

TIPES Guide for Applicants Supplement

Thin Asphalt Surfacing Systems



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1. Introduction

The Transport Infrastructure Product Evaluation Scheme (TIPES) is administered by ARRB. Applications for registration of products under TIPES must be made via the application form provided in Attachment A. Applications are subject to the terms and conditions set out in the *TIPES Guide for Applicants and Terms and Conditions*. ARRB reserves the right to amend the terms and conditions from time to time as it sees fit.

Intending applicants should read the terms and conditions to familiarise themselves with the requirements and procedures before making an application.

FURTHER INFORMATION CAN BE OBTAINED FROM:

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2. Background to the supplement

TIPES is a national program endorsed by all Australian state and territory road agencies as well as the Queensland division of the Institute of Public Works Engineering Australasia and the Queensland Local Roads Alliance. The TIPES process delivers an independent technical assessment of road pavement construction and maintenance products that fall outside the scope of established standards and specifications. Products include innovative technologies, materials, equipment and/or processes. The foundation of the scheme is the validation of performance claims nominated in the application for TIPES assessment. The outcome of the evaluation is an autonomous expert technical opinion on the merit of new products, with the potential to reduce the need for separate assessment by multiple agencies.

The *TIPES Guide for Applicants and Terms and Conditions* (Guide) provides an overview of the general scheme, technical assessment process and documentation requirements, in addition to representative assessment durations and costs. A flowchart of the TIPES assessment process is provided in Figure 1.

This supplement to the Guide (Supplement) provides additional guidance specific to the assessment of thin asphalt layers for surfacing or resurfacing road pavements. Specifically, this Supplement is intended to:

- provide prospective applicants with greater detail on the assessment process
- document specific requirements of each assessment phase, above those established in the Guide
- define requisite considerations for product evaluation plan development to ensure consistency in the assessment of similar products
- outline (with increased accuracy) assessment durations and costs

- facilitate road agency consultation and approval of the assessment scheme, rather than seeking acceptance of individual product assessment plans.

The provisions, terms and conditions of the Guide take precedence over this Supplement, except where explicitly stated otherwise. The definitions of terms used in this document are as presented in the Guide or as defined herein.

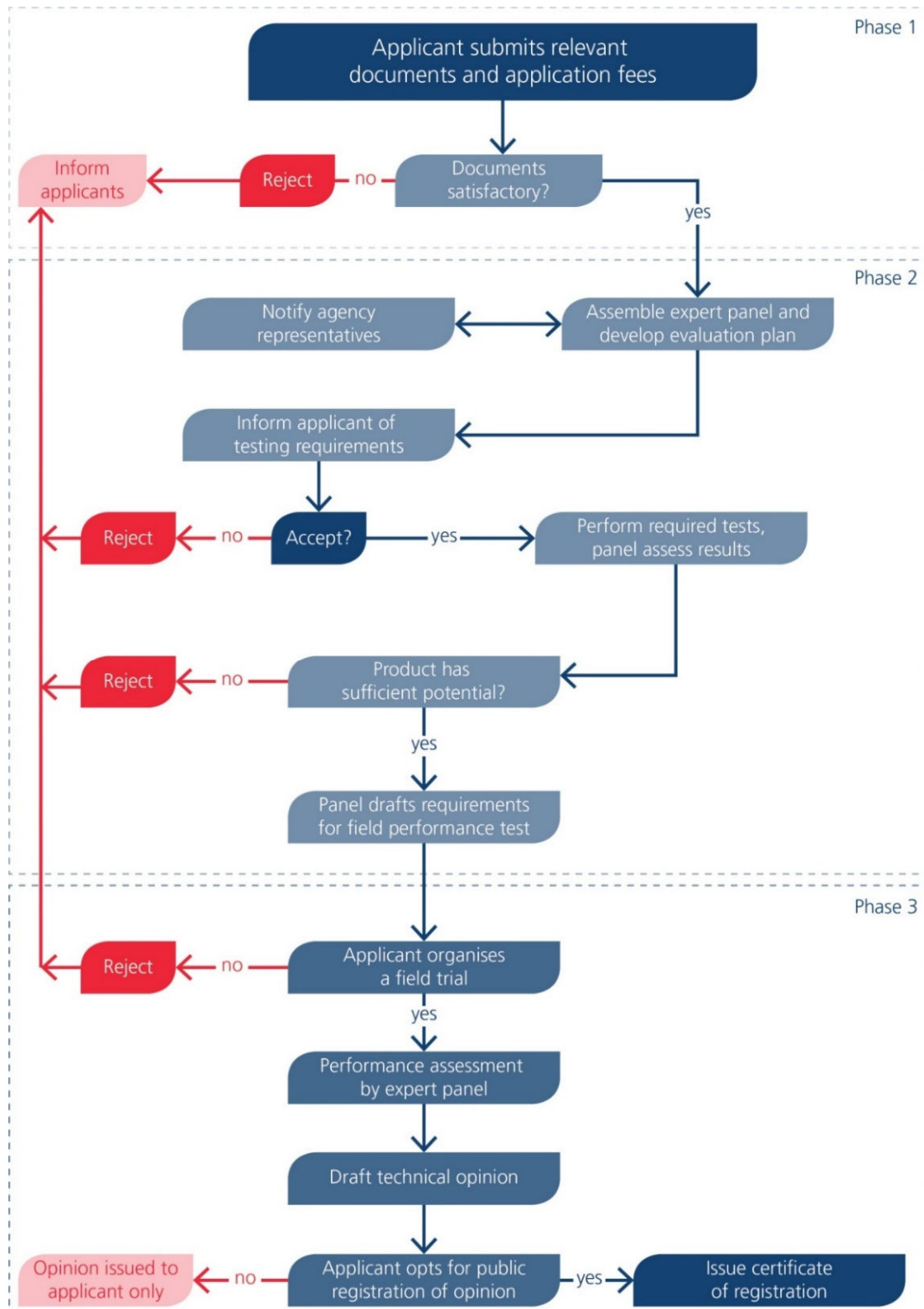


Figure 1: Flowchart of the TIPES process

3. Thin asphalt surfacing systems

Thin asphalt surfacings have a wide range of definitions across Australia and around the world. For the purposes of this Supplement, thin asphalt surfacings are defined by the following characteristics:

- a bituminous product
- laid to a depth of ≤ 40 mm
- intended mainly as a functional rather than structural road surface layer.

