

Technical Note TN202

Vinyl film wrapping of traffic signal controller cabinets

October 2022

Copyright

© The State of Queensland (Department of Transport and Main Roads) 2022.

Licence



This work is licensed by the State of Queensland (Department of Transport and Main Roads) under a Creative Commons Attribution (CC BY) 4.0 International licence.

CC BY licence summary statement

In essence, you are free to copy, communicate and adapt this work, as long as you attribute the work to the State of Queensland (Department of Transport and Main Roads). To view a copy of this licence, visit: <https://creativecommons.org/licenses/by/4.0/>

Translating and interpreting assistance



The Queensland Government is committed to providing accessible services to Queenslanders from all cultural and linguistic backgrounds. If you have difficulty understanding this publication and need a translator, please call the Translating and Interpreting Service (TIS National) on 13 14 50 and ask them to telephone the Queensland Department of Transport and Main Roads on 13 74 68.

Disclaimer

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained within. To the best of our knowledge, the content was correct at the time of publishing.

Feedback

Please send your feedback regarding this document to: tmr.techdocs@tmr.qld.gov.au

1 Introduction

This Technical Note gives instruction on the use of an external vinyl film wrapping system for traffic signal controller cabinets (TSCCs). This Technical Note aims to specify the minimum and desirable requirements for the use of externally-applied vinyl cast film wrapping system for TSCCs.

This document describes the application and removal of vinyl cast film wrapping system for TSCCs to avoid the potential damage. This Technical Note must comply with the requirements of Australian Standard AS 2578 *Traffic signal controllers* (AS 2578), [Technical Specification MRTS201 General equipment requirements](#) (MRTS201) and other relevant Transport and Main Roads Technical Specifications and Australian Standards.

A vinyl wrap may be desirable as a deterrent for graffiti or tagging on a TSCC. Busy artwork will assist with this as it makes the graffiti or tag less visible.

This Technical Note does not cover the requirements for safety and risk management and shall be read in conjunction with the *Electrical Safety Act 2002* (Qld), the Electrical Safety Regulation 2013 (Qld), the Queensland [Manual of Uniform Traffic Control Devices](#) (Queensland MUTCD) Part 3 and MRTS201 as appropriate.

This Technical Note does not cover the content requirements for the artwork depicted on, or the contractual agreement for the supply and installation of, the vinyl wrap.

1.1 Application and submission

Applications for assessment of vinyl product materials shall be made to:

Traffic Engineering Technology and Systems

Engineering & Technology Branch

Department of Transport and Main Roads

Email: ITS_Electrical_Technology@tmr.qld.gov.au

Website: [Intelligent transport systems and electrical](#) (Department of Transport and Main Roads).

2 Reference documents

The documents listed in Table 2 should be referenced to gain a better understanding of the wrapping system suitability and application.

Table 2 – Referenced documents

Reference	Title
AS 2578	Australian Standard AS 2578 <i>Traffic signal controllers</i>
AS/NZS 1580.403.1	Australian and New Zealand Standard AS/NZS 1580.403.1 <i>Paints and related materials – Methods of test, Method 403.1: Scratch resistance</i>
AS 1580.403.2	Australian Standard AS 1580.403.2 <i>Paints and related materials – Methods of test, Method 403.2: Abrasion resistance</i>
AS/NZS 1580.457.1	Australian and New Zealand Standard AS/NZS 1580.457.1 <i>Paints and related materials – Methods of test Method 457.1: Resistance to natural weathering</i>
AS 1580.408.4	Australian Standard AS 1580.408.4 <i>Paints and related materials – Methods of test, Method 408.4: Adhesion (crosscut)</i>

Reference	Title
AS 1580.408.5	Australian Standard AS 1580.408.5 <i>Paints and related materials – Methods of test, Method 408.5: Adhesion – Pull-off test</i>
MRTS201	Transport and Main Roads Technical Specification MRTS201 General Equipment Requirements
MRTS226	Transport and Main Roads Technical Specification MRTS226 <i>Telecommunications Field Cabinets</i>
MRTS252	Transport and Main Roads Technical Specification MRTS252 <i>Next Generation Traffic Signal Controllers</i>
Queensland MUTCD	Queensland Manual of Uniform Traffic Control Devices
SD1673	Transport and Main Roads Standard Drawing SD1673 Traffic Signals / Road Lighting – Labels
MRWA 6706-02-2238	Main Roads Western Australia technical and design guidelines <i>Testing method for anti-graffiti products</i>
Avery Dennison	Film zoning map
Arlon	Film zoning map
Orafol	Film climate map
Electrical Safety Act	Electrical Safety Act 2002 (Qld)
Electrical Safety Regulation	Electrical Safety Regulation 2013 (Qld)
NCC	National Construction Code
ABCB	Australian Building Codes Board
BOM	Bureau of Meteorology

3 Film wrapping systems

3.1 General

The vinyl film wrapping of TSCCs is in addition to the requirements outlined in AS 2578 and MRTS201. The finish and protection shall be vandal-proof (anti-graffiti), anti-glare, and non-reflective. The film wrap system, subject to approval by Transport and Main Roads, may be used to enhance the cover of cabinet housing material and finish. The finish (that is, the design, film properties, images – not limited to symbols and words, and colour and so on) shall be submitted to Transport and Main Roads for review and evaluation. The vinyl wrapping system shall maintain the cabinet's minimum ingress protection of IP45 and shall not interfere with a TSCC's intended functionalities.

