

Invitation to Bid No. :

Specification No. : R-167/2542

C Material, equipment, and specifications for GALVANIZED STEEL WIRE

C1 General material and packing instructions

Additional to the general instructions, the following shall be observed :

1a Scope

These specifications cover galvanized steel wire, i.e., galvanized steel wire strands and galvanized steel solid wire.

1b Standard

The galvanized steel wire strands shall be manufactured and tested in accordance with the latest TIS 404 .

The galvanized steel solid wire shall be manufactured and tested in accordance with the latest TIS 71 .

1c Principal requirement

The Class and Grade of galvanized steel wire strands, and the Type of galvanized steel solid wire are stated in **C3 Schedule of detailed requirement**, see Page 5 .

Free samples shall be supplied on request. The samples will not be returned.

1d Packing

1d.1 The galvanized steel wire strands 50 mm² and 95 mm² shall be packed in coil of 300 m standard length per coil with a tolerance of $\begin{matrix} +15 \\ 0 \end{matrix}$ m .

The galvanized steel solid wire shall be packed in coil of 50 kg standard weight per coil with a tolerance of $\begin{matrix} +3 \\ 0 \end{matrix}$ kg .

Each coil shall be wrapped with polythene and gunny, or equivalent, with two (2) tags on each side of the package.

1d.2 The galvanized steel wire strand 25 mm^2 shall be packed on wooden reel, of 2,000 m standard length per reel with a tolerance of $+100_0$ m .

The galvanized steel wire strand 35 mm^2 shall be packed on wooden reel, of 1,500 m standard length per reel with a tolerance of $+75_0$ m .

Reels shall be non-returnable wooden reels with hub reinforcements. Reels shall be lagged with suitable wooden boards to protect the galvanized steel wire against damage. After lagging, a galvanized steel solid wire or a steel strap shall be fitted to the lags over each flange of the reel. Overall outside diameter of reel shall not exceed 1.5 m .

If the wooden parts of reels are made of rubber wood (Yang-para), the wooden parts shall be treated with water-borne wood preservatives, Chromated Copper Arsenate (CCA), according to Group 3 of the latest TIS 515, see **Table 1**, to a dry net salt retention of 12.0 kg/m^3 .

1d.3 On acceptance, unless otherwise agreed, PEA shall calculate the delivered galvanized steel wire by using standard length and standard weight, (300 m per coil, 1,500 m per reel, 2,000 m per reel, or 50 kg per coil; excluding tolerance); and the package having quantity not corresponding to the tolerance may not be accepted.

Table 1
Active Ingredients of CCA

Description	TIS 515 - 2527		
	Group 3		
	Type 1	Type 2	Type 3
Copper, as CuO %	16.0 - 20.9	18.0 - 22.0	17.0 - 21.0
Chromium, as CrO ₃ %	59.4 - 69.3	33.0 - 38.0	44.5 - 50.5
Arsenic, as, As ₂ O ₅ %	14.7 - 19.7	42.0 - 48.0	30.0 - 38.0

C2 Material and packing data to be given by bidder

For each item offered, the following details shall be submitted with the bid :

2a Details of galvanized steel wire

Construction of galvanized steel wire.

Properties :

Applied standard	TIS	
Nominal cross-sectional area	mm ²	
Minimum actual cross-sectional area	mm ²	
Overall diameter $\pm$ tolerance	mm $\pm$ mm	
Diameter of wire $\pm$ tolerance	mm $\pm$ mm	
Number of wires	-	
Mass, approximately	kg/km	
Minimum tensile strength of wire	MPa	
Maximum tensile strength of wire	MPa	
Minimum weight of zinc-coating	g/m ²	
Minimum breaking strength	N	
Minimum number of immersion in uniformity test	-	
Number of close turns around the cylindrical mandrel/diameter of mandrel	turns/mm	

2b Drawing of tag and/or samples of tag, with inscription on the tag.

2c Packing details_

Packing method (shown by drawing(s)) .

Number of coils or reels.

Principal dimensions of each coil or reel in cm .

Volume of each coil or reel in m³ .

Gross weight of each coil or reel in kg .

Net weight of each coil or reels in kg .

Length and tolerance of uncut galvanized steel wire strand per coil or reel in m .

