s11249-011-9856-9

Materials



doi:10.1007/s11249-011-9856-9

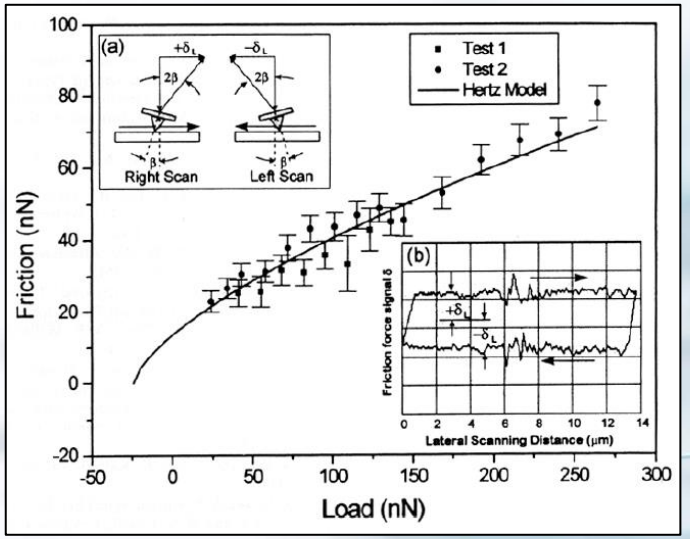
Sliding velocity



v ≈ 10-12 cm/s

doi:10.1016/j.triboint.2013.01.008

Applied normal force

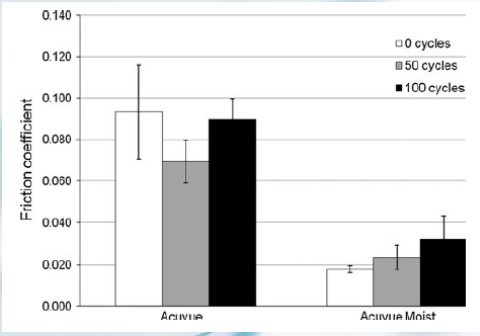