3.1.1 Vinyl film systems

Only digitally-printable cast vinyl with removable adhesive is to be used. Use of air-release film is recommended.

The application of an over-laminate film layer is recommended as it makes the print more stable, increases protection against ultraviolet (UV) radiation, temperature extremes, abrasion and cuts, graffiti, chemicals, corrosion and pollutants, natural weathering, and peeling and reduces flammability. All system components used must be compatible.

3.2 Evaluation and performance criteria

The supplier shall verify the proposed vandal proof (for example, anti-graffiti) film wrap system fulfils the claims of the manufacturer with respect to coating properties, and suitability of adhesive system to the intended substrate surface.

3.2.1 Application and removal of vinyl wrapping system

The film wrapping can be applied to all the surfaces which are publicly visible, including back and top of the TSCC. The process, method, and materials used to affix the film wrapping system to the TSCC shall not etch, corrode, damage, react, or degrade the substrate surface. This includes during the installation process, whilst affixed to the TSCC, and throughout the removal process. All coatings, treatments, and film wrapping systems shall be applied in accordance with documents referenced in Section 2 of this Technical Note, and to the manufacturer's published recommendations. The vinyl wrap shall be installed by manufacturer-accredited installers. The installer shall produce evidence that the film wrap system has been applied in accordance with the manufacturer's published recommendations.

3.2.2 Interference with cabinet operation or protection

The vinyl wrapping system shall not interfere with the operation, or inhibit functionality or the ability to perform maintenance on the TSCC. This includes, but is not limited to, door latches and facility switches, access panels, locking and key mechanisms, any sensing apparatus or equipment (that is, photocells, or communication antenna), nameplates, equipment identifiers and decals. Nameplates, equipment identifiers, and decals shall be affixed on the outside of the wrap, and clearly visible always. The application of the vinyl wrapping system shall not reduce ingress protection and shall not cover or obstruct the following (refer to Figure 3.2.2(a) and Figure 3.2.2(b)).

Figure 3.2.2(a) – Equipment identifier, Telstra link panel and facility switch and plate

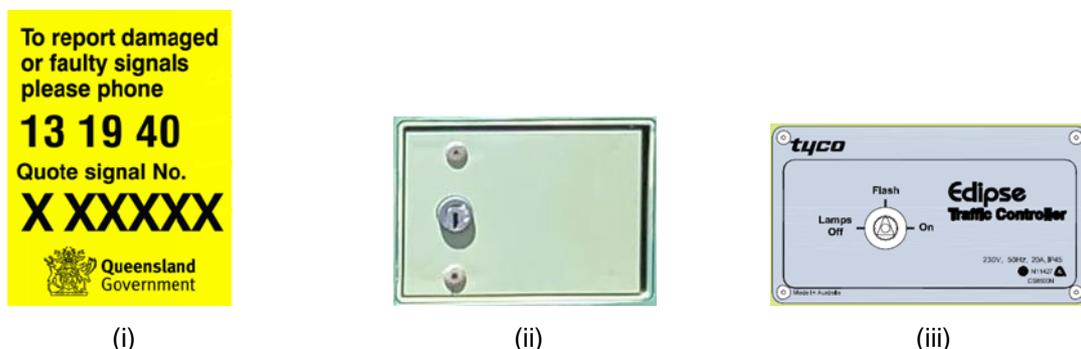


Figure 3.2.2(a)(i) – Equipment identifier

There are three options.

1. Option 1 – the equipment identifier can be included in the artwork
2. Option 2 – the equipment identifier can be stuck on top of the vinyl film after installation, or
3. Option 3 – the vinyl film can be cut around the pre-installed equipment identifier.

Figure 3.2.2(a)(ii) – Telstra link panel

The vinyl film should be cut along the rectangular panel gap: leave the film affixed but cut it off the round key slot.

Figure 3.2.2(a)(iii) – Facility switch and plate

The vinyl film should be cut around the rectangular plate and remove the film off the plate.

