



# AeroShell Grease 33

## *Synthetic grease for aircraft*

AeroShell Grease 33 is a synthetic universal airframe grease composed of a lithium complex thickened synthetic base oil with corrosion and oxidation inhibitors and load carrying additives.

The useful operating temperature range is  $-73^{\circ}\text{C}$  to  $+121^{\circ}\text{C}$ .

### DESIGNED TO MEET CHALLENGES

#### Main Applications

- For many years aircraft operators have been seeking to rationalise the greases used on aircraft and to reduce the number of different greases in their inventories. Recently Boeing began research on a new, general purpose, corrosion-inhibiting grease. The aim was for a non-clay based grease that would provide longer life for components and mechanisms and possess improved wear and corrosion resistance. This led to the introduction of the new Boeing Specification BMS 3-33.
- Owing to the wide range of operating temperatures, loads and other environmental conditions required for various aircraft components, several different types of grease with different desirable properties are used during routine lubrication of aircraft components. Boeing, in developing their BMS 3-33 specification, took account of the properties of the different grease types used on aircraft and wrote a specification for a grease which would provide improved performance and which could be used in the widest possible range of grease applications.
- AeroShell Grease 33 is approved to BMS 3-33C and offers the improved performance properties required by this specification.
- AeroShell Grease 33 can be used for routine lubrication on Boeing aircraft where MIL-PRF-23827C or BMS 3-24 is specified. AeroShell Grease 33 can also be used in some applications on Boeing aircraft which require use of MIL-G-21164. Other applications on Boeing aircraft which require use of MIL-G-21164 and other greases are being reviewed and in due course Boeing will issue details of the full range of applications. For the current status, refer to the latest issue of Boeing Service Letter "BMS 3-33C General Purpose Aircraft Grease".
- AeroShell Grease 33 can be used for routine lubrication in applications where MIL-PRF-23827C is specified on aircraft manufactured by McDonnell Douglas, Airbus, BAe Regional Aircraft, Canadair, Lockheed, Embraer, Fokker and Gulfstream (except for wheel bearings, applications above  $121^{\circ}\text{C}$  and sliding applications requiring molybdenum disulphide).
- Other aircraft manufacturers are evaluating AeroShell Grease 33 with the aim of approving it for use on their aircraft. Operators should regularly check with these manufacturers for the latest status.
- Use of AeroShell Grease 33 can provide operators with the following benefits:
  - Reduced inventories;
  - Reduced maintenance labour costs;
  - Less chance of product mis-application.

#### Specifications, Approvals & Recommendations

- BMS 3-33C
  - MIL-PRF-23827C (Type I)
  - AIMS 09-06-002
  - COMAC QPL-CMS-OL-302
  - SAE AMS 3052
  - NATO Code G-354
- For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

#### Compatibility & Miscibility

- AeroShell Grease 33 contains a synthetic oil and must not be used with incompatible seal materials.

## Typical Physical Characteristics

| Properties                                                  |        |                    | Method     | BMS 3-33C                     | Typical                       |
|-------------------------------------------------------------|--------|--------------------|------------|-------------------------------|-------------------------------|
| Oil type                                                    |        |                    |            | Synthetic Hydrocarbon / Ester | Synthetic Hydrocarbon / Ester |
| Colour                                                      |        |                    |            | Blue-green                    | Green                         |
| Thickener type                                              |        |                    |            | Lithium Complex               | Lithium Complex               |
| Base Oil viscosity                                          | @-40°C | mm <sup>2</sup> /s | ASTM D445  |                               | 1 840                         |
| Base Oil viscosity                                          | @40°C  | mm <sup>2</sup> /s | ASTM D445  |                               | 14.2                          |
| Base Oil viscosity                                          | @100°C | mm <sup>2</sup> /s | ASTM D445  |                               | 3.4                           |
| Useful operating temperature range                          | °C     |                    |            | -73 to +121                   | -73 to +121                   |
| Dropping point                                              | °C     |                    | ASTM D556  | 205 min                       | 227                           |
| Worked penetration                                          | @25°C  |                    | ASTM D217  | 265 to 315                    | 297                           |
| Bomb Oxidation pressure drop from 758 kPa (110 psi) 100 hrs | @99°C  | kPa (psi)          | ASTM D942  | 70 (10) max                   | 3.5 (0.5)                     |
| Bomb Oxidation pressure drop from 758 kPa (110 psi) 500 hrs | @99°C  | kPa (psi)          | ASTM D942  | 105 (15) max                  | 34 (5)                        |
| Oil separation 30 hrs                                       | @100°C | %m                 | ASTM D6184 | 8 max                         | 2                             |
| Water Washout                                               | @79°C  | %m                 | ASTM D1264 | 7.5 max                       | <6                            |
| Evaporation loss 500 hrs                                    | @121°C | %m                 | ASTM D2595 | 10 max                        | <10                           |
| Anti-friction bearing performance                           | @121°C | hrs                | ASTM D3336 | 1000 min                      | >1 200                        |
| Load Carrying Capability LWI                                | @27°C  | kg                 | ASTM D2596 | 60 min                        | >60                           |
| Copper corrosion 24 hrs                                     | @100°C |                    | ASTM D4048 | 1B max                        | Passes                        |

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

## Health, Safety & Environment

### • Health and Safety

AeroShell Grease 33 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

Guidance on Health and Safety is available on the appropriate Safety Data Sheet, which can be obtained from <https://www.epc.shell.com/>

Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

### • Protect the Environment

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

## Additional Information

### • Advice

Advice on applications not covered here may be obtained from your Shell representative.