Possible benefits of thin asphalt surfacing, depending on the product, may include:

- reduced road surface noise
- reduced water spray from vehicles in wet weather
- superior skid resistance
- provision of an impermeable layer
- acting as a levelling course on a rutted pavement
- enhanced resistance to fuel spillage.

The guidance contained within this document is limited to thin asphalt surfacings, and does **not** assist in application of products including:

- sprayed seal treatments
- slurry surfacings (including micro-surfacings)
- dense-graded asphalt
- fine gap-graded asphalt (for low- and non-trafficked applications)
- double-layer surfacing systems.

Further guidance for applications involving products such as these can be obtained through consultation with ARRB Group.

There are a range of potential applications and benefits for using thin asphalt surfacings. Thin asphalt surfacings may present advantages over traditional dense-graded asphalt or sprayed seal surfacings, including:

- reduced treatment cost, owing to reduced layer thickness (and material quantities) and more efficient placement processes
- a high standard of surface texture with high-speed skid resistance
- reduced water spray and low tyre-pavement noise generation
- a smooth surface and good ride quality
- assisting with waterproofing of the underlying pavement (depending on specific requirements and pavement design)
- the ability to provide surface levelling of up to 20 mm in certain environments or conditions
- possible utilisation as a part of a long-life pavement concept, with periodic thin asphalt rehabilitation treatments over a fatigue-resistant base layer.

Thin asphalt surfacing products have several potential limitations, which may include:

- reduced shear resistance under certain configurations
- increased unit rate costs (\$ per tonne)
- the product possibly requiring preliminary regulation or interlayer treatments prior to placement
- products typically not contributing to the structural capacity of the pavement.

4. Review of application (Phase 1)

Review of the application will be conducted in accordance with Section 8 of the Guide. The focus of the Phase 1 assessment is examination of the completeness and adequacy of the submitted application.

The Phase 1 review begins upon receipt of both the application and the application fee. A completed *TIPES-Product Application Form* as presented in Attachment A, and sufficient documentation to address the 18 items of the *Supporting Information Checklist* presented in Attachment B of this Supplement constitute the application.

Application elements requiring particular emphasis include the product description, specific applications, design process, quality control/assurance system, utilisation practices and product management.

Applications must include manufacturer/supplier background information with specific emphasis to Items 1 through 4, Item 15 and Item 16 on the application checklist (Attachment B).

Item 1	Entered all details on application form (Attachment A)
Item 2	Details of intellectual property ownership
Item 3	If not the intellectual property owner, details of rights/entitlements
Item 4	Current Australian materials safety data sheet (SDS)
Item 15	Provided schedule listing all documentation in application
Item 16	Sent electronic copies of all supporting documentation.

The following sections provide further guidance on the subsequent items in the application checklist. These should be read in conjunction with the relevant sections of the *TIPES Guide for Applicants*.

Item 5: Product Description

The description must provide the Product Evaluation Panel with an understanding of the thin asphalt surfacing system. This summary should form a broad overview of the product composition and properties, and would typically include:

- a typical range of suitable applications

- the binder type and characteristics
- suitable aggregate properties
- related ancillary products critical to the system (e.g. tack coating, specialised paver)
- the mix design process (how is optimal material composition determined?)
- finished product properties.

Item 6: Intended Purpose and Use

The application must provide the Product Evaluation Panel with an understanding of the materials, traffic conditions and environments where the product is optimally employed. It should also identify specific situations where the product should not be used.

The application should provide a clear intended purpose for the product, which would assist road agencies in selecting the use of the product for maintenance, rehabilitation and functional surfacing treatments.

Item 7: Transportation, Use and Maintenance

The application should document the processes and quality management systems in place for manufacturing and placement, with consideration of the following:

- preparation of the existing surface or substrate
- treatment options where pavement repair or levelling is required before installing the system
- survey requirements
- storage and handling of materials
- on-site quality control procedures
- manufacturing and on-site audit processes
- placement procedures and timing
- equipment and personnel required for manufacturing, placement and quality control
- placement conditions and limitations (weather, trafficking, etc.)
- post-completion procedures including guidance on trafficability
- options/strategies for future maintenance and repair.

TIPES certification is subject to ongoing monitoring and reassessment under certain circumstances, as detailed in Section 15 of the *TIPES Guide for Applicants*. This is especially important when considering the ongoing adherence to quality management systems, internal procedures and placement practices.

Item 8: Specific Applications and Benefits

Specific applications of the product and claimed benefits brought about through treatment are a critical component of the TIPES process, and it is necessary to clearly define the benefit claims in order to facilitate the development of a suitable assessment program in Phases 2 and 3 of the process.

Materials

Material properties may significantly impact on overall performance. It is therefore necessary to provide a typical range of materials for which the product is suitable. This may include any documented suitability of recycled materials and any minimum specifications for aggregate.

Pavement configuration

The application should nominate the range of underlying and existing pavements where treatments would be considered suitable, and should include some example pavement configurations. Where the product can be used to resurface existing roads, the applicant must state the minimum requirements on the underlying pavement/surface conditions that the product can be placed and provide satisfactory long-term performance. This may include requirements for cracking, surface evenness and/or deflection under load.

