



Australian Government

CPCCSG3011 Install LED technology into signs

Release: 1

CPCCSG3011 Install LED technology into signs

Modification History

Release 1.

This version first released with CPC Construction, Plumbing and Services Training Package Version 2.

Revised unit of competency. Replaces superseded non-equivalent CPCCSI3011A Use LED technology for signage, CPCCSI3012A Apply electrical theory for illuminated signage, and CPCCSI3013A Install LED systems.

Application

This unit of competency specifies the outcomes required to select and install light emitting diode (LED) systems into signs. It covers identifying the appropriate LED system to achieve job requirements, laying out and installing the system into position, and connecting and circuit testing the system to ensure consistent distribution of light.

The unit supports sign manufacturers producing illuminated signs. It applies to signs illuminated using LED technology, including light boxes and fabricated letters which, depending on how the modules are positioned inside the letter, will produce either face-illuminated or halo-lit signs.

Where LED lighting is less than 240 volts, no licensing, legislative, regulatory or certification requirements apply to this unit of competency at the time of endorsement. Should lighting be above 240 volts, relevant state and territory regulatory authorities should be consulted to confirm licensing, legislative, regulatory or certification requirements that apply to this unit of competency.

Pre-requisite Unit

Nil

Competency Field

Signs and graphics

Unit Sector

Construction

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of

conditions.

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|---|---------------------------------|-----|--|
| 1 | Plan and prepare work. | 1.1 | Job requirements are identified from specifications and client brief, confirmed, and applied to planning and preparation. |
| | | 1.2 | Sign installation details are identified and applied to planning. |
| | | 1.3 | Tools, equipment and materials are selected to carry out tasks consistent with job requirements, and faults are identified and rectified before starting work. |
| | | 1.4 | Health and safety requirements are identified and applied to planning according to job requirements. |
| | | 1.5 | Statutory and local authority requirements relating to the display of illuminated sign are identified and applied to planning. |
| | | | |
| 2 | Select and prepare LED modules. | 2.1 | LED system is selected according to job specifications and prepared for use. |
| | | 2.2 | Quantity of transformers required is calculated according to job specifications, and type of LED system is selected. |
| | | | |
| 3 | Fix LED system to sign. | 3.1 | Sign is checked to be free of damage, and is cleaned and allowed to dry. |
| | | 3.2 | LED modules are laid out and checked for completeness according to manufacturer recommendations. |
| | | 3.3 | LED modules are safely fixed to sign according to type of illumination required and manufacturer specifications. |
| | | 3.4 | Unused wires are safely capped or looped to avoid creating shadows on sign face. |
| | | | |
| 4 | Connect and test LED wires | 4.1 | Module wires are connected to transformers and regulated according to manufacturer specifications. |
| | | 4.2 | Module wires are tested to be fully functioning and any |

defects are identified and rectified.

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|---|--------------------------|-----|--|
| 5 | Position and check sign. | 5.1 | Sign is mounted to surface or placed into position according to job requirements. |
| | | 5.2 | Sign is illuminated and checked for consistent distribution of light according to job requirements. |
| | | 5.3 | Inadequately lit areas of the sign and possible causes are identified and lighting is rectified according to job requirements. |
| 6 | Clean up. | 6.1 | Finished sign and surrounding surface area are cleaned and waste materials removed according to statutory and regulatory authority requirements. |
| | | 6.2 | Tools and equipment, including personal protective equipment (PPE), are cleaned, maintained and stored according to workplace requirements. |

Foundation Skills

This section describes the language, literacy, numeracy and employment skills essential to performance in this unit but not explicit in the performance criteria.

Skill

Performance feature

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|-------------------------------|---|
| Learning skills to: | <ul style="list-style-type: none"> • access a range of manufacturer support material to identify: <ul style="list-style-type: none"> • changing technology in LED systems • required approach to installing LED systems into signs. |
| Numeracy skills to: | <ul style="list-style-type: none"> • calculate: <ul style="list-style-type: none"> • depth of sign and apply to selection of appropriate LED system • required number of transformers and other elements used when installing LED into signs. |
| Oral communication skills to: | <ul style="list-style-type: none"> • identify and confirm lighting requirements. |

This section describes the language, literacy, numeracy and employment skills essential to performance in this unit but not explicit in the performance criteria.

