इंटरनेट मानक

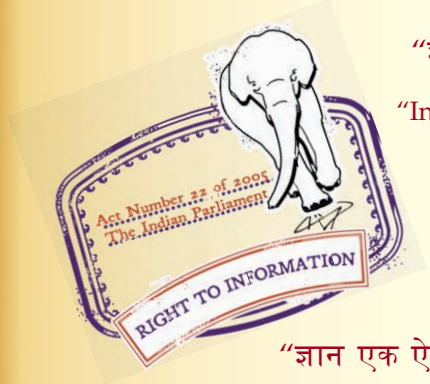
Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 2361 (2002): Bulldog Grips [MED 10: Wire Ropes and Wire Products]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

IS 2361 : 2002
(Reaffirmed 2001)

भारतीय मानक

बुलडोग ग्रिप — विशिष्टि

(तीसरा पुनरीक्षण)

Indian Standard

BULLDOG GRIPS — SPECIFICATION

(Third Revision)

ICS 77.140.65

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 2002

Price Group 3

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Wire Ropes and Wire Products Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1963, and revised in 1970 and 1994. The experience gained in implementation of the second revision of the standard necessitated this revision. In this third revision use of zinc of grade Zn 98 has been replaced by zinc containing at least 98.5 percent.

Bulldog grips when properly applied, afford a simple and effective mechanical means of securing the end of a wire rope as an alternative to splicing or socketing in the absence of skilled labour or facilities necessary for such work. They are also useful for securing the ends of temporary ropes and ropes which may need adjustments of length. Bulldog grips are not intended for mine hoisting ropes nor for the permanent attachment of crane ropes in rope transmission.

Care and discretion in application are needed to ensure that the actual breaking force of the rope secured by bulldog grips is not unduly impaired. When wrongly applied, with the bridges on the rope tail and the U-bolts on the main rope, the reduction in actual breaking force of the rope may be serious.

The bulldog grips are not generally recommended for wire ropes of size larger than 41 mm. For such sizes it is generally considered appropriate to use the 'double throat' type of grips when grips are called for.

Method of applying bulldog grips to the wire rope is explained in Annex B for the information of the manufacturer and the purchaser.

The composition of the committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the results of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

BULLDOG GRIPS — SPECIFICATION

(Third Revision)

1 SCOPE

This standard specifies material and dimensions for bulldog grips for wire ropes of nominal sizes from 8 to 41 mm diameter.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards given in Annex A.

3 MATERIAL

3.1 U-Bolts and Nuts

3.1.1 The U-bolts of bulldog grips shall be manufactured from steel of class 1A designation 15C8 of IS 1875.

3.1.2 The nuts shall be manufactured from material having mechanical properties corresponding to property Class 4 of IS 1367 (Part 6).

3.2 Bridges

The bridge shall be steel castings malleable iron casting spheroidal graphite castings or steel drop forgings. Steel casting shall comply with Grade 280-520N of IS 1030. Malleable iron casting shall conform to IS 14329. Spheroidal graphite casting shall comply with the requirement of Grade SG 450/10 or SG 400/15 of IS 1865. Steel drop forgings shall comply with the requirements of Class 2 of IS 2004.

4 FORM AND DIMENSIONS

4.1 Nominal Size

The nominal size of the grips shall be the diameter of the wire ropes for which they are suitable as given in Table 1. For wire ropes of intermediate sizes the next larger size of bulldog grips shall be employed.

4.2 The form and dimensions of the grips shall be in accordance with Table 1.

4.3 Tolerance on Dimensions

The dimensions given in Table 1 are minimum dimensions. The maximum dimensions shall not exceed the minimum values by five percent.

5 DESIGNATION

The designation of the bulldog grips shall include:

a) The method of manufacture — Forged (F) or Cast (C);
b) Galvanized (G) or Not Galvanized (NG);
c) The nominal diameter of the rope on which the grips are to be used; and
d) The specification number.

Example: A bulldog grip which is forged, galvanized by the hot-dip process and suitable for a wire rope of 20-mm diameter and conforming to IS 2361 shall be designated as:

Bulldog Grip F × G × 20 IS 2361

6 GENERAL REQUIREMENTS

6.1 Bridges

The channel holding the rope shall be smooth in the direction of the rope axis. All fins or flashes produced during manufacture shall be dressed to a level surface. The bolt holes in the bridges may be drilled or cored, and shall be a free fit to the parallel portions of the U-bolt. If drop-forged, the bridges shall be normalized at temperatures between 880°C and 910°C, followed by withdrawal from the surface and cooling in still air. It should be possible for the bridges to move as close as possible to the U-portion of the bolt as 1.5 times the nominal diameter of the ropes to be gripped. The bridges shall be suitably scored to suit a round strand rope of right-hand lay having six strands.