Technical benefits

The stated technical benefits are the primary basis by which the product will be assessed by the Product Evaluation Panel in Phases 2 and 3 of the TIPES process. These should constitute measurable improvements to the pavement structure and/or functional performance of the pavement as a result of adopting the thin asphalt surfacing system as opposed to an alternative (such as dense-graded asphalt or a spray-sealed surface, depending on the application).

Any claimed technical benefit must be able to be validated through recognised testing methods and procedures, so due consideration should be given to the potential to validate any claimed technical benefit. Further documentation of the testing methodology can be found in Section 5 and Section 6 of this Supplement.

Item 9: Details on Suitable Traffic and Environmental Conditions

Traffic

The applicant is required to nominate in the application the maximum traffic category from Table 1 for which the product is deemed suitable. Traffic categories are defined according to the number of heavy vehicles per lane per day, and whether or not it is appropriate for use in high-severity situations. High-severity situations are sections with one or more of the following characteristics:

- signalised intersections
- sharp curves (radius \leq 100 metres)
- steep grades of greater than 6%
- roundabouts or areas with a high proportion of turning movements.

High-severity areas are designated as certification levels A1, A2, A3 or A4 (depending on traffic volume); while areas with normal demand are designated as certification levels B1, B2, B3 or B4 (again, depending on traffic volume).

Products certified for use in high-severity locations are also taken to be certified for use in all other areas; however, a product certified for normal applications is **not** certified for use in high-severity locations.

The eight defined categories of certification under this Guide are detailed in Table 1. Applicants are required to specify for which category they seek certification. The field performance trial will take place on a section with characteristics matching the highest level for which certification is sought. Products certified under Categories 1, 2 and 3 are also certified for lower traffic levels, subject to also being certified under the necessary application category.

Traffic volume is defined as heavy vehicles per lane per day, so heavy vehicle counts will have to be adjusted based on the number of lanes over which the volume of heavy vehicles was calculated. All heavy vehicles (Austroads Classes 3–12) are treated equally for the purposes of this calculation.

Table 1: Certificate classifications

Certification level	Traffic volume (average number of heavy vehicles per lane per day)	Site severity
A1	10 – 50	High-severity
B1		Normal
A2	51 – 250	High-severity
B2		Normal
A3	251 – 1000	High-severity
B3		Normal
A4	> 1000	High-severity
B4		Normal

Environment

Significant variations or extremes in temperature, humidity and moisture conditions can impact the performance of asphaltic materials. If applicable, the suitable climatic ranges required for effective application, placement and performance of the product should be designated along with specific environmental conditions under which the product will not be effective or performance may be diminished.

Items 10–12: Original Test Results and Data on Past Performance

The application should include any original laboratory test results from previous applications and trials of the product, whether in Australia or overseas.

The application should also include copies of any performance data from past use of the product, whether in Australia or overseas. This may include measured skid resistance after placement and after a period of use, and performance data on functional properties such as road noise and water spray.

The application should ensure that any supporting documentation includes a signed statement by the original authors of the test results and/or performance data. The applicant should also submit a list of all known previously constructed road sections using the product across Australia. This list should include (where possible):

- location of sections
- known or estimated traffic (average number of heavy vehicles per lane per day) on the section
- any testing results, immediately post-placement and at intervals after placement
- any history of repairs and/or failures.

Item 13: Design and Placement Process

The design process includes a number of key steps which should be documented to allow the Product Evaluation Panel to assess a standard, repeatable process for the design and placement of the surfacing as part of the application. This process may vary considerably by product, but would generally involve at least the following:

- document typical material and binder selection process and testing
- outline the mix design process
- examples using any design software
- a schedule/timeline of placement processes
- quality assurance processes during design, manufacture and placement (including corrective actions to be undertaken to address nonconformities with their processes and/or product requirements)
- post-placement testing of the pavement
- method of predicting the service life of the treatment.

Item 17: Product Evaluation Panel

The Product Evaluation Panel will be comprised of persons having expert technical training, experience and knowledge in the relevant fields as determined by ARRB.

As a guide, the Product Evaluation Panel will typically include one representative of:

- potential users of the product (road agencies)
- the product industry (independent trade association)
- experts in the field of practice (ARRB or other scholars).

As outlined in the Guide, an independent subject matter expert may be nominated in the application to serve on the Product Evaluation Panel, subject to review by ARRB. The applicant will be notified of the composition of the Product Evaluation Panel prior to initiation of the Phase 2 assessment.

Item 18: Quality Systems

Evidence should be provided that a quality system is in place, which covers the design, manufacture, storage, transport and placement of the product. Where certification of compliance with an established quality standard, such as ISO 9001, is not available,

documentation of the procedure and two to three examples of utilisation of the quality system should be provided with the application. Where applicable, the approved manufacturer(s) and/or approved contractor(s) should be identified to ensure compliance with the quality system.

5. Initial assessment (Phase 2)

The initial assessment will be conducted in accordance with Section 9 of the Guide. Determination of the technical merit of the product, based upon information supplied with the application, is the focus of the Phase 2 assessment. The Phase 2 assessment begins upon receipt of the initial assessment fee, as outlined in Attachment B of the Guide. The Product Evaluation Panel will review and evaluate the application. Products are assessed relative to the specific applications and benefits presented in the application. The technical opinion and registration will focus on the validation of these claims.

Application elements receiving particular scrutiny include laboratory testing results from a registered testing authority and historical performance data supporting the application and benefit claims. The Product Evaluation Panel will provide a written opinion, based on the supplied information, as to whether the product has sufficient potential to be considered for inclusion in a field performance trial.

