

## BRIEFING NOTE

# Withdrawal of AeroShell Grease 17 and replacement with AeroShell Grease 33MS

### Background

*AeroShell Grease 17 (ASG 17)* comprises 95% *AeroShell Grease 7 (ASG 7)* with 5% molybdenum disulphide ( $\text{MoS}_2$ ), a solid lubricant added to provide extreme pressure (EP) properties to the grease, for use in heavily loaded, sliding applications.

ASG 7 is approved to the MIL-PRF-23827C specification as a Type II grease because it has a clay (Microgel®) thickener. This is the only clay-thickened grease on QPL-23827; all\* the competitor greases are Type I with a lithium soap thickener. ASG 7 used to be approved to DEF STAN 91-53, but when the UK MoD changed this specification to exclude clay-based greases, this approval was withdrawn.

ASG 17 is approved to the MIL-G-21164D specification and, as with ASG 7, it is the only clay-based grease on QPL-21164, all\* the other approved greases being based on lithium soap. ASG 17 used to be approved to DEF STAN 91-57, but when this specification was also changed to exclude clay-based greases, approval for ASG 17 was withdrawn.

(\* Note the BP/Castrol greases listed on the two US MIL QPLs are rebrands of ASG 7 and ASG 17).

### Recent Developments

There is a widespread trend across many industries, not just in aviation, to move away from clay-based greases in favour of lithium complex technology. Whilst clay-based greases and, in Shell's case, Microgel® greases have served industry well for many decades, the ability to incorporate more effective additive packages in greases using Li-complex technology is seen as a growing advantage. With many specifications now restricting the composition to non-clay thickeners, grease manufacturers have no choice but to migrate to Li-complex technology.

A high-profile example of this trend was Boeing's development of the BMS 3-33 specification for a general purpose (GP) airframe grease with added anti-corrosion and anti-wear properties, based specifically on Li-complex technology. Shell worked closely with Boeing during this period and developed *AeroShell Grease 33*, which was the first grease to be approved to this specification and remained the only approved grease for many years. To widen its field of application beyond Boeing aircraft, Shell also gained MIL-PRF-23827C (Type I) approval for ASG 33; this approval allows its use on many other aircraft types. The latest approval gained is to the new Airbus standard, AIMS-09-06-002, where ASG33 is the first approved grease.

Using BMS 3-33 as a starting point, a new GP airframe grease specification has now been developed by SAE; both Boeing and Airbus will adopt the SAE 3052 specification as their standard airframe grease.

## AeroShell Grease 33MS

Although Boeing's aim in developing BMS 3-33 was to have a single grease that could be used in the majority of airframe applications where several different greases were previously used, there remain a small number of heavily-loaded, sliding applications, where the additional boost of MoS<sub>2</sub> will always be required. It was a logical decision, therefore, to formulate an EP version of ASG 33 to address this continuing need. This product is ASG 33MS and is approved to both MIL-G-21164D and DEF STAN 91-57 specifications. As with the ASG 7/ASG 17 combination, ASG 33MS is simply ASG 33 with 5% added MoS<sub>2</sub>. ASG 33MS also benefits from the exceptional anti-corrosion and anti-wear properties of ASG 33.

Product		Thickener Type	Specification
AeroShell Grease 7		Clay - Microgel®	MIL-PRF-23827C (Type II)
AeroShell Grease 17	AeroShell Grease 7 with 5% MoS <sub>2</sub>	Clay - Microgel®	MIL-G-21164D
AeroShell Grease 33		Lithium-complex	MIL-PRF-23827C (Type I)
AeroShell Grease 33MS	AeroShell Grease 33 with 5% MoS <sub>2</sub>	Lithium-complex	MIL-G-21164D

## Why discontinue AeroShell Grease 17?

Because the number of airframe applications requiring MoS<sub>2</sub>-containing greases is small, compared with those lubricated by general purpose airframe grease, it follows that the volume of ASG 17 manufactured is small compared with other greases in the AeroShell range. This volume is expected to get even smaller as ASG 33MS replaces ASG 17 in airline service. Just as ASG 33 has replaced ASG 7 and other MIL-PRF-23827C (and some MIL-PRF-81322F) greases, as it benefits have been recognised by the aircraft operators, so we would expect ASG 33MS to replace ASG 17 and other MIL-G-21164D greases as its superior performance and complete compatibility with ASG 33 is recognised.

In the interests of manufacturing efficiency, therefore, it does not make sense to make ASG 33MS in addition to a shrinking volume of ASG 17; consequently, the decision has been made to phase out ASG 17 in favour of ASG 33MS. Production of ASG 17 will cease by mid 2005. A stockpile will be laid down so that we can continue to supply customers and allow a managed transition from ASG 17 to ASG 33MS. It is anticipated that toward the end of 2006, ASG 17 will be no longer available.

Note that, because of its large volume and much wider range of application, there are no immediate planes to phase out ASG 7.

## Changing from ASG 17 to ASG 33MS

When changing from (clay-based) ASG 17 to (Li-complex based) ASG 33MS, the normal rules applying to grease changing should be applied. Please refer to Briefing Note "Compatibility and Intermixing of Greases".

Shell Aviation Ltd.  
Shell Centre  
London SE1 7NA