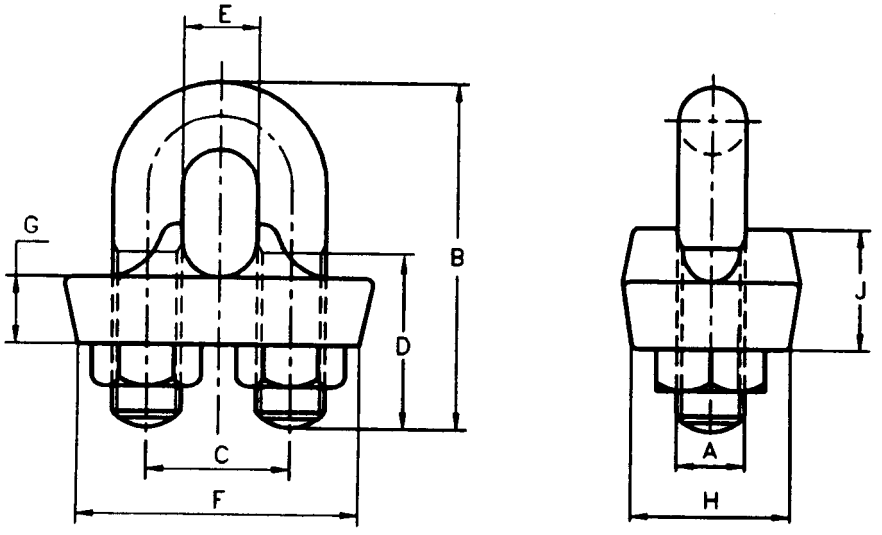
NOTE — If grooves are required for use with a rope of different construction other than specified above full particulars to the number and shape of the strands and the direction and length of lay of the rope should be stated in an enquiry and order.

6.2 U-Bolts

The U-bolts shall be formed from the straight bar either by bending when at a uniform red heat, or by bending the bar cold. After bending the U-bolt shall be normalized at a temperature between 880°C and 910°C followed by withdrawal from the furnace and cooling in still air.

Table 1 Dimensions of Bulldog Grips

(*Clauses* 4.1, 4.2 *and* 4.3)



All dimensions in millimetres.

Nominal Size (Dia of Rope) *d*	*A*	*B* (3*A* + 2 *d*)	*C* (*E* + *A*)	*D* (2*A* + 0.6 *d*)	*E* (1.075 *d*)	*F* (*C* + 2 *A*)	*G* (*A*)	*H* (2.3 *A*)	*J* (Approx 1.8 *A*)
8	M8	40	17	21	9	33	8	18	14
9	M10	50	21	26	11	41	10	21	18
10	M10	50	21	26	11	41	10	23	18
11	M12	60	25	31	13	49	12	28	22
12	M12	60	25	31	13	49	12	28	22
13	M12	64	27	32	15	51	12	28	22
14	M12	64	27	32	15	51	12	28	22
16	M14	74	31	38	17	59	14	32	25
18	M14	82	36	40	22	64	14	32	25
19	M14	82	36	40	22	64	14	32	25
20	M14	82	36	40	22	64	14	32	25
22	M16	92	40	45	24	72	16	37	29
24	M20	110	47	55	27	87	20	46	36
26	M20	118	51	57	31	91	20	46	36
28	M20	118	51	57	31	91	20	46	36
32	M20	124	54	59	34	94	20	46	36
35	M22	136	60	65	38	104	22	51	40
36	M22	142	63	67	41	107	22	51	40
38	M22	142	63	67	41	107	22	51	40
41	M23	157	69	75	44	119	25	58	45

6.3 Nuts

The nuts shall be hexagonal nuts complying with the requirements of IS 1364 (Part 3). Other types of nuts (heavier nuts, lock nuts, etc) may be supplied by agreement between the purchaser and the manufacturer

6.4 Screw Threads

6.4.1 Screw threads for U-bolts and nuts shall (after galvanizing when specified) conform to the coarse class of IS 4218 (Part 6).

6.4.2 It is recommended that the screw threads should be gauged in accordance with the system specified in IS 2334.

6.5 Workmanship

The bridges of the grips shall be neatly forged or cast, the U-bolts neatly formed, and the grips shall be free from roughness or sharp edges liable to injure the wire ropes.

6.6 Freedom from Defects

Each bulldog grip shall be carefully examined by a competent person and shall be deemed to comply with this standard only if found free from flaw or defect.