Eyelid Pressure: 1-7 kPa

$F_N \approx 10mN$

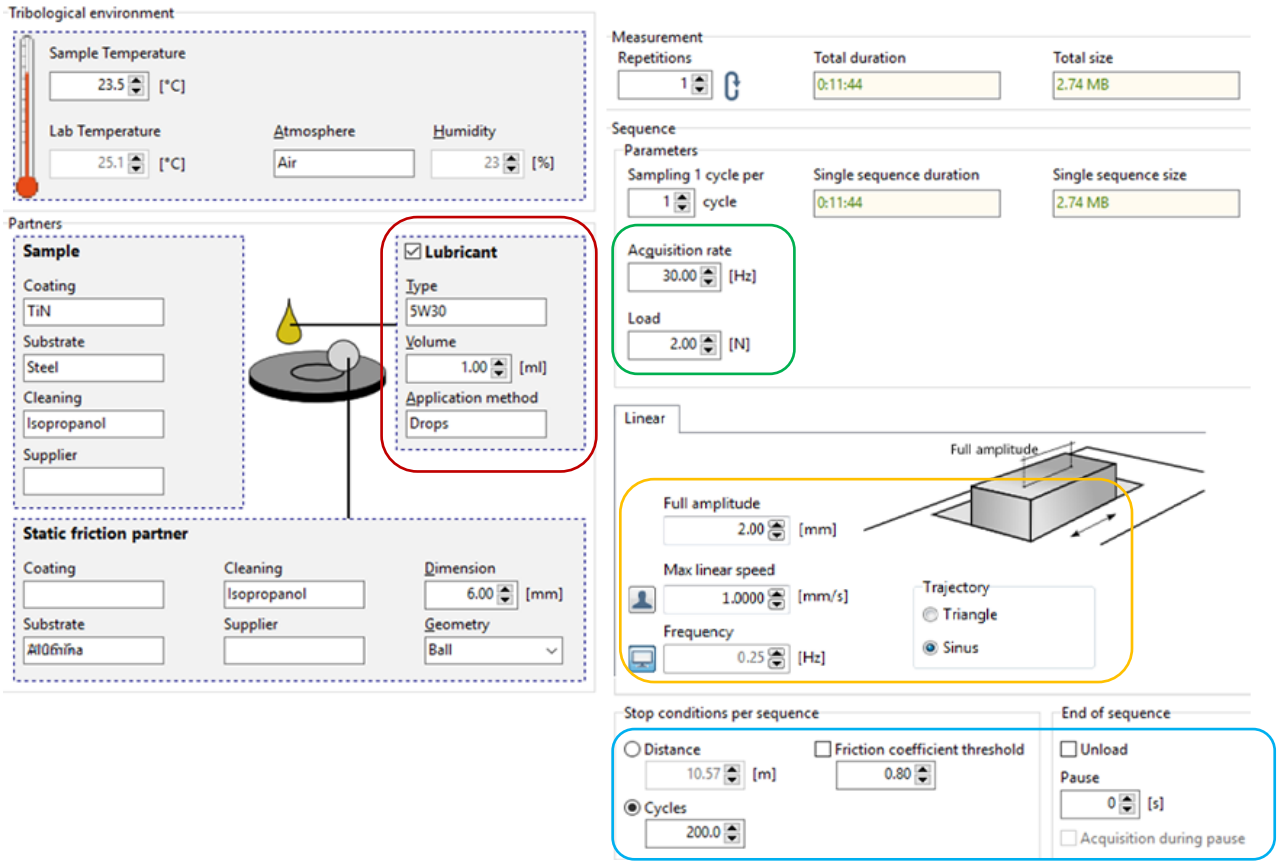
doi:10.1023/A:1016131323735

Cycles Number

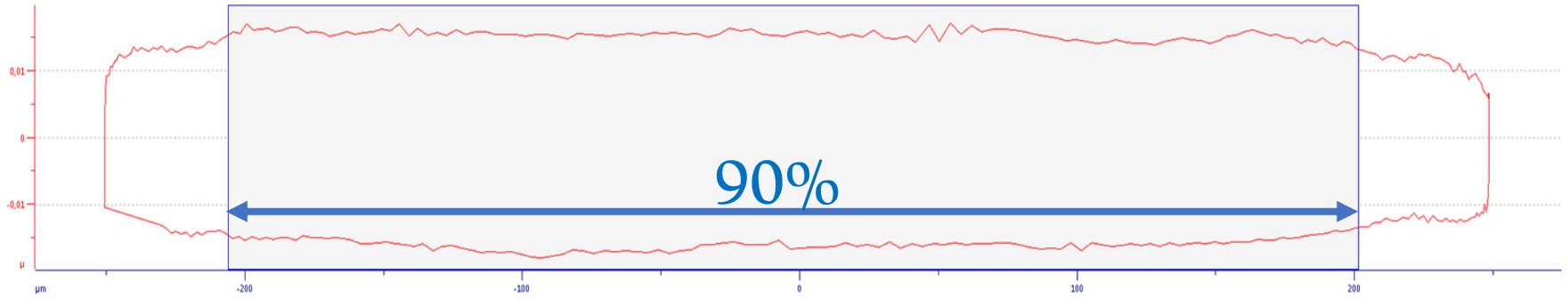


doi:10.1007/s11249-011-9856-9

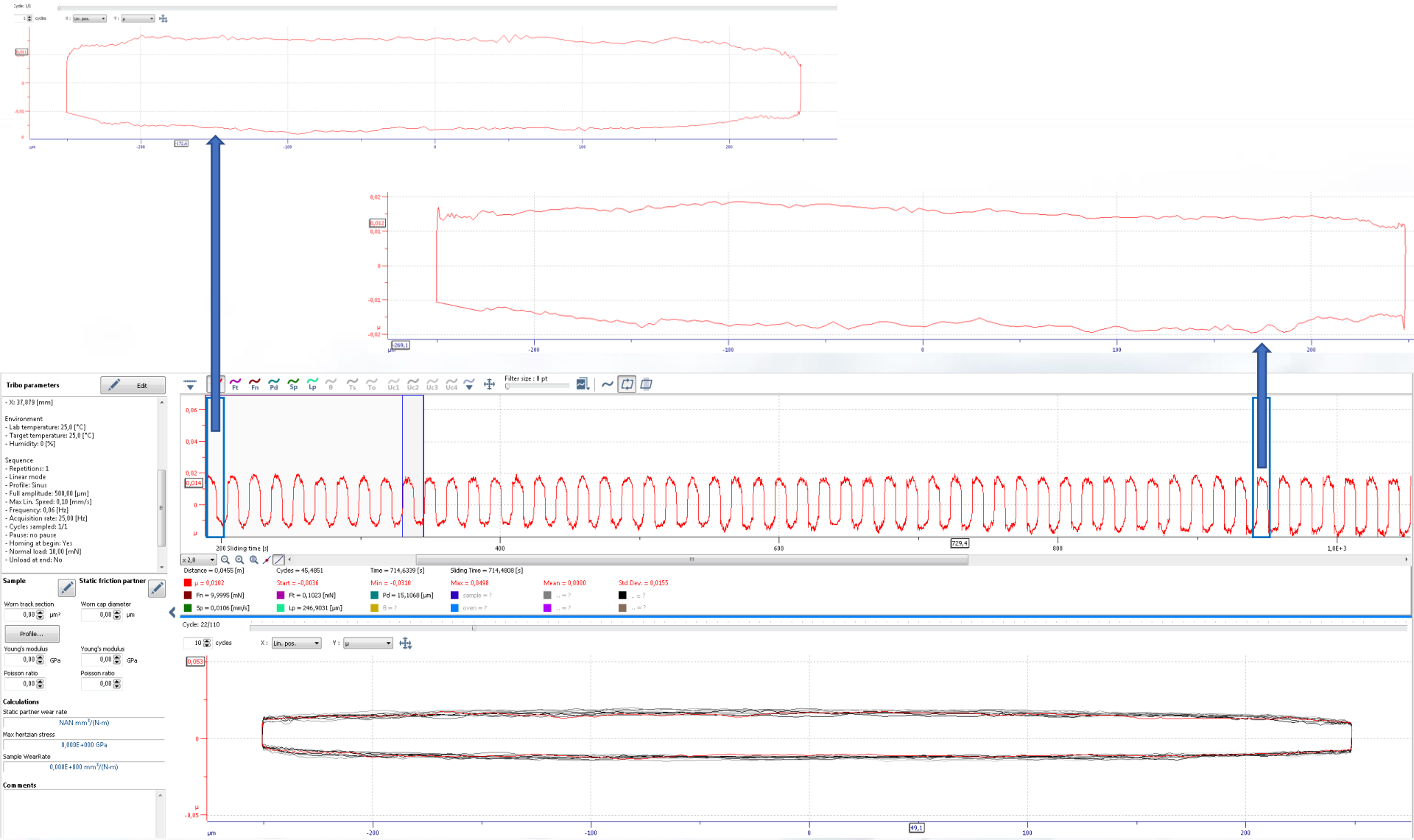
