

International Standard



5612

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Mining — Scraper bars for chain conveyors

Exploitation minière — Raclettes pour convoyeurs à chaînes

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Descriptors : mining equipment, chain conveyors, scrapers, specifications, dimensions, tests, marking.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5612 was developed by Technical Committee ISO/TC 82, *Mining*, and was circulated to the member bodies in October 1982.

It has been approved by the member bodies of the following countries:

Australia	Czechoslovakia	Mexico
Austria	Egypt, Arab Rep. of	Poland
Belgium	France	Romania
Brazil	Germany, F.R.	Spain
Bulgaria	India	United Kingdom
China	Korea, Dem. P. Rep. of	USSR

No member body expressed disapproval of the document.

Mining — Scraper bars for chain conveyors

1 Scope and field of application

This International Standard specifies the requirements for a range of scraper bars for use in twin outboard chain assemblies made from chains complying with ISO 610 and associated shackle type connectors complying with ISO 1082. The range of scraper bars specified is intended for use with chains of diameter 14, 18, 22, 24 and 26 mm in a selected range of chain centres and is clamped tight within the shackle type connectors.

This International Standard is not intended to indicate a complete design, but gives sufficient detail to ensure dimensional compatibility with the associated chains and connectors. Dimensions of section ends of the scraper bars necessary for compatibility between scraper bars and connectors are specified. The centre sections of the scraper bars may be of any design and shape, within the range of dimensions given in table 1 for the appropriate chain centres. Other dimensions may be subject to national standards or agreement between the purchaser and the manufacturer.

As a guide to the selection of scraper bars for specific applications, scraper bars are rated by determining the force at which a specified minimum deflection is attained, when the bar is subjected to a three-point bend test. The bars can be classified as "light", "medium" or "heavy", according to their strength ratings.

2 References

ISO/R 147, *Load calibration of testing machines for tensile testing of steel*.

ISO 610, *High-tensile steel chains (round link) for chain conveyors and coal ploughs*.

ISO 1082, *Mining — Shackle type connector units for chain conveyors*.

3 Definitions

For the purpose of this International Standard, the following definitions apply.

3.1 twin outboard chain assembly: Pairs of chains to which scraper bars are coupled by means of shackle type connectors.

3.2 nominal chain centres: The distance between the centres of the chains in the assembly.

3.3 force-deflection test: A test to determine the ability of a scraper bar to sustain a minimum deflection and the strength rating.

3.4 minimum deflection: The deflection that a scraper bar is required to sustain without fracture.

3.5 strength rating: The force required to produce a central deflection in the scraper bar, equal to 10 % of the nominal chain centres of the assembly.

3.6 inspector: The representative of the purchaser.

4 Material

It shall be the responsibility of the manufacturer to select the steel so that the finished scraper bars, suitably heat-treated, where appropriate, meet the specified mechanical properties.

5 Heat treatment

Any heat treatment shall be the responsibility of the manufacturer.

6 Dimensions

Scraper bars shall comply with the dimensions specified in table 1 and illustrated in figures 1 and 2. The centre sections of the scraper bars may be of any design and shape, within the range of dimensions given in table 1 for the appropriate chain centres.

All other dimensions shall be chosen to ensure compatibility with other associated equipment, i.e. connector, sprocket, conveyor pans, drives etc.