Weight and tolerance of uncut galvanized steel solid wire per coil in kg .

Properties of Galvanized Steel Wire

Description	TIS 404-2540					TIS 71-2532
	Galvanized Steel Wire Strand, Utility Grade, Class 1					Galvanized Steel Solid Wire , Type B
Nominal cross-sectional area	mm ²	25	35	50	95	-
Minimum actual cross-sectional area ⁽¹⁾	mm ²	22.43	31.67	46.24	85.95	-
Overall diameter $\pm$ tolerance	mm	6.30	7.50	9.00	12.50	4.00 $\pm$ 0.10
Diameter of wire $\pm$ tolerance	mm	2.1 $\pm$ 0.08	2.5 $\pm$ 0.10	3.0 $\pm$ 0.10	2.5 $\pm$ 0.10	4.00 $\pm$ 0.10
Number of wires	-	7	7	7	19	1
Mass, approximately ⁽²⁾	kg/km	192	272	392	740	-
Minimum tensile strength of wire	MPa	-	-	-	-	300
Maximum tensile strength of wire	MPa	-	-	-	-	550
Minimum weight of zinc-coating	g/m ²	214	214	259	214	153
Minimum breaking strength	N	16,150	22,850	32,900	62,000	-
Minimum number of immersion in uniformity test	-	-	-	-	-	3
Number of close turns around the cylindrical mandrel/ diameter of mandrel	turns/mm	2/6.3	2/7.5	2/9.0	2/7.5	6/48.0

Remarks

- 1) Calculated from wire diameter of minus tolerance.
- 2) Calculated on a specific gravity for galvanized wire of 7.83 g/cm³.
- 3) Galvanized steel wire strands, TIS 404-2540, are graded according to breaking strength into five(5) grades, and Galvanizing divided onto three (3) classes according to the Zinc coating weights.
- 4) Galvanized steel solid wires, TIS 71-2532, are divided into Type A and Type B according to the zinc coating weights.

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C3 Schedule of detailed requirement

Item	PEA Material No.	Quantity	Description
1	1010100000		Galvanized steel solid wire, Type B, 4.00 mm diameter.
2	1010100002		Galvanized steel wire strand, Utility Grade (ชั้นคุณภาพเอนกประสงค์), Class 1 (ระดับการเคลือบสังกะสี ก), 25 mm ² .
3	1010100003		Galvanized steel wire strand, Utility Grade (ชั้นคุณภาพเอนกประสงค์), Class 1 (ระดับการเคลือบสังกะสี ก), 35 mm ² .
4	1010100004		Galvanized steel wire strand, Utility Grade (ชั้นคุณภาพเอนกประสงค์), Class 1 (ระดับการเคลือบสังกะสี ก), 50 mm ² .
5	1010100006		Galvanized steel wire strand, Utility Grade (ชั้นคุณภาพเอนกประสงค์), Class 1 (ระดับการเคลือบสังกะสี ก), 95 mm ² .
			Note : Enclosed "Properties of Galvanized Steel Wire" according to TIS, one (1) page.
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Manufacturer :
Trade-mark :
Country of origin :
Bidder :
Bid No.:
Date :

C4 Price schedule

Item	PEA Material No.	Catalogue No.	Description	Quantity	Unit Cost (See details & conditions attached)	Total Cost (See details & conditions attached)
1	1010100000		Galvanized steel solid wire, Type B, 4.00 mm diameter.			
2	1010100002		Galvanized steel wire strand, Utility Grade (ชั้นคุณภาพเอกประสิทธิ์), Class 1 (ระดับการเคลือบสังกะสี ก), 25 mm ² .			
3	1010100003		Galvanized steel wire strand, Utility Grade (ชั้นคุณภาพเอกประสิทธิ์), Class 1 (ระดับการเคลือบสังกะสี ก), 35 mm ² .			
4	1010100004		Galvanized steel wire strand, Utility Grade (ชั้นคุณภาพเอกประสิทธิ์), Class 1 (ระดับการเคลือบสังกะสี ก), 50 mm ² .			
5	1010100006		Galvanized steel wire strand, Utility Grade (ชั้นคุณภาพเอกประสิทธิ์), Class 1 (ระดับการเคลือบสังกะสี ก), 95 mm ² .			
	II					