

# **TIE RODS & ACCESSORIES** **DATASHEET**

# ABOUT US

**Nipras Metal Group** is a diversified private enterprise and a Saudi organization established in 2010 with a vision to be a preferred partner for our valuable clients in supplying quality and cost effective building construction and Architectural engineering solutions. Since the establishment of Nipras, we have been partnered with major organizations in the kingdom to consistently serve their projects and, we have engaged closely with many key contractors and consultants by meeting their expectations in providing high-quality and certified construction and Architectural products. **Nipras group** operates its business units from three divisions in manufacturing, supplying and sub-contracting of various Architectural products such as Roof Hatch Access, Gratings, Railings, Raised Floors, Garbage Chute System, Cable tray management solutions, and all types of stainless steel & metal fabrication and other building construction materials. The company has two production lines of Architectural products and cable management systems.



**Nipras** is accredited through various quality certifications and standards meeting all project's technical criteria and consultant approvals. We are an ISO-1519 certified company to ensure the quality, safety, and efficiency of our products. We gain trust of our existing clients and new customers with the best products, the best quality, competitive price and the most perfect service.

At **Nipras** we always strive hard to supply and meet our client's requirements with high-quality products quickly and efficiently. The company adopts modern management concept, adheres to survival by quality and development by integrity, and gradually boarded the local competition platform. We rely on service to enhance the client relationship, sincerely create value for customers, and provide customers with high-quality and reliable products and wholehearted service. Our company has advanced production equipment which guarantees the most advantageous product quality and efficiency.

# SOCIAL RESPONSIBILITY

We "NIPRAS" ability to sense, understand and react to others emotions while comprehending on social networks. (Social awareness which encompasses the competency of empathy is the ability to read nonverbal cues for negative emotions, particularly anger and fear and to judge the trustworthiness of others.



It is about understanding others feelings, not experiencing them (Garner, 2009). NIPRAS accentuates on an individual's ability to identify, perceive and react to other's emotions while being a part of the social network circuitry. NIPRAS understand the ability to and be compassionate to the feelings, views, opinions and challenges of other people. Social-awareness cannot only be equated with understanding people's need but as well as caring for them (Goleman, 2006).

## CUSTOMERS

A business cannot work without consumer. The survival and growth of business depends on consumer satisfaction, service and support.

**"NIPRAS"** winning the confidence of our customers made it possible by following a positive attitude towards customers and fulfilling our social responsibilities by providing them:

- ✓ Quality
- ✓ Fair Prices
- ✓ Honest advertising
- ✓ After sales service.
- ✓ Research & Development for their requirements.
- ✓ Safety.
- ✓ Regular supply.

## EMPLOYEES

At **NIPRAS** we empower our employees to leverage the corporate resources at their disposal to do well. Being a socially responsible company can bolster a company's image and build its brand.



## CIVIL SOCIETY

According to the Saudi Youth in Numbers report, **37%** of the Saudi population is under 25. This entails that the youth will play a more significant role in undertaking the paths set by Vision 2030 and inheriting the future it's attempting to build.

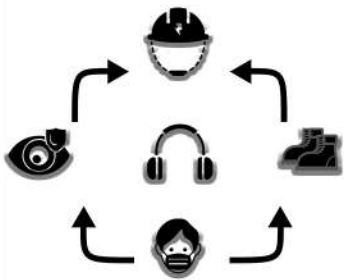
**NIPRAS** gives our platform to the young for developing their sense of civic responsibility, involvement, and interconnectedness. Opportunities to equip the upcoming generation with the necessary skills and motivation to become active participants in their communities.

## ENVIRONMENT

**NIPRAS** understands the nature of the relationship between corporate adoption of the concept of societal responsibility availability of environmental awareness, clear vision of the impact of societal responsibility on financial performance, managers informing employees of the latest developments in societal responsibility programs, managers' response to their corporate social responsibility (CSR) proposals] in the form of an annual report that supports the success of the company's objectives, the company's management encourages employees to participate collectively in societal responsibility programs and to protect the environment from pollution in the industry.