This section identifies some ‘typical’ performance properties to be assessed for thin asphalt surfacing systems. The performance properties and test methods listed in this document are intended as a guide for potential applicants and Product Evaluation Panel members. The evaluation plan will differ depending on the nature of the product and the specific applications and benefits nominated in the application. The specific testing and reporting requirements will be selected and documented by the Product Evaluation Panel in the initial assessment evaluation plan.

Evaluation Plan

An initial assessment evaluation plan will be developed by the Product Evaluation Panel in consideration of the specific applications and benefits of the product, as put forward by the applicant in the application documents. The objective of the evaluation plan is to validate the claims made with respect to the technical performance of the product and to establish whether the product has sufficient technical merit to warrant further assessment in a field performance trial.

The initial assessment evaluation plan will outline the applicable design parameters, standard testing methods and performance criteria. In finalising the evaluation plan, the Product Evaluation Panel will solicit comments from both the nominated contact person for the product and TIPES participating road agencies.

In the case of thin surfacing systems, the evaluation plan will comprise both laboratory assessment of the product as well as field inspection and testing of existing road sections (if applicable).

This section presents standard test methods to be used in the assessment of products, where claimed benefits include engineering property improvement. Standard testing methods, and associated sample preparation techniques, testing conditions and number of replicates, selected for the initial assessment should allow for quantification of the specific applications and benefits of the product. The Product Evaluation Panel will refine the testing protocol in consideration of the typical applications and claimed benefits of the product.

Visual Assessment of Existing Sections

Many new products have significant lengths of existing sections at various ages across the network. The Phase 2 assessment should include, where possible, visual assessments (including texture depth testing) of several such sections, with the number of sites, the extent of the visual survey and the personnel to carry out the survey to be determined by the Product Evaluation Panel.

When assessing existing sections, the inspection team should take into account the age, underlying pavement conditions, traffic loading and any other external factors.

Material Selection and Evaluation

Materials selected for the Phase 2 initial assessment of the product should be representative of the typical range of materials suitable for use, as indicated under Item 8 of the application checklist.

Consideration should be given to selecting materials that have previously been utilised on existing projects, particularly where there is a history of documented in-service performance with that material type. The Product Evaluation Panel will consult with the applicant when determining material selection.

Mandatory Tests

Materials selected for inclusion in the initial assessment should be characterised in accordance with the methods listed in Table 2. This process will seek to ensure that the system and its components to be assessed are being manufactured and produced in line with the stated manufacturing specifications.

The following section outlines the mandatory test parameters which may be included in the Phase 2 testing protocol for any thin asphalt surfacing system.

Aggregate polishing resistance

Thin asphalt layers rely on materials with high resistance to aggregate polishing in order to provide adequate skid resistance over the service life of the treatment. Applicants should nominate minimum values for polishing resistance, ensuring that these values comply with the relevant road agency minimum requirements.

Aggregate strength and durability

Pavement surfacing layers must resist high stresses, and aggregates with low strength and/or poor durability may be vulnerable to crushing of aggregate, which can lead to ravelling, moisture ingress and surface irregularities.

Applicants should nominate minimum values for aggregate strength and durability, ensuring that these values comply with the relevant road agency minimum requirements.

Resistance to abrasion and moisture damage

Materials and systems that are susceptible to moisture-induced damage may see reduced performance and loss of aggregate when exposed to moisture and traffic for prolonged periods.

Testing to evaluate resistance to stripping should be carried out in line with TMR test method Q325, under test conditions determined by the Product Evaluation Panel in conjunction with the applicant using the Hamburg wheel tracking device, or an alternative test(s), as agreed by the Product Evaluation Panel and the applicant.

Resistance to permanent deformation

Testing of resistance to permanent deformation of the surface layer is only required in cases where the thin asphalt surfacing system is placed at a thickness of ≥ 20 mm.

Testing to evaluate resistance to permanent deformation should be carried out in line with Austroads test method AGPT/T231.

Torque bond strength

Thin asphalt surfacing systems rely on a strong bond between the thin asphalt layer and the underlying pavement (typically an existing asphalt layer). Particularly in cases where the underlying pavement may be aged, there can be failures of this bond and this can lead to poor overall performance of the system.

The torque bond strength can be tested through the torque bond test, which was developed specifically for testing of thin asphalt surfacing systems as a part of the British HAPAS and South African Agrément scheme.

Table 2: Mandatory laboratory testing for thin asphalt surfacing systems

	Properties	Standard	Test method	Performance levels ¹
Laboratory	Combined particle size distribution	AS/NZS 2891.3.1	Particle size distribution	Conforms to manufacturer's specifications
	Binder content	AS/NZS 2891.3.1 or AG:PT/T234	Binder content (by mass)	Conforms to manufacturer's specifications
	Aggregate polishing resistance			Conforms to manufacturer's specifications and relevant jurisdictional requirements
	Aggregate strength and durability			Conforms to manufacturer's specifications and relevant jurisdictional requirements

	Properties	Standard	Test method	Performance levels ¹
Laboratory	Resistance to abrasion and moisture damage	Q325 or agreed alternative test	Hamburg wheel tracking device	Report – shall not strip or ravel as defined by test method
	Deformation resistance (only for products laid at a thickness ≥ 20 mm)	AG:PT/T231	Deformation resistance of asphalt by the wheel tracking test	Level 1: ≤ 8.0 mm after 10,000 passes at 60 °C Level 2: ≤ 4.0 mm after 10,000 passes at 60 °C Level 3: ≤ 2.0 mm after 10,000 passes at 60 °C Level 4: ≤ 1.0 mm after 10,000 passes at 60 °C
	Torque bond strength	Torque bond test	Torque bond test ²	≥ 400 kPa
Field assessment	Refer to Attachment C for details			

¹ Road agency to specify minimum requirements for projects.