6.7 Conditions and Galvanizing

Unless otherwise specified by the purchaser, the grips shall be supplied in assembled condition, free from rust, with U-bolt, threads oiled with nondrying lubricating oil, but otherwise without coating of any kind. When specified by the purchaser, the grips shall be galvanized by the hot-dip process as per IS 2629. Zinc containing at least 98.5 percent shall be used for the purpose of galvanizing.

7 TEST FOR GALVANIZING

7.1 When specified by the purchaser samples of bulldog grips shall be tested in accordance with IS 2633.

7.1.1 The purchaser shall state clearly at the time of the enquiry and order whether he requires the zinc coating to be tested, the number of samples he requires to be tested and the number of dips the sample has to be subjected to.

NOTE — It is recommended that not more than one sample per consignment of each size of bulldog grip shall normally be subjected to this test.

8 INSPECTION

8.1 The representative of the purchaser shall have free access to the works of the manufacturer at all reasonable times; he shall be at liberty to inspect the manufacture of the bulldog grips at any stage.

8.2 When so specified in the enquiry and order the manufacturer shall furnish proof to the purchaser that the material used in the manufacture of bulldog grips supplied complies with the requirements of **3**.

9 SAMPLING

Unless otherwise agreed to between the supplier and the purchaser, the sampling as given in IS 1367 (Part 17) shall be followed.

10 MARKING

10.1 The bulldog grips shall be legibly marked with the nominal size and indication of the source of manufacture.

10.2 BIS Certification Marking

10.2.1 The product may also be marked with BIS Standard Mark.

10.2.2 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and Rules and Regulations made thereunder. The details of conditions under which a licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
1030 : 1998	Carbon steel castings for general engineering purposes (*fifth revision*)
1364 (Part 3) : 1992	Hexagon head bolts, screws and nuts of product grades A and B: Part 3 Hexagon nuts (size range M 1.6 to M 64) (*third revision*)
1367 (Part 6) : 1994	Technical supply conditions for threaded steel fasteners : Part 6 Mechanical properties and test methods for nuts with specified proof loads (*third revision*)
(Part 17) : 1996	Industrial fasteners – Threaded steel fasteners —Technical supply conditions : Part 17 Inspection, sampling and acceptance procedure (*third revision*)
1865 : 1991	Iron castings with spheroidal or nodular graphite (*third revision*)
1875 : 1992	Carbon steel billets, blooms, slabs and bars for forgings — Specification (*fifth revision*)

IS No.	*Title*	*IS No.*	*Title*
2004 : 1991	Carbon steel forgings for general engineering purposes (*third revision*)		coating of zinc coated articles (*second revision*)
2334 : 1975	Gauging practice for ISO metric screw threads (*first revision*)	4218 (Part 6) : 1978	ISO metric screw threads : Part 6 Limits of sizes for commercial bolts and nuts (diameter range 1 to 52 mm) (*first revision*)
2629 : 1985	Recommended practice for hot-dip galvanizing on iron and steel (*first revision*)	14329 : 1995	Malleable iron castings
2633 : 1986	Methods for testing uniformity of		

ANNEX B

(Foreword)

METHOD OF APPLICATION OF BULLDOG GRIPS TO WIRE ROPE

A-1 The bulldog grips shall be fitted to wire ropes as shown in Fig. 1 and not as shown in Fig. 2. The bridge of the grip should invariably be fitted on the working part of the rope and the U-bolt on the rope tail or dead end of the rope. Grips should not be placed alternately in position on the rope.

A-2 It is recommended that the following minimum number of bulldog grips be fitted at each connection:

Diameter of Wire Rope mm	*Minimum Number of Grips*
Up to and including 20	3
Over 20, up to and including 32	4
Over 32, up to and including 38	5
For 41	6

A-3 Bulldog grips should be spaced at a distance of approximately six times the rope diameters.

A-4 The efficiency of wire rope termination made with bulldog grips depends entirely upon their correct placement on the rope and the care and skill in fitting and screwing up of the grips. If properly made with the number of grips and spacing as recommended, and all the grips placed with their bridges on the long part of the rope and the U-bolt bearing on the short or tail end of the rope such a terminal would be expected to hold up to 85 to 90 percent of the actual breaking force of the rope.

A-5 A terminal made with bulldog grips should always be inspected after the application of one or two initial loadings. In most of the cases it is to be found that the nuts require further adjustment. With improperly tightened nuts or with fewer grips than the number recommended, the rope end may draw through the grips at the early stage of the loading. The grips farthest from the eye or thimble should not be very severely screwed up as that is the most vulnerable section in this form of assembly. Serving both the parts of rope with soft zinc coated wire at the position where the grips are applied (so that the grips seat well on serving) will help to increase the efficiency of the connection.