# HEALTH & SAFETY

**"NIPRAS"** as a manufacturing Company for Metal & Steel Products has a large number of hazards because of the strong internal as well as external forward and backward linkages in terms of material flows. Employees are to work in hazardous environment because of complicated equipment layouts, high temperatures, heavy equipment's, moving machinery, hazardous processes, heavy lifting and movements of materials in the work environment etc. Further, several operations involve working at heights or in confined spaces. In short, working involves both very high volume as well as the complexity of operations which results into employees getting exposed to a high level of health and safety risks.



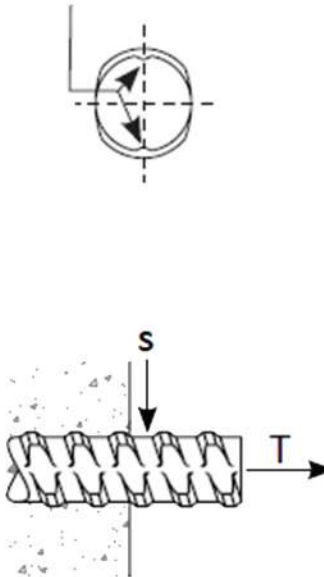
*The health, safety, and protection of our employees, equipment, and the environment are perfectly calculated and implied as a crucial since it affects both economic and social factors. On the other hand, a healthy and safe workplace contributes towards plants competitiveness as well as in profit growth.*

## TIE RODS AND ACCESSORIES\_

**NMTE** supplies Tie Bar of high quality and high load steel that is manufactured from high grade steel and features a special 'high speed' thread to reduce the time and cost of erecting and dismantling the NMTE Tie assembly. Tie Rods need not be cut to exact lengths for each job. The Tie Rod is a continuously threaded hot rolled and mill treated bar intended for formwork.

<b>Dia:</b>	15mm
<b>Mass:</b>	1.44 kg/m
<b>Code No:</b>	N-TR015
<b>Nom. Dia:</b>	15/17mm
<b>Available:</b>	Std. length (3m-6m)
<b>Dia:</b>	20mm
<b>Mass:</b>	2.56 kg/m
<b>Code No:</b>	N-TR020
<b>Nom. Dia:</b>	20/23mm
<b>Available:</b>	Std. length (3m-6m)

Identification Grooves



### 15MM TIE ROD LOAD CAPACITY

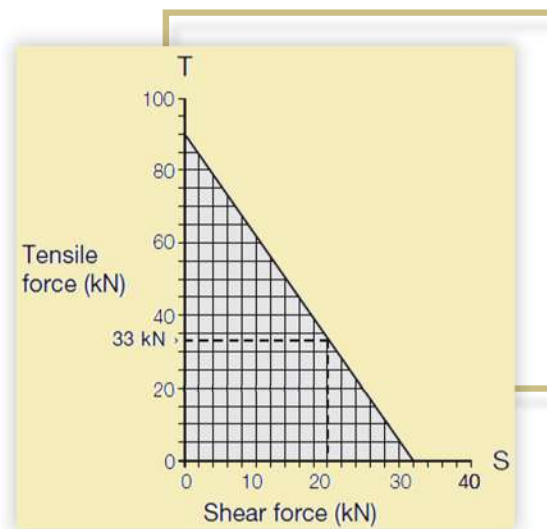
Tensile Working Load Limit = 90 kN

Shear Working Load Limit = 32 kN

For interaction between tensile force and shear force see graph opposite.

#### EXAMPLE:

At shear force  $S = 20$  kN the Tie Rod can simultaneously take a tensile force of  $T = 33$  kN.



## 20MM TIE ROD LOAD CAPACITY

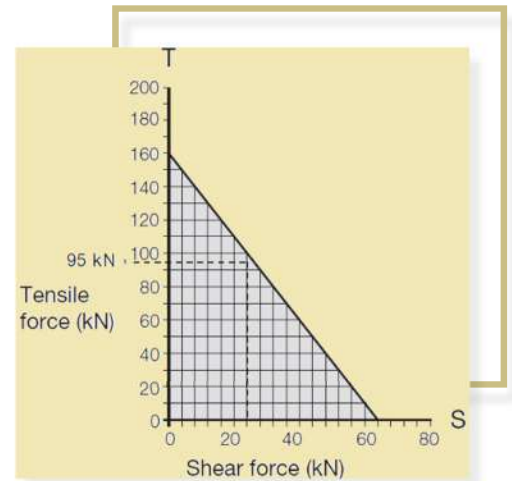
Tensile Working Load Limit = 160 kN

Shear Working Load Limit = 65 kN

For interaction between tensile force and shear force see graph opposite.