² Test method available in the *HAPAS Interim Guideline Document for the Assessment and Certification of Thin Surfacing Systems for Highways* as Appendix A3.

Optional Tests

In addition, there are several optional test methods that may be adopted during the Phase 2 assessment of thin asphalt surfacing systems in order to validate additional claimed engineering performance benefits (Table 3). The Product Evaluation Panel may deem one or more of these tests as being critical to the assessment of a particular product.

Resistance to fatigue

Asphaltic pavements can exhibit fatigue induced failure due to loading, environmental conditions, or a combination of these factors. As with the test for permanent deformation, this testing is particularly relevant in cases where the thin asphalt surfacing system is installed over an existing pavement with moderate to high deflections. This may include pavements with unbound granular base layers, or where there is only a thin existing asphalt surfacing. Testing should be carried out in line with the method contained within the Austroads test method AGPT/T274.

Resistance to moisture ingress

Testing of the resistance to moisture ingress of the surfacing layer is particularly relevant in cases where the thin asphalt surfacing system is installed over a moisture sensitive and/or porous pavement. This may include pavements with unbound granular base layers. Testing

should be carried out in line with one of the standard methods for testing the permeability of asphalt using the ponding method.

Table 3: Optional laboratory testing for thin asphalt surfacing systems

Properties	Standard	Test method	Performance levels ¹
Resistance to fatigue and flexural stiffness	AG:PT/T274	Characterisation of flexural stiffness and fatigue performance of bituminous mixes (at 20 °C)	Report <i>Future performance levels to be determined</i>
Resistance to moisture ingress	Q304A, or agreed alternative test	Permeability of asphalt – ponding method	≤ 15 µm/s

¹ Road agency to specify minimum requirements for projects.

Submission of Results

The supporting information submitted with the application will constitute the basis of the initial assessment. All laboratory and field testing results must be obtained through a registered testing authority before they will be considered as evidence of past performance by the Product Evaluation Panel. Utilisation of equivalent standard test methods from alternative authorities will be considered at the discretion of the Product Evaluation Panel.

Where data supplied with the application does not sufficiently address the requirements of the evaluation plan, the Product Evaluation Panel will notify the nominated contact person for the product of additional data requirements (laboratory or otherwise) and options for attainment. Supplementary data should be submitted directly to the Product Evaluation Panel.

All information submitted to the Product Evaluation Panel is treated as commercial-in-confidence. Any proprietary information or processes should be indicated in the application to ensure correct handling of sensitive information.

Initial Assessment Opinion

The Product Evaluation Panel will prepare written advice on whether to recommend the product for a field performance trial. The initial assessment opinion of the product will include a description of the requirements for the field performance trial, where applicable. Where the Product Evaluation Panel considers a product to have a strong historical track record of performance as well as promising laboratory results, provisional registration may be granted.

Provisional registration is only considered when requested in the application and where a significant history of past performance (preferably in Australia) is available. At the completion of the field trial, products with interim registration will be issued a 'technical opinion' as for any other product, with a favourable opinion moving the product to the permanent Register and an unfavourable opinion leading to the removal of the interim certification.

6. Field performance trial (Phase 3)

The field performance trial will be conducted in accordance with Section 10 of the Guide. Evaluation and monitoring of the in-service performance of the product is the focus of the Phase 3 assessment. The Phase 3 assessment begins upon receipt of the field performance trial assessment fee, as outlined in Attachment B of the Guide. The Product Evaluation Panel will observe the design, placement and short-term (\approx 24 months) performance of the product.

Trial elements of particular interest include placement of the product and periodic condition monitoring. The Product Evaluation Panel will provide a draft technical opinion, in consideration of Phases 1, 2 and 3 of the assessment, on the validity of the benefits and specific applications nominated for the product.

Where documentation of previous trials or overseas certification for the product are available, the Product Evaluation Panel will review the documentation and adjust the requirements of the field performance trial, as applicable.

Evaluation Plan

The scope of the field performance trial includes evaluation of the system design, manufacturing processes, construction and quality control/assurance practices, in addition to performance under traffic.

A field performance trial evaluation plan will be developed by the Product Evaluation Panel reflecting the intended purpose and use of the system, system configuration, traffic and environment conditions, as identified in the application. The objective of the evaluation plan is to ascertain whether the product will provide satisfactory service under traffic, relative to the conditions of the trial.

The field performance trial evaluation plan will outline the requirements for the trial site, design and construction practices, and performance monitoring, in addition to the field performance trial assessment fee. An indicative value is provided in Attachment B of the Guide, but the actual field performance trial assessment fee is product-specific and will depend on the particulars of the trial. In finalising the evaluation plan, the Product Evaluation Panel will solicit comments from both the nominated contact person for the product and TIPES participating road agencies.

Site Selection

The field performance trial should be conducted at a site where the conditions are representative of the specific applications of the product, as nominated in the application. Operational conditions influencing the suitability of the trial site include the existing pavement configuration, traffic and environment.

The location of the trial site, in addition to the construction and maintenance program, must be negotiated between the nominated contact person for the product and a TIPES participating road agency. The Product Evaluation Panel must confirm the suitability of the proposed site prior to commencement of the trial.

Pavement configuration

A section with an appropriate existing pavement configuration and composition should be selected in consideration of the specific applications nominated for the product.

Traffic

The site selection should consider the predominant traffic type and suitability of the product. The anticipated traffic volume throughout the design life of the product, in addition to maintenance and rehabilitation alternatives, should also be considered. The site selection should consider both posted and typical travel speed.