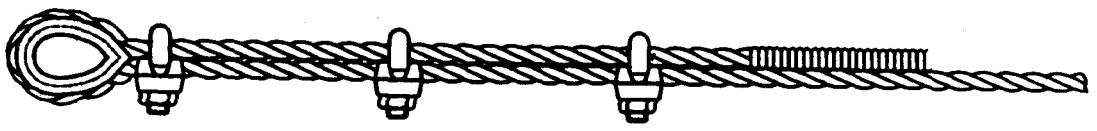


FIG. 1 RIGHT WAY OF APPLYING BULLDOG GRIPS

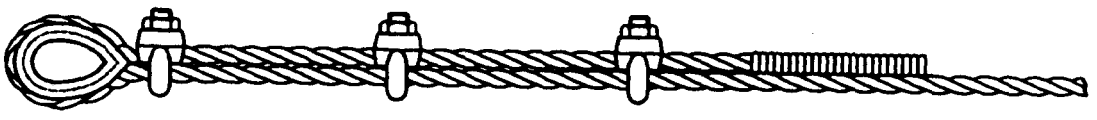


FIG. 2 WRONG WAY OF APPLYING BULLDOG GRIPS

ANNEX C

(Foreword)

COMMITTEE COMPOSITION

Wire Ropes and Wire Products Sectional Committee, ME 10

Organization	*Representative(s)*
Directorate General of Mines Safety, Dhanbad	SHRI D. SAHA (***Chairman***) SHRI S. P. BANSAL (*Alternate*)
Aerial Ropeway & Mechanical Handling Co Pvt Ltd, Kolkata	SHRI A. K. KINRA SHRI RANJAN MUKHERJEE (*Alternate*)
Amar Promoters Pvt Ltd, Solan	SHRI VIRENDER AGARWAL SHRI JATINDER AGARWAL (*Alternate*)
Bharat Coking Coal Ltd, Dhanbad	SHRI R. K. PRASAD
Bharat Wire Ropes Ltd, Mumbai	SHRI D. M. SHAH
Central Mining Research Institute, Dhanbad	SHRI S. P. CHAUDHARY SHRI R. P. CHAKRABORTY (*Alternate*)
Directorate General of Aeronautical Quality Assurance, New Delhi	SHRI S. B. PRASAD SHRI SANJAY CHAWLA (*Alternate*)
Directorate General of Civil Aviation, New Delhi	SHRI R. C. GUPTA SHRI. M. M. KAUSHAL (*Alternate*)
Eastern Coalfields Ltd, Kolkata	SHRI H. K. CHAKRABORTY
Fort William Industries Ltd, Hooghly	SHRI J. L. RATHI SHRI BASUDEB BANERJEE (*Alternate*)
JCT Ltd (Steel Division), Hoshiarpur	SHRI S. K. SETHI SHRI M. L. SHARMA (*Alternate*)
Ministry of Defence (Naval), New Delhi	CDR BRAHMASWAROOP SHRI. B. L. KHDWAL (*Alternate*)
Ministry of Surface Transport, New Delhi	SHRI G. P. ROY SHRI T. K. DUTTA (*Alternate*)
National Test House, Gaziabad	SHRI D. S. MAJUMDAR SHRI B. N. SARKAR (*Alternate*)
North Eastern Coalfields Ltd, Kolkata	SHRI A. TIRKEY
Oil and Natural Gas Commission, Dehra Dun	SHRI R. K. GARG SHRI P. K. SOOD (*Alternate*)
Research Designs & Standards Organization, Lucknow	DEPUTY DIRECTOR (Standards)
South Eastern Coalfields Ltd, Bilaspur	SHRI S. K. MISHRA SHRI G. RAMASWAMI (*Alternate*)
Usha Breco Ltd, Kolkata	SHRI AMIT KUMAR BASU SHRI C. K. KARMAKAR (*Alternate*)
Usha Martin Industries Ltd, Ranchi	SHRI RANA PRATAP SHRI K. K. SENGUPTA (*Alternate*)
Vidarbha Hardware Industries, Akola	SHRI O. P. DALMIA SHRI SANJAY K. DALMIA (*Alternate*)
BIS Directorate General	SHRI M. L. CHOPRA, Director & Head (MED) [Representing Director General (*Ex-officio*)]

Member-Secretary
SHRI P. VENKATESWARA RAO
Joint Director (MED), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No. ME 10 (619).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	323 76 17 323 38 41
Eastern	: 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700 054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160 022	60 38 43 60 20 25
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600 113	254 12 16, 254 14 42 254 25 19, 254 13 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400 093	832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM

Reprography Unit, BIS, New Delhi, India