### EXAMPLE:

At shear force  $S = 26$  kN the Tie Rod can simultaneously take a tensile force of  $T = 95$  kN.



### NOTE:

- Tie Rods must not be used as a load lowering/raising device.
- When Tie is supporting the form weight in a climbing form application, the load must be applied directly at the concrete face.
- The Tie is not suitable to resist forces which impose bending moments.

### NOTE:

**Maximum capacities may be limited by other components, for example, washer and bearing stress under washer.**

- Limit State conversion factor = 1.5
- Engineering principles dictate that when members are continuous over multiple spans, the reaction at the supports are not always equal to 'Spacing x Span x Pressure', so a Reaction Coefficient must be applied when assessing the force.

#### Example:

For members continuous over 2 equal spans -

Reaction Coefficient = 1.25

For members continuous over 3 equal spans -

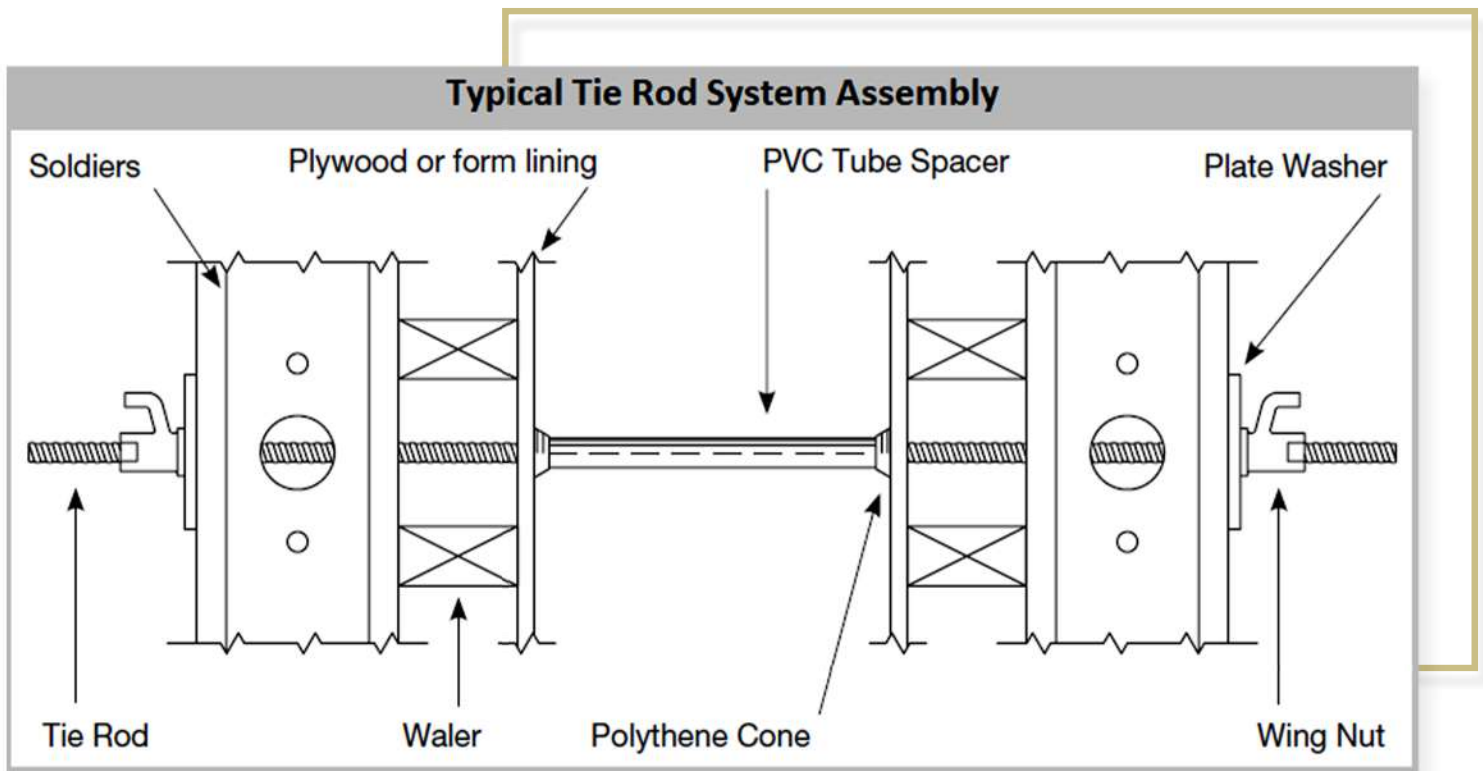
Reaction Coefficient = 1.1

