EW EQUIPMENT & SYSTEM APPROVAL PROFORMA Ref: 12/43404

Note: the prompts given below are only a guide to the information required for approval. Dependent on the type of equipment or system that requires approval delete any section that is not applicable or include additional information if necessary. Mandatory fields are marked with an asterisk (*).

1 Equipment or System to be approved *

Fuchs Lubritech Tram-Silence

2 Originator *

Name: Wayne Olsen/Nick Petticrew Company: ARTC

3 Introduction *

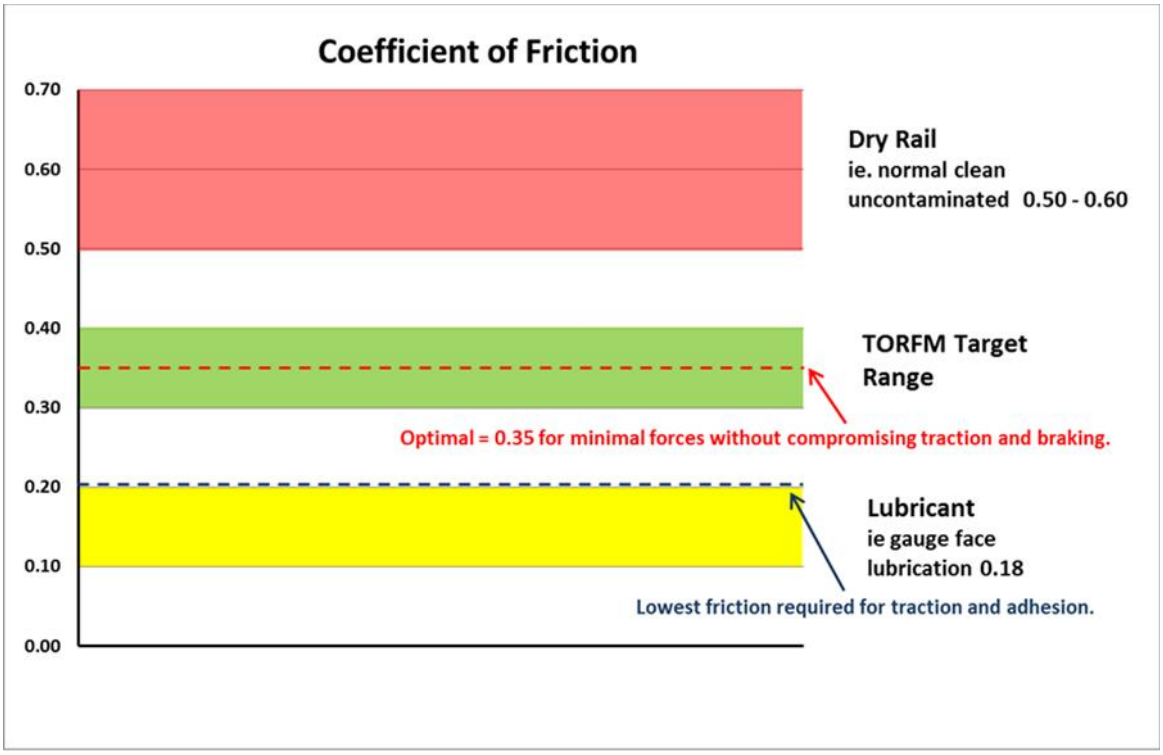
The issue of noise pollution, in particular high frequency wheel squeal, is a common issue for railways where trains travel through suburban populated areas.

One method for reducing the frequency of occurrence of wheel squeal is to apply a Friction Modifying agent to the top running surface of the rail. This Top of Rail Friction Modifier (TORFM) reduces the coefficient of friction, equalises it on both rails, and assists in eliminating the stick-slip effect known to be a cause of wheel squeal.

ARTC currently have a TORFM product from Kelsal approved network wide, which is predominantly used in the Hunter Valley.

Tram-Silence controls the friction rather than just reducing it. The pasty lubricant applied to the rail surface provides a fine film of solids.

Tram-Silence has been successfully trialled for a period of 6 months in the ARTC East West corridor in the Adelaide to Murray Bridge section.



4 Determination of Need *

ARTC E/W has been reporting to the Environmental Protection Agency (EPA) for many years regarding the noise conditions at Heathfield RailSQUAD, SA, and has been attempting to reduce overall noise levels.

Concerns have been raised that curfews may be enforced onto ARTC E/W on the Main South Line if a solution to noise issues is not found.

Other sections in ARTC also require more choices of TORFM to reduce noise from rail vehicles.