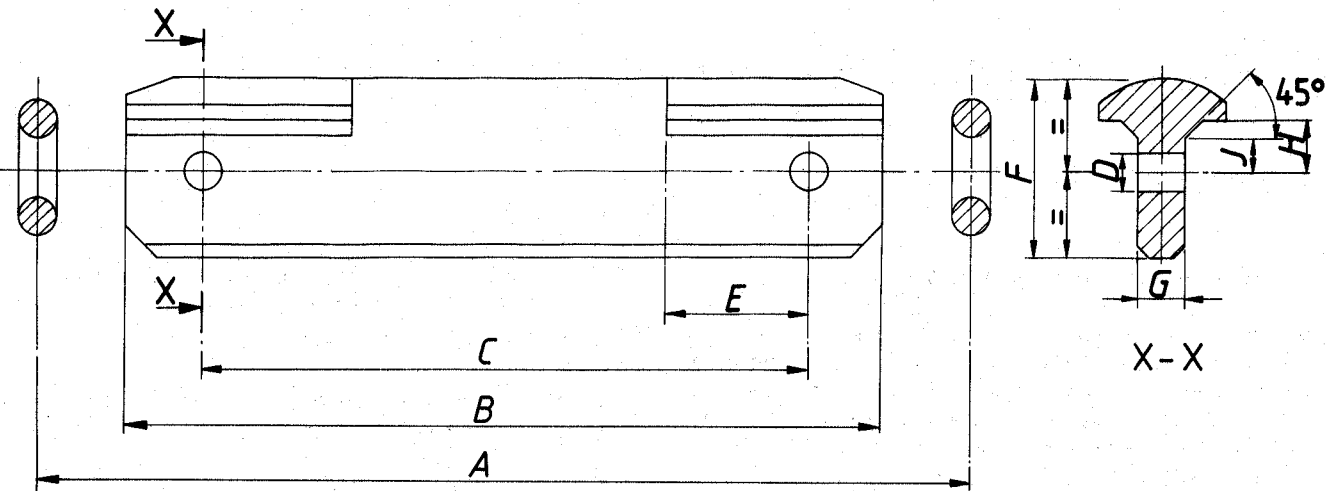


Figure 1 — Dimensions of "T" scraper bars

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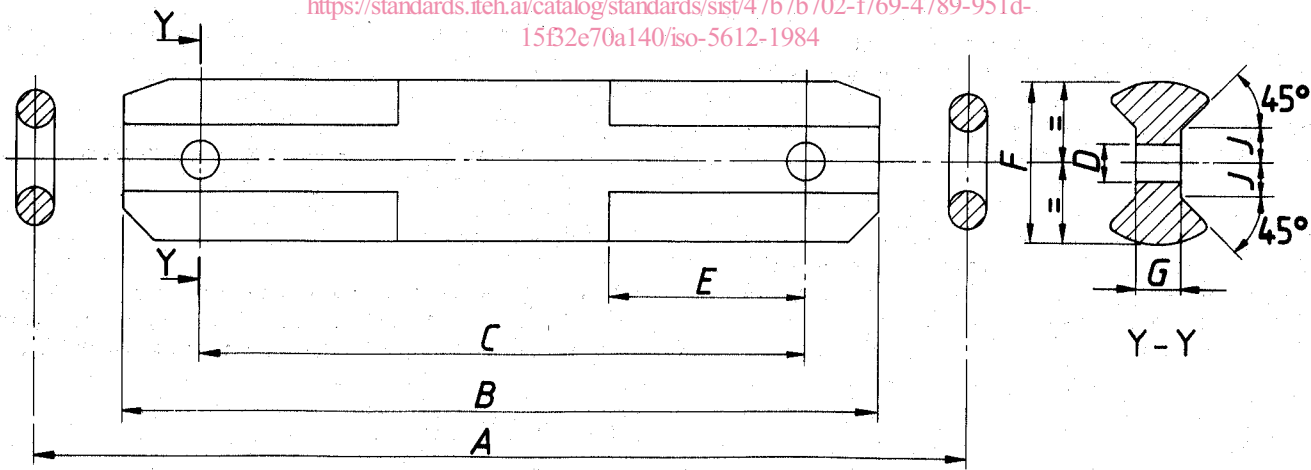


Figure 2 — Dimensions of "I" scraper bars

NOTE — Ends of bars should be suitably relieved by chamfer or other means to avoid interference with sprockets.

Table 1 — Dimensions of scraper bars

Nominal size and pitch of chain	Nominal chain centres <i>A</i>	Overall length of bar <i>B</i>		Hole centres <i>C</i>		Hole diameter <i>D</i>		Lateral clearance "T" bar <i>E</i>		Height of bar <i>F</i>	Web thickness "T" bar <i>G</i>			Vertical clearance <i>H</i>		Location of chamfer "T" bar <i>J</i>	
		max.	min.	max.	min.	max.	min.	"T" bar min.	"I" bar min.	max.	max.	min.	max.	max.	min.	min.	max.
14 × 50	350	302	298	248,5	247,5	17,5	17	19	54	52	17,5	16	12,5	16,5	16	12	9
	400	352	348	298,5	297,5												
	500	452	448	398,5	397,5												
18 × 64	400	342	338	290,5	289,5												
	500	442	438	390,5	389,5												
	600	542	538	490,5	489,5	21,5	21	42	61	64	20,5	19	16	22	21,5	15,5	12,5
	650	592	588	540,5	539,5												
	700	642	638	590,5	589,5												
22 × 86	450	362	358	300,5	299,5												
	500	412	408	350,5	349,5												
	600	512	508	450,5	449,5	25,5	25	46	90	81	24,5	23	20,5	26,5	26	18	15
	650	562	558	500,5	499,5												
	700	612	608	550,5	549,5												
	750	662	658	600,5	599,5												
24 × 86	600	512	508	444,5	443,5	25,5	25	—	90	88	—	—	23	—	—	—	15
24 × 87,5	600	512	508	444,5	443,5	25,5	25	—	90	88	—	—	23	—	—	—	15
26 × 92	500	402	398	330,5	329,5												
	600	502	498	430,5	429,5												
	650	552	548	480,5	479,5	28,5	28	46	—	95	28	26,5	—	29,5	29	18,5	—
	700	602	598	530,5	529,5												
	800	702	698	630,5	629,5												

