



Multi-Purpose Maintenance Fluids – Penetration Efficacy Technical Assessment

Introduction

Comparison of the penetrative performance of general purpose maintenance fluids was required. The performance of various products was tested, and compared to that of the two XCP™ Professional general purpose maintenance fluid formulations, XCP™ ONE and XCP™ Green ONE. The alternative products tested were:

PlusGas Formula A	Saint-Gobain Abrasives
AC90	Action Can Ltd
Sonax SX90 PLUS	Sonax GmbH
WD40	WD40 Company
Muc-Off MO94	Muc-Off Ltd
GT85	GT85 Ltd
Liquid Wrench Penetrating Oil	RSC Chemical Solutions
PB B'laster Penetrant	Blaster Corporation

Procedure

The fluids were tested using in-house standard operating procedures for penetrative properties.

Penetration efficacy is measured by determining the torque required to release a bolt that has been rusted into a steel block using a standard repeatable technique and then subsequently treated with the test product.

Mild steel test blocks are prepared with a thread tapped from a circular well cut into the top face. The threaded section is filled with salt water of known concentration for 24 hours. The threaded portion of a mild steel hexagonal-head bolt is immersed in salt water of a matched concentration for 24 hours. After the 24 hour storage period, the salt water is discarded and the hex bolt is tightened into the steel test block to a measured torque. The block and bolt are then left to stand at ambient temperature for 48 hours.

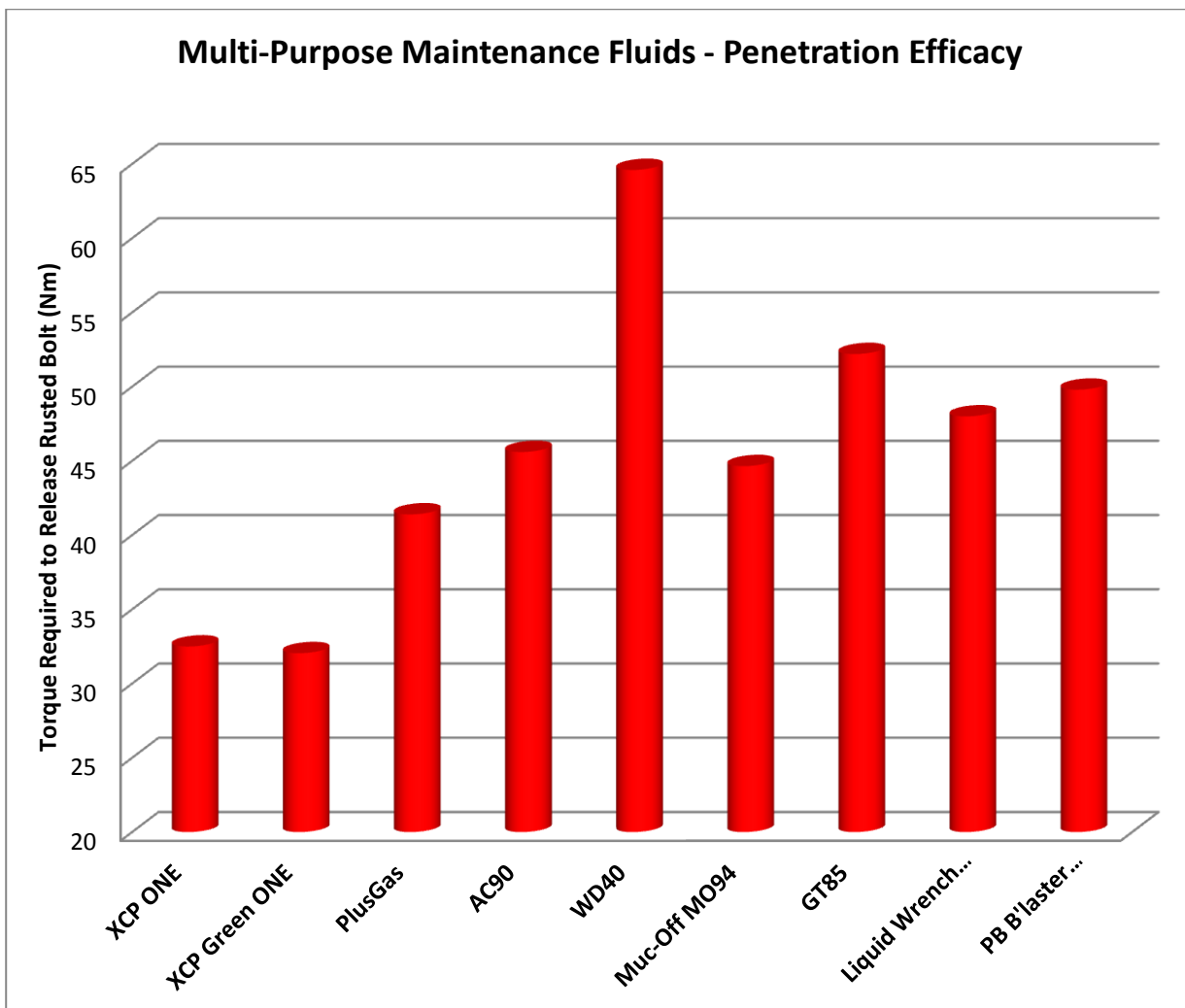
A known volume of the test product is then introduced into the well around the hex bolt head and the block is left to stand at ambient temperature for a 7 day test period. The torque required to release the bolt head from the block is then measured.

Results

Penetration

The results obtained with the range of multi-purpose maintenance fluids are shown below and compared with those obtained with the XCP Professional ONE and Green ONE formulations. The values given are for the torque required to release the rusted bolt from the steel test block.

Product	Torque (Nm)	Torque (pound feet)
XCP ONE	32.5	24.0
XCP Green ONE	32.0	23.6
PlusGas Formula A	41.4	30.6
AC90	45.6	33.6
WD40	64.6	47.6
Muc-Off MO94	44.6	32.9
GT85	52.2	38.5
Liquid Wrench Penetrating Oil	48.0	35.4
PB B'laster Penetrant	49.8	36.7



Conclusion

It can be seen from the results shown above that both XCP™ ONE and XCP™ Green ONE show a marked improvement in penetrative performance when evaluated against that provided by the alternative products tested.

The information contained herein this technical report is confidential and the original intended recipient(s) shall not divulge or disclose the confidential information or any part of it or extracts from it to any third party without receiving prior written consent from Marott Graphic Services (UK) Limited.