5	Significant Change or Not * This change in equipment or system is assessed as MINOR as FUCHS is a known supplier that has been in Australia for many years and their products are used by ARTC's former Alliance partner - Transfield Services. Kelsan TORFM has been approved by ARTC since August 2011 (Approval 08-08-11-118)
6	Review Panel * • John Furness - Manager Standards • Wayne Olsen – Project Manager East West • Jessica Tai – Track Engineer • Denis Snowden – WHS Co-ordinator • Nick Petticrew – Rail Performance Manager
7	Safety Train Operations issues The main issue, especially on track in steep grades, is the effect of the friction modifier on traction when at gradient. If too much of this product is applied to the rail, it may result in excessive wheel slip. Hence, regular monitoring to ensure that the coefficient of friction is within acceptable limits is essential. WHS issues This product may cause skin/eye irritation. Users of this product must have access to the relevant Safety Data Sheet. Safety Data Sheet and Specifications provided.
8	Performance and Suitability At any new sites, performance of the product must be monitored by the installing Project Managers and Track Inspectors for a period of at least 6 months, to monitor application amounts and ensure the product is not increasing the occurrence of wheel burns or the need for sanding. Tribometer friction measurements on the running surface of the rail must be used to determine the effectiveness and spread of TORFM. Rail SQUAD noise monitoring system (where available) or a calibrated noise meter should be used to assess the resulting effect on noise levels, especially during the first 6 months of installation. A test plan must be agreed upon by the originator and review panel prior to testing commences. There are no changes to the existing method of working, maintenance or environmental conditions hence safety of maintenance personnel will not change. See attached documents : • FUCHS – Tramsilence - Specification • FUCHS – Tramsilence – MSDS • FUCHS – Noise Reduction in Railway Traffic • RTSA – Top of Rail Friction Modification System for Wheel Squeal Mitigation (Dave Anderson/Bob Fogarty, Rail Corporation, NSW)
(i)	Use in other rail networks Tramsilence is currently used : • RailCorp, NSW. Type Approved. Contact Ian Battishall, Senior R&D Engineer, 0413 006 522. Currently have 36 units TORFM lubricators in operation. • Aurizon, Qld
(ii)	Use in the ARTC network Tram-Silence is now used in the Adelaide Hills. Also a similar product called "Kelsan" TORFM product has been used in ARTC Hunter Valley since 2011.
(iii)	Issues arising from usage of the equipment/system Traction issues at gradient due to excess application of friction modifier. This must be monitored during at least the first 6 month period as stated in section 8.

(iv) Changes required to infrastructure or systems for use of the equipment

Train / SAFE Notice to be issued to advise when a new system is to be installed anywhere on the ARTC Network.

No alteration to network configuration is involved from the use of the Tram-Silence product, hence no Network Alteration Notice (NAN) is required. If there is a new TORFM site established, a NAN is required and Ellipse must be updated with the required inspection requirements per EGP-03-02.

9 Reliability

Spread and effectiveness of the product on noise levels to be monitored by noise measurements (RailSQUAD where possible or calibrated noise meter) and Tribometer friction measurements.

10 Maintainability

Track Inspector responsible for maintaining TORFM units are to be trained in the handling of TORFM product and applicators.

11 Approval *

FUCHS Tram-Silence TORFM is approved for use across ARTC Network.

12 Conditions of Approval *

1. Installation and maintenance to be in accordance with manufacturer's instructions.
2. During the first 6 months the friction modifier is to be applied in small controlled amounts and monitored regularly – (weekly or every 50 trains, whichever is the lessor).
3. Friction coefficient is to be measured using a calibrated tribometer and assessed before modifying the controlled amount of Tram-Silence applied. Coefficient of friction to be within the range of 0.35 +/- 0.05
4. The coefficient of friction is to be tested using a tribometer on a regular basis in locations with potential grade/traction issues, not exceeding every 10 MGT.
5. Daily pre-work brief to be carried out prior to use and appropriate PPE utilised.
6. Must be used in conjunction with Lincoln Electronic Lubricator (type approval number 12/43426).
7. Noise reduction – Aiming to reduce noise levels by at least 30%, as measured as a % of axles that record noise in the categories of wheel squeal and flanging above 90 dB, or some similar basis)
8. If wheel noise is being induced from curving behaviour and TORFM is being reviewed for potential trials, the gauge face lubrication at the location should first be checked for adequate performance or the possible installation of a new unit reviewed. Gauge face lubrication can also have strong noise reduction benefits and it is desirable to exhaust all options of normal lubrication before TORFM is considered.

13	Does the Originator accept the additional Conditions of Approval as set by the Review Panel:	Yes	☒	No	☐	N/A	☐

14 Sign off — ARTC office use only

Review Panel:

John Furness	On File	Date:	16/07/2013
Wayne Olsen	On File	Date:	01/07/2013
Jessica Tai	On File	Date:	01/07/2013
Denis Snowden	On File	Date:	01/07/2013
Nick Petticrew	On File	Date:	01/07/2013