Dimensions in millimetres

7 Sampling and testing

7.1 General

All test data shall be recorded. The testing procedure shall be as follows.

7.2 Selection of samples

Unless otherwise specified by the purchaser, the following sampling arrangements shall apply, but this shall not preclude the inspector asking for such further samples as he may deem necessary:

- a) test samples shall be selected at random; they shall be in the same condition as the bulk of the scraper bars, and free from any coating which might obscure defects;
- b) for sampling purposes, the scraper bars shall be divided into lots, a lot comprising 500 scraper bars; any fraction shall be considered as a complete lot;
- c) for dimensional tests, four samples shall be taken from each lot;
- d) for the force-deflection test, one sample shall be taken from each lot.

7.3 Dimensional tests

The dimensions required by clause 6 shall be verified.

7.4 Force-deflection test

7.4.1 Testing machine

The testing machine and loading arrangements used shall be suitable for meeting the requirements of the test procedure. The type and accuracy of the testing machine shall be in accordance with class 1 of ISO/R 147 or an equivalent national standard. The testing machine shall be used only within the appropriate range as shown by the test certificate for the machine.

7.4.2 Procedure

Position the bar with the connector bolt holes lying in the vertical plane and simply supported at the appropriate bolt hole centres.

Apply a test force at the mid-point of the span, using appropriately shaped supports and loading pad, rounded on the contact surfaces to a radius of 25 mm.

Carry out the test in a single loading in which the force is gradually increased until the specified central deflection is reached (i.e. equal to 10 % of the chain centres). Read the force from the testing machine indicator and classify the bar as "light", "medium", or "heavy" in accordance with the strength ratings given in table 2. Each bar tested shall reach the specified minimum deflection with no visible sign of fracture.

For classification into a given category, the force reached at the specified minimum deflection shall be at least equal to the appropriate value specified in table 2, for each class.

8 Inspection procedure

8.1 Acceptance

A scraper bar lot shall be deemed to comply with this International Standard if each of the samples taken from a lot fulfils all the specified test requirements.

Should any of the samples fail to meet any one of the specified tests, two further samples shall be selected from the same lot. If both these additional samples meet the specified test requirements, the lot shall be deemed to comply with this International Standard. Should either of the two further samples fail any one of the specified tests, the lot shall be rejected.

8.2 Marking

8.2.1 Identification marking

All finished scraper bars shall be legibly marked to indicate the manufacturer and, by agreement between the purchaser and the manufacturer, any other relevant information.

8.2.2 Inspection marking

Provided all specified tests are satisfactory and a lot has been accepted, the inspector shall signify his acceptance. The precise extent and nature of the inspection marking to be used shall be subject to agreement between the purchaser and the manufacturer.

8.3 Test certificate

At the option of the purchaser, the manufacturer shall supply a representative certificate(s) of test and examination with every consignment of scraper bars supplied as conforming to this International Standard; when so agreed between the purchaser and the manufacturer, identification of the cast number of the steel shall be stated. This shall also apply in instances where scraper bars are supplied as part of a complete conveyor chain assembly.

The certificate shall be signed by the manufacturer and by the inspector if he witnessed the inspection tests.

8.4 General inspection

For the purpose of witnessing the tests and inspecting the testing machines and methods of examination, the inspector shall be given access to the relevant parts of the works of the manufacturer at all reasonable times.

Table 2 — Strength rating of scraper bars —
Minimum force ¹⁾

Nominal size and pitch of chain mm	Strength rating		
	Light	Medium	Heavy
	Minimum force, kN		
14 × 50	35	75	150
18 × 64	60	125	250
22 × 86	90	185	370
24 × 86	105	215	430
24 × 87,5	105	215	430
26 × 92	125	255	510

1) These values approximate to 7,5 % (light), 15 % (medium) and 30 % (heavy) of the gross chain strength, i.e. twice the minimum breaking force for grade C chain as specified in ISO 610.

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