Our protocol: acquisition parameters



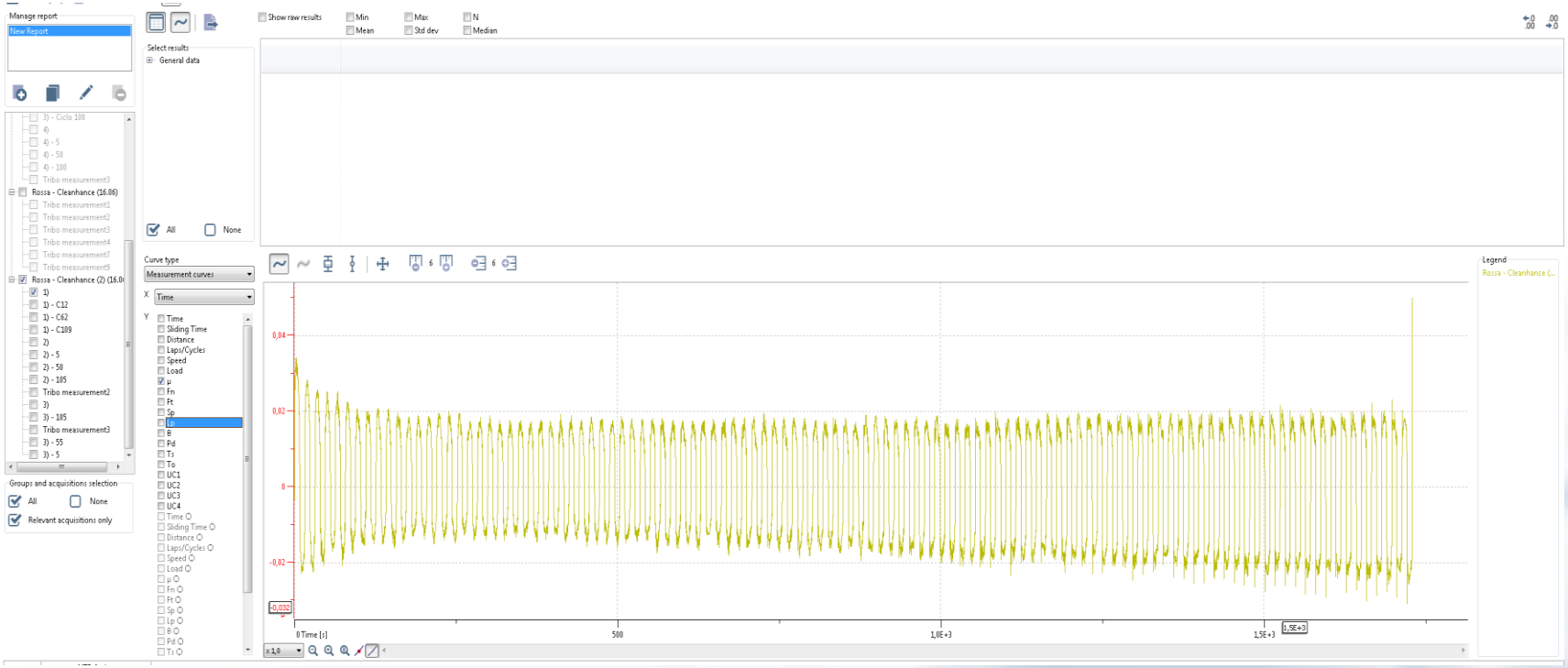
Setted Parameters	
Lubricant	Saline Solution
Applied Load	10 mN
Acquisition rate	25 Hz
Full Amplitude	500 um
Sliding Velocity	0,1 mm/s
Trajectory	Sinus
N° cycles	100

