



**DANLEY**™

**Implement Protection Caps  
for Reinforcing Bars**

**Life**

**Guard**™

**Product Guide**

Refer to the back of this  
product guide for contact information.



# Danley Systems

## Life Guard™

### Danley's Impalement Protection Caps for Reinforcing Bars

*"Research carried out following the incident included tests that involved dropping a 20 kg bag of sand one metre onto a vertical reinforcement bar. This showed that standard rebar-caps provide little, if any, protection against impalement on reinforcement bars should a person fall against them, even for a fall on the same level."*

In 2006, New South Wales WorkCover, with the NSW Master Builders Association and the Construction Forestry Mining & Energy Union, and WorkSafe Victoria issued Safety Alerts for rebar caps.

The alerts were issued following the impalement of a person who fell on to an exposed reinforcing bar fitted with a rebar-cap.

While these risks are commonly encountered on construction sites, they can also be seen in residential, farming and industrial environments.

In addition to site hazards presented by the exposed ends of small diameter reinforcing bars, impalement potential from large diameter rebars, holding-down bolts, star pickets and other projecting obstacles also needed to be addressed.



This product meets the building code requirements for durability B2 Durability, B2.3.1

# Research & Development

**Life Guard™**

Over the past years, the R&D staff at Danley® Construction Products have been working to develop and refine an effective anti-impalement cap for reinforcing bars and star pickets.

Hundreds of hours of effort and a large amount of funds have been invested in designing, scrutinizing, prototyping and testing numerous ideas, materials and models until an appropriate solution has been achieved.

Two specific sizes of Life Guard™ caps have been developed:

- ▶ One to suit bars from 12 to 20 mm nominal diameter [Yellow], and
- ▶ One to suit 24 to 36 mm nominal diameter bars plus star pickets [Orange]

Because the Australian and New Zealand Standards and the State and Territory Workplace Health and Safety Regulations are silent on the performance requirements of such safety devices, Danley had to go further afield to find an authoritative test regime that should satisfy Australian and New Zealand safety officials. California Occupational Safety and Health Regulations [Cal/OSHA] prescribes in Section 344.90 Impalement Protection, Specifications and Testing Criteria that the protective cover:

- ▶ Have a minimum 4" x 4" [102 x 102 mm] square surface area, or have a minimum diameter of 4 -1/2" [114 mm]
- ▶ Prevent penetration of a 250 lb [113 kg] sand bag dropped from a height of 10 ft [3.05 m]
- ▶ Be installed over the sheared end of a No 4 [12 mm nominal diameter] rebar
- ▶ Drop tests to be carried out on covers placed squarely on the rebars, and on covers sitting at the maximum angle out of square

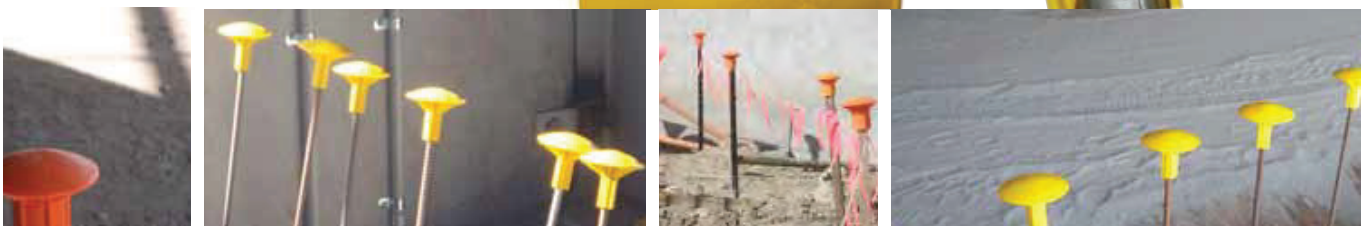


## Life Guard™ Features

- ▶ Manufactured from robust, uv-stabilised polypropylene
- ▶ Domed carapace 115 mm diameter
- ▶ Encapsulated domed steel plate 2 mm thick with central raised boss
- ▶ Internal ribs within sleeve to hold cap central on bar
- ▶ Twelve gussets between sleeve and carapace
- ▶ Longitudinal stiffening ribs incorporated into sleeve

## Why the central boss in addition to the dome shape?

Under impact, the end of the rebar is directed into the centre boss and retained there, preventing the cap from being displaced. This inhibits the bar from breaking out through the side of the sleeve.



This product meets the building code requirements for durability B2 Durability, B2.3.1



# Testing

## Life Guard™

Drop testing on Life Guard™ caps in accordance with the Cal/OSHA requirements was performed by PearlStreet, an internationally recognised, NATA accredited testing laboratory at their facility in Carole Park, Queensland.

The report also details the drop test performance of other commonly available rebar caps.

*A copy of the independent test laboratory report is available upon request.*

- ▶ Hessian-wrapped punching bag filled with sand suspended from quick-release mechanism attached to boom on fork lift. Total mass of bag was 114 kg with drop height of 3.05 m
- ▶ Life Guard™ cap fitted onto reinforcing bar
- ▶ Reinforcing bar cast into grout-filled masonry block, in turn stabilized by more grout-filled blocks



*"You've read the facts!  
Make the right choice  
and guard your life with  
Danley's Life Guard"*



Typical drop test set-up

## Results

### Drop tests 1 & 2 of 24 to 36 mm size Life Guard™ caps on N24 rebar



1. Typical effect on drop bag
2. Typical impact distress on top of cap
3. Typical impact effect inside cap showing how rebar damaged inner plastic layer and exposed encapsulated steel plate

### Drop tests 3 & 4 of 12 to 20 mm size Life Guard™ caps on N12 rebar



1. Typical cap after impact
2. Typical effect on drop bag
3. Typical impact effect inside cap

### Drop tests 5 & 6 of 24 to 36 mm size Life Guard™ caps on star picket



- 1 and 2. Typical effect on cap and drop bag
3. Typical impact effect inside cap



This product meets the building code requirements for durability B2 Durability, B2.3.1

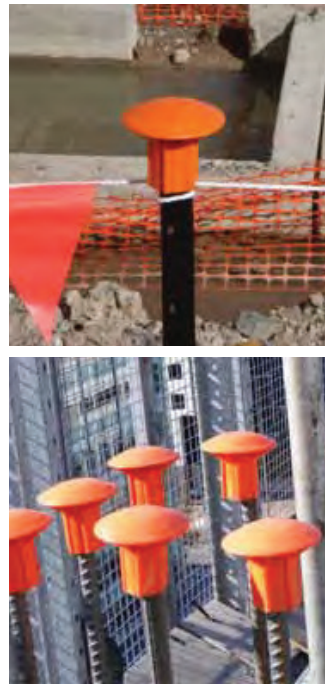
# Comparisons

## Life Guard™

Drop tests on other types of rebar caps commonly available in the market place confirmed that they are inappropriate as anti-impalement devices.



*We're committed to working with you to help protect your valuable resources.*



This product meets the building code requirements for durability B2 Durability, B2.3.1



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