Figure 3.2.2(b) – Door handle, door hinge and photocell



(iv)



(v)



(vi)

Figure 3.2.2(b)(iv) and (v) – Door handle and door hinge

The vinyl film should be cut around the door handle and door hinge: remove the film.

Figure 3.2.2(b)(vi) – Photocell

The vinyl film should not block the photocell. To avoid this, the installer should be mindful about the slots between panels not covered with vinyl film.

3.2.3 Zone system

According to the *National Construction Code* (NCC) and the Australian Building Codes Board (ABCB), the following eight climate zones are created using data from the Bureau of Meteorology (BOM):

1. Zone 1 – hot humid summer warm winter
2. Zone 2 – warm humid summer mild winter
3. Zone 3 – hot dry summer mild winter
4. Zone 4 – hot dry summer cold winter
5. Zone 5 – warm temperate
6. Zone 6 – mild temperate
7. Zone 7 – cool temperate, and
8. Zone 8 – alpine.

Zones 1, 2, 3 and 5 apply in Queensland. In these zones, the average annual maximum temperature varies from 21°C in the south to 39°C in the north, with highest recorded temperature of 49.8°C and lowest of -10.6°C. The average annual relative humidity varies from 30% in the south to 100% in the

north. The average maximum annual solar exposure for Queensland varies from 16 MJ/m² in the south to 24 MJ/m² in the north, but daily minimum can be as low as 3 MJ/m² and daily maximum can be as high as 30 MJ/m². These data are taken from the [BOM website](#).

3.2.4 Warranty and durability

The actual performance life of the vinyl film wrapping system depends on a variety of factors, including:

- zone the product is installed
- selection and preparation of the substrate
- angle and direction of exposure
- application methods
- environmental conditions, and
- cleaning and maintenance of the films.

Where films are applied in areas of high temperatures or humidity, in industrially-polluted areas, or other areas with air-laden particulate matter, the durability of the film will be reduced.

3.2.5 Examination and documentation

Vinyl wrapping materials shall be subject to examination by Transport and Main Roads and shall be accompanied by certificates of supply stating the place, date, and quantity of manufacture, including appropriate batch numbers, to permit full traceability of product.

3.2.5.1 Submission of documentation

The external wrapping system shall only be considered by Transport and Main Roads when a written submission is made to the department, and includes the following:

- a) documentation in accordance with the following attributes (refer to Table 3.2.5.1) to validate claimed performance.
- b) the manufacturer's specification and published recommendations for the product and its use (for example, Product Data Sheets, technical bulletins, and Performance Guarantee)
- c) the manufacturer's Safety Data Sheets for the product
- d) the manufacturer's certificate of accreditation for the printing equipment and process used to apply artwork
- e) the manufacturer's certificate of accreditation for the installer, and
- f) site location and photographs with latitude and longitudinal coordinates, cadastral or street details, with the make, model, brand of the cabinet the wrap is intended to be applied.

In addition to these, the relevant [Transport and Main Roads District](#) may also require the proposed design, including detailed dimensions and layout (for example, visual / graphic layout, colour, shape, size, and nature of content).

Table 3.2.5.1 – External wrapping system performance attributes

General	Description
Base film	
Printability	53 micron, digitally printable, premium-quality, Supercast™ vinyl film Aqueous, solvent, eco-solvent, latex, UV-curable
Adhesiveness	Dark grey adhesive provides extra opacity for block-out performance Permanent, pressure-sensitive, acrylic base, non-corrosive, and non-etching
Removability	Long-term clean removability up to 5 years from date of installation, without leaving any residue (ensure manufacturer's directions and procedures are followed) – the process to remove the wrapping system shall not damage the substrate painted surface of the TSCC
Air egress	Air egress channels – Bubble- and wrinkle-free application
Slidable	For easier repositioning during application
Overlamine	
Attributes	30 micron, premium quality, ultra-thin, super-conformable cast film Gloss finish Low reflectivity Anti-glare Degree of resistance to the following: <ul style="list-style-type: none"> • graffiti / vandalism • UV radiation • abrasion and scratch • peeling, and • natural weathering
Anti-graffiti	Spray paint, markers, adhesives, and acid etching
Chemical resistant	Anti-graffiti cleaning solvents, most petroleum products including oils and greases, mild acid and alkalis, and salt spray (salt spray 2.0–3.0 g/m ² (as per MRTS201))
Wrapping system requirements	
Print and overlamine layer compatibility	The vinyl system components used must be compatible
Zones (zones to be determined as per information provided)	Zones to be determined by the manufacturer / supplier / installer, based on information provided in Section 3.2.3 <i>Zone system</i> of this Technical Note
Application suitability	Flat, simple
Ambient temperature range	-15°C to 55°C (product shall be capable for installation for this range)
Removal process	The process to remove the wrapping system shall not damage the substrate painted surface of the TSCC
Flammability	Self-extinguishing