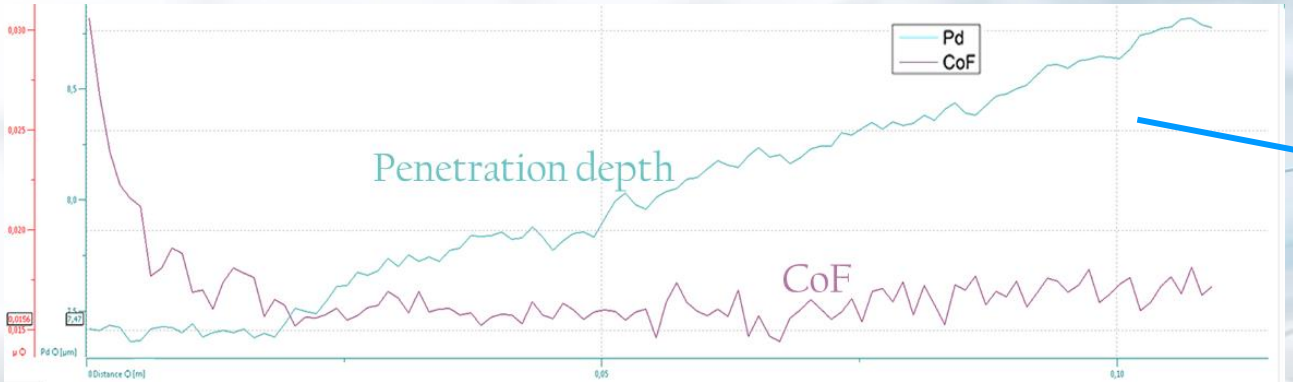


Our protocol: measurements and cycles



Our protocol: measurements and cycles

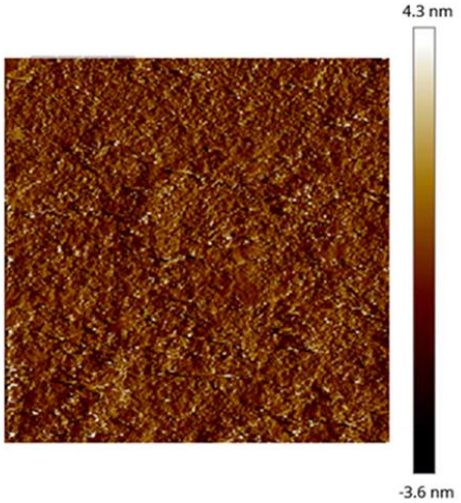


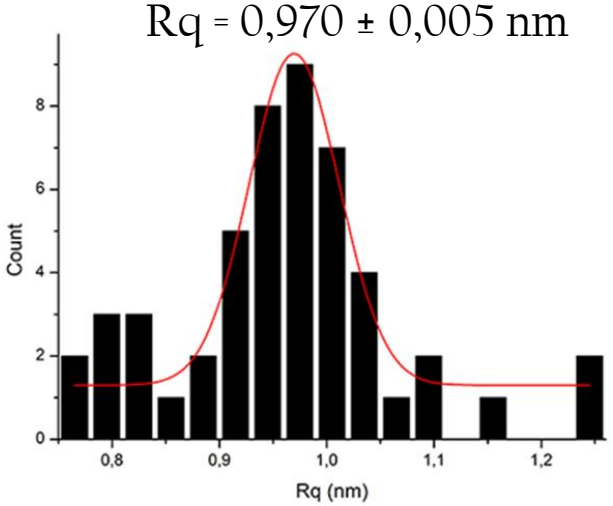


Deformation or wear?

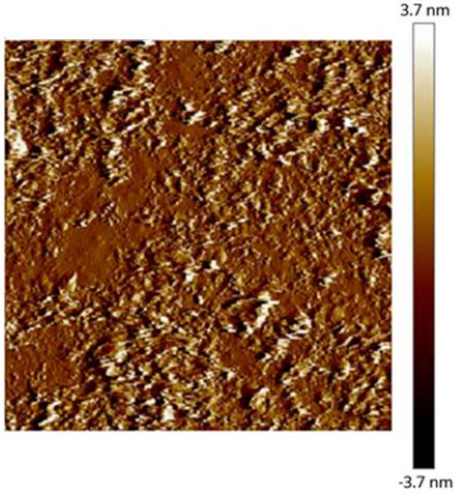
Investigation of Roughness Parameter by AFM studies