The applicant is required to nominate the certification level for which TIPES accreditation is sought. The traffic conditions at the field trial should be representative of the nominated application category and traffic volume, at the discretion of the Product Evaluation Panel.

Environment

Environmental conditions can impact on the performance of asphalt pavements and surfacings. Selection of the trial site should be conducted in consideration of the likely moisture conditions, seasonal moisture variations, and extreme seasonal temperature variations.

Design and Construction

Design and construction of the field performance trial should be conducted in accordance with the procedures outlined in the application. Any modification of the design and construction procedures must be negotiated by the Product Evaluation Panel, the sponsoring road agency and the nominated contact person for the product.

The Product Evaluation Panel may wish to specify a control section, constructed with a conventional pavement configuration (e.g. dense graded asphalt). Quality assurance data collected during placement should be submitted to the Product Evaluation Panel for review.

Mandatory Laboratory Tests

Phase 2 assessment testing (refer to Tables 2 and 3 where applicable) is typically completed on any mix incorporated into field performance trials.

Performance Monitoring

The Product Evaluation Panel will monitor the field performance trial throughout the agreed duration, typically long enough to understand relative field performance parameters.

Mandatory Field Tests

The monitoring activities will vary in accordance with the nature of the product and the particulars of the trial site.

Table 4 presents a list of the mandatory tests to form the basis of any Phase 3 assessment.

Skid resistance

A functional parameter that is critical to the performance of any thin asphalt surfacing system is the skid resistance of the pavement surface, as tested under wet conditions.

The traditional device used to measure the skid resistance of road surfacings on the east coast of Australia is the Sideway-force Coefficient Routine Investigation Machine (SCRIM).

Testing of the surfacing should be completed using this device (immediately after placement, and after approximately two years of trafficking), or other device, as agreed by the Product Evaluation Panel and the applicant.

Texture depth

Texture depth of the surface layer is a critical factor in determining the skid resistance of the pavement, as well as various functional properties such as noise reduction and water spray reduction.

Texture depth should be measured in the inner wheel path (IWP), between the wheel path (BWP), and the outer wheel path (OWP) at 20 metre intervals for normal-demand applications and 10 metre intervals for high-severity applications immediately after placement and after 24 months of trafficking, using test method AGPT/T250, unless otherwise agreed by the Product Evaluation Panel and the applicant.

Three performance levels are defined in relation to texture depth, with minimum requirements listed for immediately after placement and after two years of trafficking. This is largely dependent on the speed environment and the appropriate performance level for a product is to be discussed between the Product Evaluation Panel and the applicant.

More regular intervals may be necessary for systems with a limited performance history in Australia or overseas.

Visual condition monitoring

Visual condition monitoring occurs at regular intervals, including immediately after placement, after 1 year of trafficking and after 2 years of trafficking, or at intervals as determined by the Product Evaluation Panel in conjunction with the applicant.

The process by which visual assessments should be undertaken is contained within Attachment C of this Supplement.

Table 4: Mandatory field testing for thin asphalt surfacing systems

Properties	Standard	Test method	Performance levels ¹
Skid resistance	VicRoads test method RC421.02 or agreed alternative	Skid resistance of a road pavement using SCRIM	Report

Texture depth	AG:PT/T250	Modified surface texture depth (Pestle method)	Level 3: ≥ 1.2 mm immediately after placement ≥ 0.9 mm after 2 years of trafficking Level 2: ≥ 0.7 mm immediately after placement ≥ 0.6 mm after 2 years of trafficking Level 1: ≥ 0.5 mm immediately after placement ≥ 0.4 mm after 2 years of trafficking
Visual condition assessment	Refer to Attachment C		

¹ Road agency to specify minimum requirements for projects.

Optional Field Tests

In addition to the mandatory tests listed in Table 4, there are several optional parameters that may be assessed during Phase 3 in order to validate additional claimed engineering performance benefits. The Product Evaluation Panel may deem one or more of these tests as being critical to the assessment of a particular product.

Noise reduction

Noise generated from the contact between tyres and the pavement can be an important consideration, particular in urban areas. Studies have shown that some thin asphalt surfacing systems can significantly reduce noise generation. A number of tests have been used to assess this previously, including those listed in Table 5. Regardless of the method chosen, performance will largely be assessed as a reduction against a comparable control section of pavement.

Table 5: Optional field testing for thin asphalt surfacing systems

Properties	Standard ¹	Test method	Performance levels
Noise	ISO 11819-1	Statistical pass-by	Comparative assessment
	ISO/DIS 11819-2	Close proximity method	
	AASHTO TP 76-10	On-board sound intensity method	

¹ Road agency to specify minimum requirements for projects.

7. Technical opinion

Drafting, review and publication of the technical opinion will be conducted in accordance with Section 11 of the Guide. When the field performance trial is completed, the Product Evaluation Panel will produce a draft technical opinion on the validity of the benefits and specific applications nominated for the product.

The technical opinion will include:

- contact information for the nominated contact person for the product and the manufacturer or originator of the product, as applicable
- product summary including description, characteristics, details or specifications for use, handling, storage and utilisation precautions, benefits, in addition to intellectual and/or licensing rights, as applicable
- objective technical evaluation based on laboratory and field measurements and/or tests relating to the performance of the product
- statement of measurable benefits, construction and maintenance activities.

Where a favourable outcome is achieved, the technical opinion is listed on the TIPES Register and a certificate of registration is issued for the product. While the application form and supporting information are only reviewed by ARRB and the Product Evaluation Panel, the technical opinion is considered public information.

The nominated contact person may select not to have the technical opinion published (regardless of outcome). However, online registration is only available for products with published technical opinions. The technical opinion will be prepared in a format determined by ARRB and all evidence must be referenced.