(Reaction Coefficients may be applied in two directions.)

> In Formwork applications, Clause 4.5.6.3(c) of AS 3610-1995

specifies that, 'for Tension Members resisting Lateral Concrete Pressure, the forces to be used shall be increased by at least 20%'.

> The force as adjusted by the above factors must be equal or less than the WLL for that member.



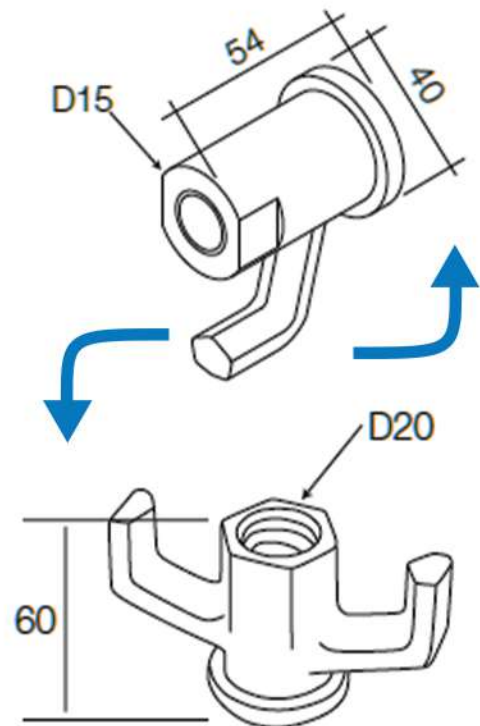
## TIE CAST WING NUT

Wing Nut is designed to spin freely on the 'high speed' thread by hand and may be tightened using either an AF spanner or a length of bar. The unbalanced, single wing design resists movement under vibration.

### TENSILE WORKING LOAD LIMIT WHEN USED WITH;

D15 HT Thru Tie Rod = 90 kN  
D20 HT Thru Tie Rod = 160 kN

<b>Wing Nut 15mm</b>	
<b>Dia:</b>	15mm
<b>Mass:</b>	0.45 kg/m
<b>Code No:</b>	N-TCWN015
<b>Wing Nut 20mm</b>	
<b>Dia:</b>	20mm
<b>Mass:</b>	0.48 kg/m
<b>Code No:</b>	N-TCWN020





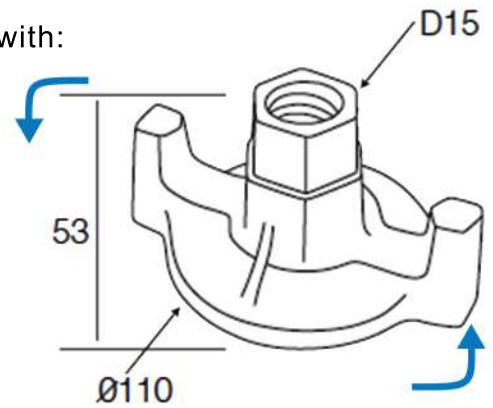
## TIE FIXED NUT WASHER

Tensile Working Load Limit when used and centrally positioned with:

Acrow Slim-Max Soldier, WLL = 50 kN

Acrow Slim-Light Soldier, WLL = 60 kN

<b>Dia:</b>	15mm
<b>Mass:</b>	0.7 kg/m
<b>Code No:</b>	N-TFNW015



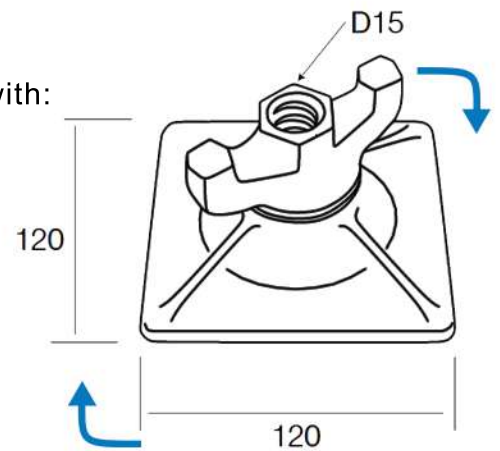
## TIE SWIVEL NUT WASHER

Tensile Working Load Limit when used and centrally positioned with:

Acrow Slim-Max Soldier, WLL = 78 kN

Acrow Slim-Light Soldier, WLL = 67 kN

<b>Dia:</b>	15mm
<b>Mass:</b>	1.08 kg/m
<b>Code No:</b>	N-TSNW015
<b>Max Inclination:</b>	15°



## TIE STEEL CONE & COLLAR

Similar to Polythene Cones but screws to 15mm diameter Tie with no spacer tube required as a result the tie is not recoverable. All the threads in the Cone must be fully engaged with Ties. The Steel Cone is removed with a socket wrench after pour.

### TENSILE WORKING LOAD LIMIT WHEN USED WITH:

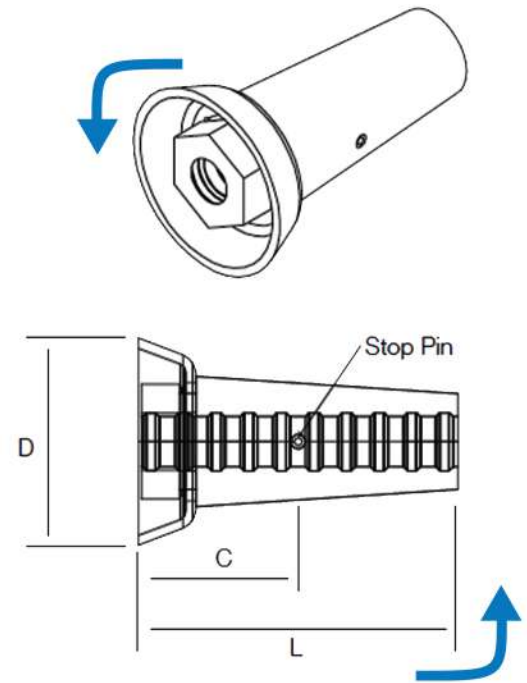
D15 Tie Steel Cone & Collar (L=75) = 50 kN

D15 Thru Tie Steel Cone & Collar (L=100) = 80 kN

## TIE STEEL CONE & COLLAR

<b>Dia:</b>	15mm
<b>Mass:</b>	0.25 kg/m
<b>Code No:</b>	N-TSCC075
<b>Length, L:</b>	75mm
<b>Concrete Cover, C:</b>	35mm
<b>D:</b>	50mm

<b>Dia:</b>	15mm
<b>Mass:</b>	0.65 kg/m
<b>Code No:</b>	N-TSCC0100
<b>Length, L:</b>	100mm
<b>Concrete Cover, C:</b>	48mm
<b>D:</b>	62mm



## TIE ROD COUPLER

**Rod Couplers** can be used to join Ties where greater lengths are required (or for economical use of cut lengths). The Rod Coupler remains buried in the concrete. The Tie Rod must be screwed hard up to the Centre deformation inside the Rod Coupler.

