

**22nd International
Conference on Fluid
Sealing 2013**

**Dusseldorf, Germany
3 – 4 December 2013**

ISBN: 978-1-63266-857-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2013) by BHR Group
All rights reserved.

Printed by Curran Associates, Inc. (2014)

For permission requests, please contact BHR Group
at the address below.

BHR Group
The Fluid Engineering Centre
Cranfield, Bedfordshire MK43 0AJ
United Kingdom

Phone: +44 1234 750422
Fax: +44 1234 750074

contactus@bhrgroup.co.uk

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

22nd International Conference on
FLUID SEALING
Düsseldorf, Germany: 3rd – 4th December 2013

CONTENTS

FOREWORD	1
KEYNOTE ADDRESS	
HydrauLeaks? Meeting the changing perceptions of fluid power equipment in earthmoving machinery <i>H Narotham, JCB Excavators Ltd, UK</i>	3
GENERAL	
Regulations motivate low-emissions sealing – a summary of world air pollution rules and USA leak detection and repair <i>J Drago, Garlock Sealing Technologies Palmyra, USA</i>	7
Sealing solutions for water hydraulic actuators in the sanitary valve industry <i>M Fairhurst, R Collins, BHR Group, UK</i>	21
Nanostructured tungsten carbide coating improves seal life in abrasive applications and enables high temperature seals <i>Y N Zhuk, Hardide plc, UK</i>	33
The Flexitallic Change Gasket: A new semi metallic gasket configuration to improve bolted joint connections <i>S Bond, The Flexitallic Group, USA</i>	49
Introduction to BFP/P112 'Guidelines on seals for fluid power applications including care and handling' <i>N A Peppiatt, Hallite Seals International Ltd, UK</i>	61

MECHANICAL SEALS

- Heat transfer analysis in two-side heat transferring mechanical seals using straight fin theory 65
P Song, F Zhang, W Chan, Kunming University of Science and Technology, China
- Use of carbon based coatings to enhance mechanical seal performance 73
C H Walker, Diamond Hard Surfaces Ltd, UK

RECIPROCATING SEALS

- An experimental study on hydrodynamic film formation of reciprocating seals 89
K Yoshimura, N Suzuki, H Mizuta, NOK Corporation, Japan
- Model based surface topography design of pneumatic applications for improved friction properties 99
M Wangenheim, M Zimmermann, Leibniz Universität Hannover; A Hermann, Freudenberg Sealing Technologies (FST) GmbH & Co. KG, Germany

ROTARY SHAFT LIP SEALS

- Investigation into contact band characteristics of rotary radial lip seals in relation to various operating parameters 117
M-A Matzakou, P Bowman, James Walker & Co. Ltd, UK
- Investigations into protective seals for ball bearings 131
K Ottink, G W G Poll, Leibniz Universität Hannover, Germany
- Revisiting soft micro-elastohydrodynamic lubrication: A FEM-based multi-scale approach for modeling radial lip seal friction 147
B Wennehorst, G W G Poll, Leibniz Universität Hannover, Germany
- Evaluation of the surface texture of sealing counterfaces for radial lip seals based on 3D surface parameters 161
C Fehrenbacher, F Bauer, W Haas, University of Stuttgart; M Narten, Renk AG, Germany
- Comprehensive lead analysis of shaft counterfaces for the tribological system radial lip seal 175
M Baumann, F Bauer, W Haas, University of Stuttgart, Germany

AUTHOR INDEX