Assessment Criteria

At the conclusion of the field performance trial, the Product Evaluation Panel will endorse/highlight the measurable benefits of the product based on the outcomes of the Phase 1, 2 and 3 assessments and in consideration of the specific applications and benefits nominated in the application. Assessment criteria receiving particular scrutiny include:

- the completeness and adequacy of technical documentation
- verification of the degree of engineering property improvement
- confirmation of satisfactory in-service performance.

Certificate of Registration

Where the technical opinion is favourable to the product, following receipt of the signed technical opinion from the nominated contact person, ARRB will approve the issue of a certificate of registration. The certificate of registration authorises the publication and distribution of the technical opinion by the nominated contact person.

Where the technical opinion is not favourable to the product, ARRB will not approve a certificate of registration, and distribution of the technical opinion will be restricted to the nominated contact person, persons within ARRB and the Product Evaluation Panel.

Product registration is permanent except where the provisions of Section 15 of the Guide are applicable.

8. Schedule and budget

The cost and duration of the TIPES assessment process for thin asphalt surfacing systems will vary according to the nature of the product and the requirements for Phase 2 and 3 assessments. The anticipated duration and administrative costs for TIPES assessment are presented in Table 6.

Table 6: Schedule of indicative fees for TIPES assessment

Phase	Assessment step	Duration (months)	Fee schedule (AUD)
Phase 1	Review of application	1	\$3,600
Phase 2	Initial assessment	6	\$10,500
	Visual condition assessment of existing sites		\$4,000 ¹
Phase 3	Field performance trial	24 ¹	\$7,000 ¹
	Technical opinion, registration and publication	2	To be determined
	Total	33 ¹	To be determined

¹ Indicative values provided for general reference only. Actual duration and fees will vary depending on the exact requirements of each product assessment.

The assessment duration and costs presented in Table 6 are subject to variation, and Attachment B of the Guide should be examined for the current figures. The initial assessment fee presented in Table 6 includes general administration, development of the initial assessment evaluation plan, and the Product Evaluation Panel review. The costs associated with generation of the supporting information, including laboratory testing results from a registered testing authority, are not included in the initial assessment fee. However, potential applicants are encouraged to contact a registered testing authority to obtain a more accurate estimate of laboratory testing costs.

The field performance trial fee includes general administration and development of the field performance trial evaluation plan, in addition to Product Evaluation Panel oversight and review. The field performance trial fee presented in Table 6 does not include the design, construction, maintenance and rehabilitation costs, nor the costs associated with surface and condition monitoring. The actual costs for the field performance trial will vary according to the nature of the product and the particulars of the trial site.

Attachment A – Application form

Thin Asphalt Surfacing Systems

(replaces Attachment A of the *TIPES Guide for Applicants and Terms and Conditions*)

Product name:		
Applicant's legal entity name:		
Applicant's ACN/ABN:		
Business address:		
Contact person:		
	Phone:	Fax:
	Email:	
Manufacturer's name:		
	Address:	
	Phone:	Fax:
	Email:	
Certificate classification level:	<input type="checkbox"/> A1 <input type="checkbox"/> A2 <input type="checkbox"/> A3 <input type="checkbox"/> A4	<input type="checkbox"/> B1 <input type="checkbox"/> B2 <input type="checkbox"/> B3 <input type="checkbox"/> B4
Quality system (certification, details, manufacturer/contractor(s), etc.)		

Attachment B – Supporting information checklist

For more information on each Item in this checklist, please see the extended notes for thin asphalt surfacing system applications in Section 3 of this Supplement.

1	Entered all details on application form	
2	Details of intellectual property ownership	
3	If not intellectual property owner, details of rights/entitlements	
4	Current valid Australian materials safety data sheet (SDS)	
5	Provided full description of the product (composition, properties and tolerances, process details)	
6	Outlined the intended purpose and use for the product	
7	Details of use and suggested instructions for transportation, placement and maintenance	
8	Specific applications and benefits of the product to be evaluated	
9	Details on range of traffic and environmental conditions for which the product is deemed suitable	
10	Attached copies of all original test results	
11	Attached copies of original data on past performance of product	
12	Original signed statement by authors of supporting documentation	
13	Provided description of design process to enable product assessment	
15	Provided schedule listing all documentation in application	
16	Sent electronic copies of all supporting documentation	
17	Provided suggested experts to be considered for Evaluation Panel	
18	Level of quality assurance in place and evidence provided	

Basis for Assessment

This Attachment to the TIPES Supplement for the assessment of thin asphalt surfacing systems provides a basis for the visual assessment of existing project sites and trial sites under Phase 3 of the TIPES assessment.

The protocol described in this section has been developed with reference to Appendix A of the Austroads *Guide to Pavement Technology Part 5: Pavement Evaluation and Treatment Design*, as well as to Appendix A.10: *Visual Assessment of Trial Sites* within the British Board of Agrément (BBA) Highway Authorities Product Approval Scheme (HAPAS) *Guideline Document for the Assessment and Certification of Thin Surfacing Systems for Highways*.

This protocol has been developed specifically for the visual assessment of thin asphalt surfacing systems under TIPES, and may not be appropriate for the visual assessment of other road surfacing types and/or products, nor is it necessarily appropriate for the assessment of surfacings outside of the typical TIPES Phase 3 assessment period (approximately two years post-placement).

Definitions

In addition to the general definitions as set out in the *TIPES Guide for Applicants and Terms & Conditions*, the following definitions apply:

A **site** is defined as a length of road open to regular traffic on which one or more surfacing products has been laid to assess in-service performance.

A **section** is defined as a designated length of a site on which a specific surfacing has been laid. A site may comprise multiple sections, with the same or different products and/or layer compositions.

Responsibilities and Personnel

The Product Evaluation Panel is responsible for arranging all details of any inspections (existing sections and Phase 3 trial sites).