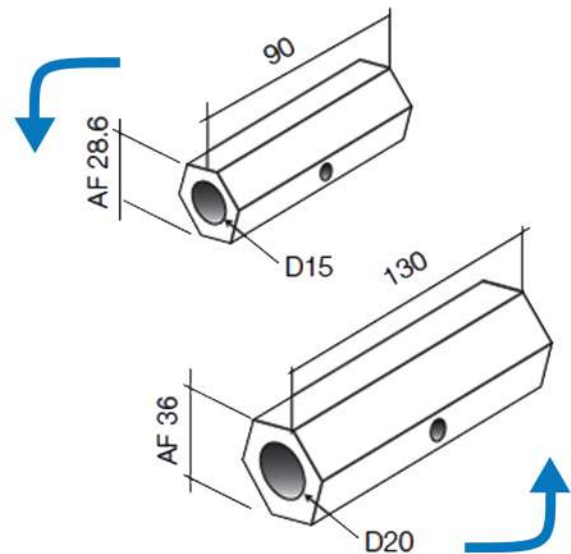
### TENSILE WORKING LOAD LIMIT WHEN USED WITH

Dia 15 Thru Tie Coupler = 90 kN

Dia 20 Thru Tie Coupler = 160 kN

<b>Dia:</b>	15mm
<b>Mass:</b>	0.34 kg/m
<b>Code No:</b>	N-TRC090

<b>Dia:</b>	20mm
<b>Mass:</b>	0.74 kg/m
<b>Code No:</b>	N-TRC0130

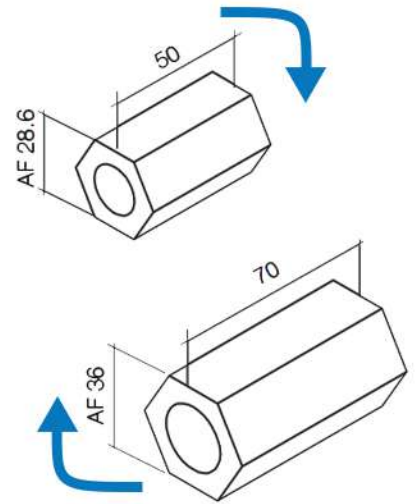


## TIE HEX NUT

Hex Nuts must not be used as a substitute for Rod Couplers.

<b>Dia:</b>	15mm
<b>Mass:</b>	0.2 kg/m
<b>Code No:</b>	N-THN050

<b>Dia:</b>	20mm
<b>Mass:</b>	0.4 kg/m
<b>Code No:</b>	N-THN070



## PVC SPACER TUBE

The expendable PVC Tube Spacer is available in 2 diameters 24.5 OD to suit the 15/17mm Tie Rod. 27.0 OD to suit the 19/21mm Tie Rod.

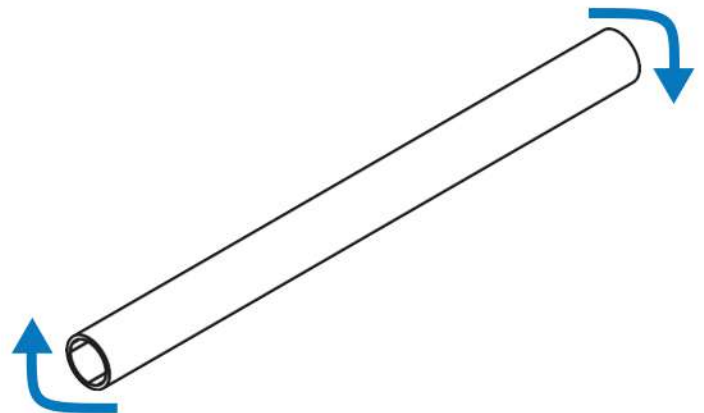
**NOTE:** When using Tie Rod, the length of the PVC Tube Spacer plus two Polythene Cones must be equivalent to the thickness of the concrete wall being constructed.