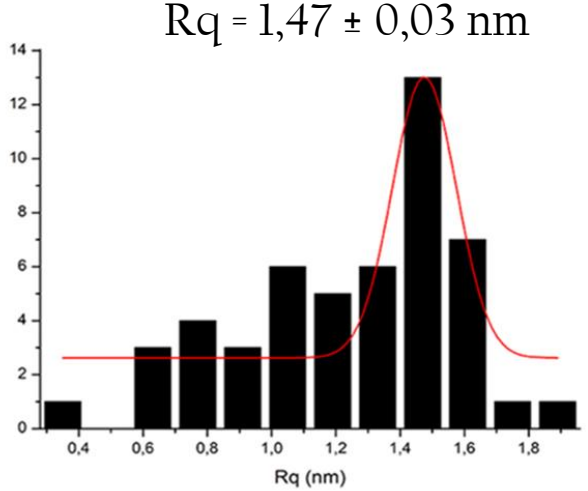
Lens A





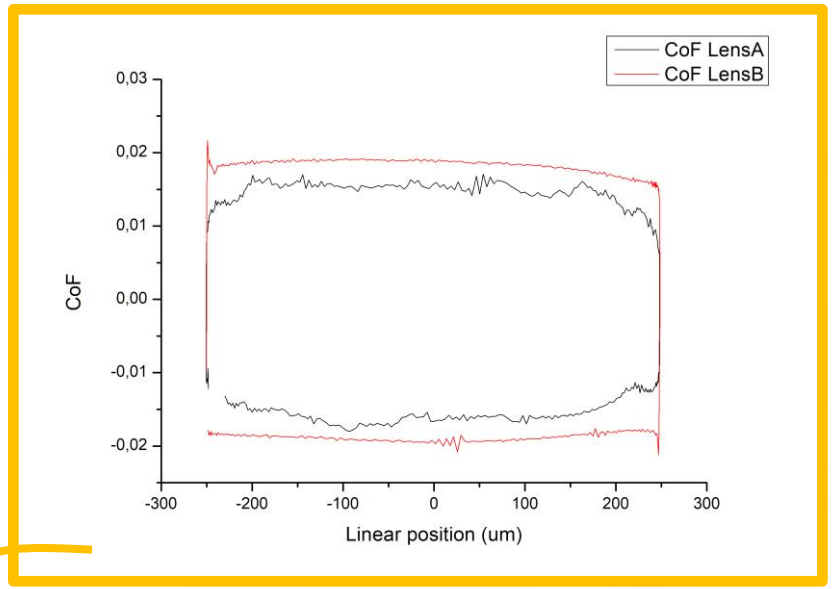
Lens B



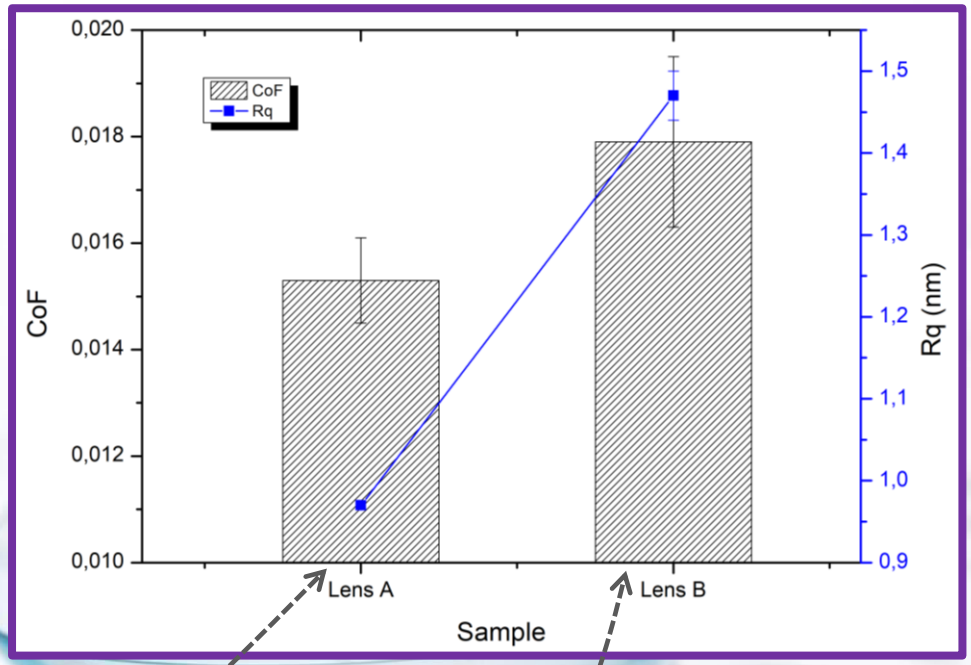


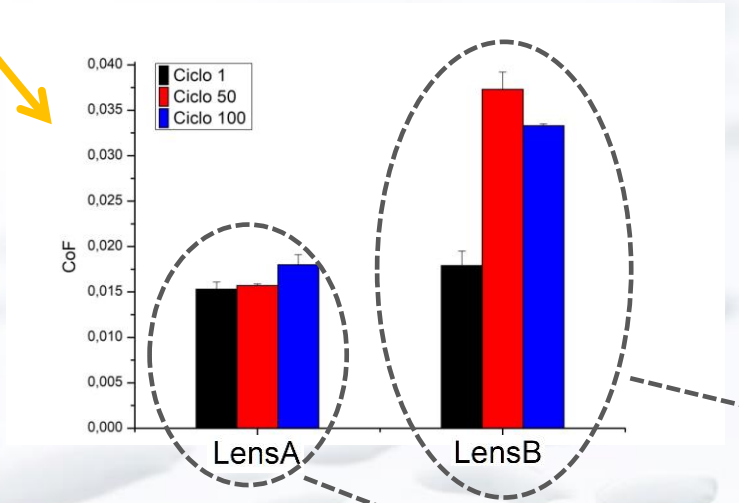
Bruker Bioscope Catalyst AFM

Rq and CoF relation



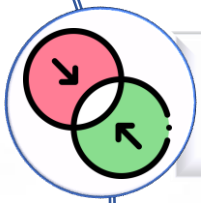
Lens A: Omafilcon B, 65% water content
Lens B: Hema MMA GMA, 55% water content





Future challenges

Systematic studies to evaluate CoF for most used commercial CLs



Classifying CLs according to their CoF and wear rates

Clinical Studies

Statistical analysis of drop out due to CoF CLs parameter

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Following measurements are going to be performed at
CERCA (CEntro di Ricerca in Contattologia Avanzata)
located in the Department of Mathematics and Physics «E. de Giorgi» in Lecce.

THANK YOU
FOR YOUR ATTENTION

UNIVERSITÀ DEL SALENTO
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Dipartimento di Matematica e Fisica
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Dott.ssa Mariafrancesca Cascione
Dott.ssa Francesca Treso
Dott. Daniele Costa
Dott.ssa Valeria De Matteis

Lens A: Omafilcon B, 65% water content Cleanhance Schalcon
Lens B: Hema MMA GMA, 55% water content Skysoft Schalcon