Skill	Performance feature
Reading skills to:	• interpret manufacturer instructions and recommendations relating to layout and connection of LED systems.
Writing skills to:	• report faults in LED systems and components to manufacturers and other relevant personnel using relevant documentation.
Problem-solving skills to:	• identify possible causes of faults in signs illuminated with LED technology and trial appropriate solutions.

Range of Conditions

This section specifies work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included. Bold italicised wording, if used in the performance criteria, is detailed below.

<i>Job requirements</i> must include:	• lighting durability expectations • location of sign • quality of light required: • brightness • colour • lighting effect • surface material to which sign is to be fixed • type and dimensions of sign.
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<i>Tools and equipment</i> must include at least three of the following:	• caulking gun • circuit testing equipment • electrical connection tools • measuring tape • PPE suited to working with LED technology • soldering tools • wire strippers.
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Materials must include:

- LED lighting system
- LED modules.
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Health and safety requirements must include:

- selection, correct fitting, and use of PPE prescribed under legislation, regulations and workplace policies and practices
- emergency procedures, including:
 - evacuation
 - first aid
 - location and use of firefighting equipment
- contents of and terms used in safe work method statements (SWMS) for the safe use of tools and equipment
- hazard identification and risk control procedures
- safe operating procedures, including operational risk assessment and treatments associated with:
 - soldering
 - working with low voltage electrical wires
 - working with power
- workplace environmental requirements.

Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad>

Assessment Requirements for CPCCSG3011 Install LED technology into signs

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Performance Evidence

A person demonstrating competency in this unit must satisfy all of the elements, performance criteria and foundation skills of this unit, and must select and install light emitting diode (LED) systems into three signs as follows:

- two fabricated lower case 'b' in Helvetica font, measuring at least 600 mm high x 75 mm wide, and 100 mm deep and mounted to a white surface:
 - one must be face illuminated, with the face of the letter formed of opal acrylic and the back of the letter with a PVC foam backing
 - one must be halo lit, with the sides and face of the letter formed of non-illuminating cast acrylic and the back of the letter formed of clear acrylic
- one freestanding back lit light box measuring up to 1800 mm x 300 mm x 100 mm, with an opal acrylic face.

In doing the above work, the person must:

- identify and confirm client requirements for the finished job, including:
 - colour and brightness requirements
 - location for finished sign
 - quality and performance requirements of finished sign
- lay out, install and secure the LED modules to each sign to ensure even and consistent lighting
- test lights and correct any faults in light distribution.

Knowledge Evidence

A person demonstrating competency in this unit must demonstrate knowledge of:

- application and use of:
 - safety data sheets (SDS) when working with LED components
 - safe work method statements (SWMS) when installing LED systems into signs

- capacity of different surface types to absorb or reflect LED light
- electrical theory relevant to selecting and using LED technology for signs, including:
 - processes to calculate maximum driver loading for LED modules
 - regulation of electrical current in LED systems
- principles and application of design and layout theory relevant to sign manufacture, including:
 - balance
 - colour and colour harmony
 - contrast
- use, application and limitations of red, green and blue (RGB) colour system in LED signs
- limitations of sign manufacturer's role when working with electrical components, including licensing and regulatory requirements applicable to working with electricity
- pitch as it relates to positioning LED modules in fabricated letters and light boxes
- requirements for working safely around power sources, services and assets
- techniques for evaluating and using:
 - LED systems and packages
 - LED components
- uses, applications and limitations of LED technology for illuminating signs, including:
 - colour types and limitations
 - components
 - durability
 - semi-conductor chip technology characteristics
 - systems and system packages
- processes to manage heat generated by LED
- terminology used in manufacture of signs.

Assessment Conditions

Suitable assessment of performance requires:

- equipment and tools:
 - as listed in the range of conditions
- materials:
 - as listed in the range of conditions
- specifications:
 - fabricated letters as specified in the performance evidence
 - light box as specified in the performance evidence
 - SDS
 - SWMS
- contingencies:
 - processes to identify and rectify faults in LED systems and uneven distribution of light
- timeframe:

- according to job requirements.

Assessor requirements

As a minimum, assessors must satisfy the assessor requirements in the Standards for Registered Training Organisations (RTOs) current at the time of assessment.

Links

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