### 24.5 OD Spacer Tube

<b>Mass:</b>	70 g/m
<b>Code No:</b>	N-PST015

### 27.0 OD Spacer Tube

<b>Mass:</b>	80 g/m
<b>Code No:</b>	N-PST020

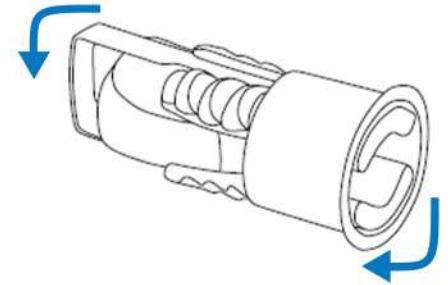


## TIE EXPANSION SHELL

Tie Expansion Shells can be used for single sided shutters or temporary tie downs in concrete.

### INSTALLATION

1. Drill hole with recommended diameter and depth. The diameter of the hole should be as small as possible.
2. Clean the borehole and remove all debris.
3. Screw the Tie Rod into the cone of the Expansion Shell.
4. Remove the plastic sleeve and insert the anchor into the borehole. The Shell should have slight contact with the borehole
5. After insertion of the anchor screw the Rod by hand (right hand thread) until the anchor is fixed and cannot be moved further.
6. Fill the borehole with cement grout.

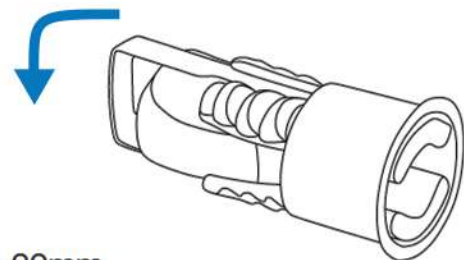


Dia:	15mm
WLL*	40.2kN Tension
Drilled Hole Dia:	35-37mm
Min Eff. Anchor Depth:	200mm
Min Anchor Hole Depth:	290mm
Min Compressive Strength $f'_c$ :	25MPa
Min Edge Distance:	300mm
Min Spacing:	600mm

*This is an estimate of Working Load Limit for pull out force in 25MPa concrete. NMTE recommends to perform pull out tests on site.*

Dia:	15mm
Mass:	0.3 kg
Code No:	N-TES015

Dia:	20mm
Mass:	0.4 kg
Code No:	N-TES020

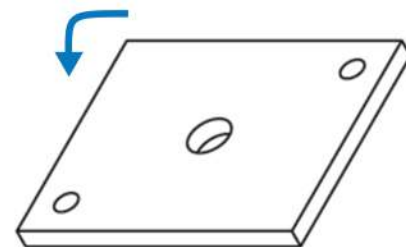


Dia:	20mm
WLL*	73.8kN Tension
Drilled Hole Dia:	51-53mm
Min Eff. Anchor Depth:	300mm
Min Anchor Hole Depth:	420mm
Min Compressive Strength $f'_c$ :	25MPa
Min Edge Distance:	450mm
Min Spacing:	900mm

## PLATE WASHERS

Working Load Limit when used and centrally positioned with:  
Slim-Max Soldier, WLL = 50 kN  
Slim-Light Soldier, WLL = 65 kN

Working Load Limit when used and centrally positioned with:  
Slim-Max Soldier, WLL = 80 kN  
Slim-Light Soldier, WLL = 68 kN



125x100x8mm Plate Washer is shown. ↗

### 125x100x8mm Plate Washer

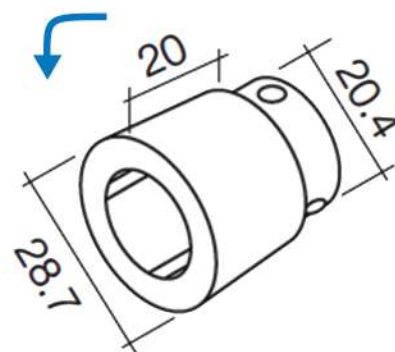
<b>Mass:</b>	0.8 kg
<b>Code No:</b>	N-PWAS001

### 130x130x12mm Plate Washer

<b>Mass:</b>	1.6 kg
<b>Code No:</b>	N-PWAS003

## POLYTHENE CONES

Removable after use. These 'push-fit' Polythene Cones fit on the ends of the PVC Tube Spacer. Available in two sizes to suit the 24.5 and 27.0mm OD spacer tube. The plastic cone leaves a clean-edged neat hole which can be filled with concrete plugs.