Inspection dates are to be set in consultation with the prospective inspection panel members and the applicant, and should be set as close as possible to the dates as required under the assessment plan.

The evaluation method is to be as set out in Attachment D, although the Product Evaluation Panel are able to make any amendments to the evaluation protocol and marking guide to account for factors specific to the product(s) being assessed.

Any changes to the standard evaluation protocol and marking guide are to be communicated to the applicant with reference to the reasons for these amendments.

The applicant is responsible for providing access to the site(s), which includes arranging for any necessary road closures, traffic control and other safety precautions.

All laboratory testing costs associated with the field assessment are to be borne by the applicant. Indicative costs are noted in Table 6, although the exact figures depend on a number of factors, including the number and length of sites, the level of access, and the claims with respect to the product itself.

Inspection

The inspection panel should consist of one or more suitably qualified persons, who as recognised expert(s) in road surfacings, should have sufficient experience in assessing various road surfacing products.

Each member of the inspection team is issued a copy of the *Inspection Panel Report Form* (see Attachment D). This form includes reference to the following important information:

- inspection panel member names and positions
- date of inspection
- details of the product(s) being assessed
- the nature of the inspection (existing sections or TIPES Phase 3 assessment) and the time since placement of the product
- details of the sections to be inspected
- the prevailing weather and road conditions throughout the inspection.

The form includes space for the assessment of up to four sections at each site, although additional sections may be added to the assessment if required. The pavement conditions at each site should be inspected as closely as possible and should include viewing the section from multiple angles.

Evaluation

Sections are to be assessed based on the current serviceability, regardless of the age of the pavement and the type of inspection being carried out. During assessments of existing sections during TIPES Phase 2, inspectors are not required to assign a mark to the overall pavement condition with respect to determining pass/fail criteria, however they may do so for comparative purposes

Damage to the pavement that appears to have been caused by chemical actions (e.g. fuel spill), vehicle impact, or other mechanical actions can be noted during the inspections, but should not adversely affect the mark given when assessing a section of pavement.

Any faults identified during the inspection of each section are to be noted in the appropriate space on the Inspection Panel Report Form. The relevant suffixes for the purposes of notation are listed in Table D1. This listing of potential bituminous surfacing faults has been compiled from Austroads *Guide to Pavement Technology Part 5: Pavement Evaluation and Treatment Design*.

Following the assessment of each section, a mark is to be assigned to each section based on the assessment mark summary in Table D2. When determining the assessment mark, it is important to consider the severity and extent of faults.

The final determination of marks from the panel of inspectors is to form part of the results under TIPES Phase 3, although individual assessor marks for each section are not required to be included in the results.

Reporting

Each assessment is to be documented in the format of an inspection report. This report will include:

- details of the inspection (location, date, time, weather, panel members)
- section details with identifiable location markers
- a summary of all faults, compiled from all inspection report forms
- any additional comments regarding the section that may be relevant.

This report is to form part of the TIPES technical opinion for the product.

References

Austrroads 2011, Guide to Pavement Technology Part 5: *Pavement Evaluation and Treatment Design*, AGPT05-11, Austrroads, Sydney.

British Board of Agrément (BBA) 2013, Highway Authorities Product Approval Scheme (HAPAS) Guideline Document for the Assessment and Certification of Thin Surfacing Systems for Highways, Appendix A.10: *Visual Assessment of Trial Sites*.

Transport and Main Roads 2012, *Guide to the Visual Assessments of Pavements*, Version 1.0, June 2012.

Attachment D – Inspection panel report form

Product name:			
Applicant:			
Site:			
Panel member name:			
Date of inspection:		Inspection:	<input type="checkbox"/> Post-placement <input type="checkbox"/> After one year of service <input type="checkbox"/> After two years of service <input type="checkbox"/> Existing section assessment <i>Age of section:</i>
Number of sections to assess:			
Weather and road conditions:			
Assessment of sections			
Section/chainage	Notation of faults (see Table D1)		Mark (Table D2)
1.			
2.			
3.			
4.			

Note: Add more sections as required

Table D1: Notation of faults (adapted from AGPT05)

Suffix	Modes of pavement distress ¹
DR	Deformation – rutting
DS	Deformation – shoving (plastic flow)
DD	<i>Depression and heave²</i>
DC	Deformation – corrugation
CB	<i>Cracking – block cracking²</i>
CR	Cracking – crocodile cracking
CT	<i>Cracking – transverse cracking²</i>
CD	<i>Cracking – diagonal cracking²</i>
CM	<i>Cracking – meandering cracking²</i>
CC	Cracking – crescent shaped cracking ²
CL	<i>Cracking – longitudinal cracking²</i>
EB	<i>Edge break²</i>
ED	<i>Edge drop-off²</i>
SD	Delamination
SS	Stripping (asphalt)
SR	Ravelling
SF	Flushing
SP	Polishing ³
HO	<i>Potholing²</i>
PA	Patches
RI	Requires immediate remedial treatment

¹ A detailed description of each mode of failure is outlined in Appendix A of AGPT05: *Pavement Evaluation and Treatment Design*.

² The modes of distress highlighted in italics typically originate from the underlying pavement (except perhaps for cracks that coincide with construction joints, or potholes that coincide with areas of crocodile cracking. Distress that originates from the underlying pavement should be excluded from the evaluation.

³ Polishing is typically assessed through skid resistance testing (not visual assessment).

Table D2: Assessment marks

Mark	Description
NF	No discernible faults
NS	No significant fault
SM	Some minor faults
SF	Several faults
ST	Seriously faulted
RT	Requires remedial treatment
RI	Requires immediate remedial treatment

Note: Pass/fail criteria do not apply to visual assessments of existing sections