HD Cone to suit 24.5mm OD Spacer Tube is shown ↗

### To suit 27.0 OD Spacer Tube

<b>Mass:</b>	1.0 kg per pack of 100
<b>Code No:</b>	N-TPLC020

### To suit 24.5 OD Spacer Tube

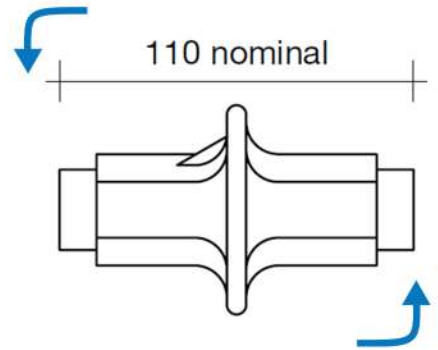
<b>Mass:</b>	0.8 kg per pack of 100
<b>STD Code No:</b>	N-TPCB001
<b>HD Code No:</b>	N-TPLC015

## WATER BARRIER

The Water Barrier is used to provide a water tight seal between the two sides of a concrete wall. It is used in conjunction with 15mm diameter Tie Rod, Polythene Cones, PVC Tube Spacers and Water Barrier Sleeves to allow recovery of the Tie Rods. With this arrangement, it is suitable for wall thicknesses greater or equal to 200mm. The Tie Rod must be screwed hard up to the Centre plate.

**Tensile Working Load Limit = 85 kN**

<b>Dia:</b>	15mm
<b>Mass:</b>	0.5 kg
<b>Code No:</b>	N-TWB001

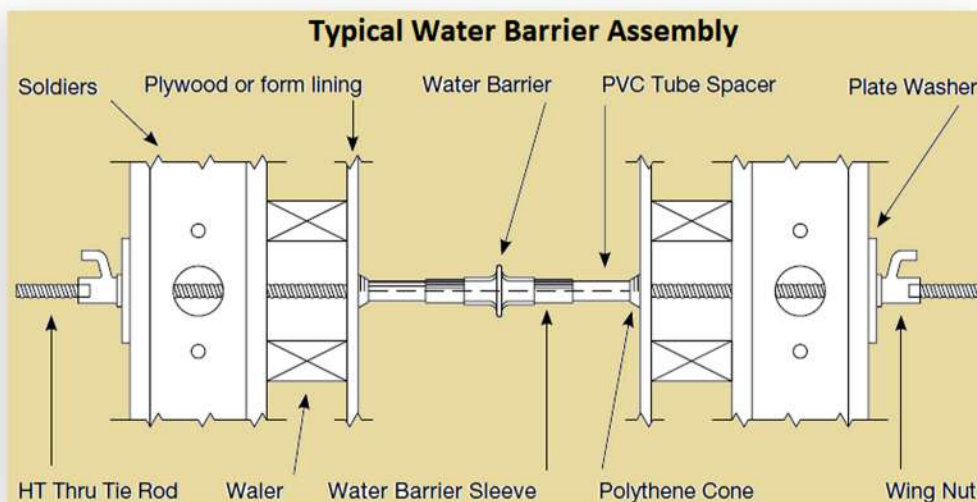
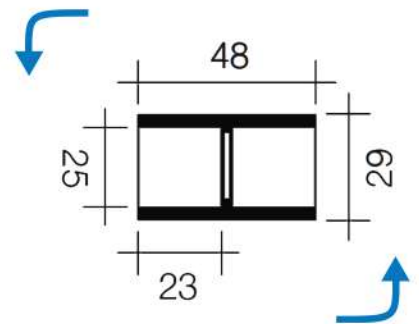


## WATER BARRIER SLEEVE

(Clipsal Coupling 242/25)

Water Barrier Sleeve, a plastic sleeve used in the recovery of Tie Rods when Water Barriers are used. All dimensions are nominal.

<b>Mass:</b>	1.46 kg per 100pk
<b>Code No:</b>	N-TWBS001



# NMG NIPRAS METAL GROUP



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NIPRAS METAL TRADING Co.



شركة نبراس المعادن للصناعة  
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