
International Standard



3056

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Non-calibrated round steel link lifting chain and chain slings — Use and maintenance

Chaînes de levage non calibrées en acier rond et élingues à chaînes — Utilisation et entretien

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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 preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 3056 was prepared by Technical Committee ISO/TC 111, *Round steel link chains, lifting hooks and accessories*.

This second edition cancels and replaces the first edition (ISO 3056-1974), of which it constitutes a technical revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Non-calibrated round steel link lifting chain and chain slings — Use and maintenance

1 Scope and field of application

This International Standard constitutes a guide to the selection, use, inspection, testing, maintenance and repair of non-calibrated, round steel, short link chains and chain slings, manufactured in accordance with ISO 1834, ISO 1835, ISO 3075, ISO 3076, ISO 4778 and ISO 7593.

NOTE — Lifting chains and chain slings may be governed by national and local laws and regulations.

2 References

ISO 1834, *Short link chain for lifting purposes — General conditions of acceptance.*

ISO 1835, *Short link chain for lifting purposes — Grade M(4), non-calibrated, for chain slings, etc.*

ISO 3075, *Short link chain for lifting purposes — Grade S(6), non-calibrated, for chain slings, etc.*

ISO 3076, *Short link chain for lifting purposes — Grade T(8), non-calibrated, for chain slings, etc.*

ISO 4778, *Chain slings of welded construction — Grade M(4), S(6) and T(8).*

ISO 7593, *Chain slings assembled by methods other than welding — Grade T(8).*

ISO 8539, *Forged steel lifting components for use with grade T(8) chain.*

3 Definitions

3.1 working load limit (WLL): The maximum mass which a sling is designed to sustain in general service.

3.2 working load (WL): The maximum mass which a sling should be used to sustain in a particular stated service.

3.3 competent person: A designated person, qualified by knowledge and practical experience, and with the necessary instructions to enable the required examinations to be carried out. (See clause 6.)

3.4 frequent inspection: Regular visual inspection by the operator or other designated personnel.

3.5 periodic inspection: Thorough examination by a competent person, of which records should be made to provide the basis for a continuing evaluation.

4 Chain sling selection

4.1 General

The principles outlined in 4.2 to 4.4 relate to the selection of slings for general purpose use, i.e. slings having branches of equal nominal reach.

4.2 Working load

The working load of the sling selected shall be at least equal to the maximum load to be lifted. This working load will be the same as the working load limit (WLL) in normal circumstances or less than the working load limit under certain conditions.

4.3 Working load limit

4.3.1 General

The working load limit is marked on the sling and is determined by

- the size and grade of chain selected (see 4.3.2);
- the geometry of the sling (see 4.3.3);
- the method of rating (see 4.3.4).

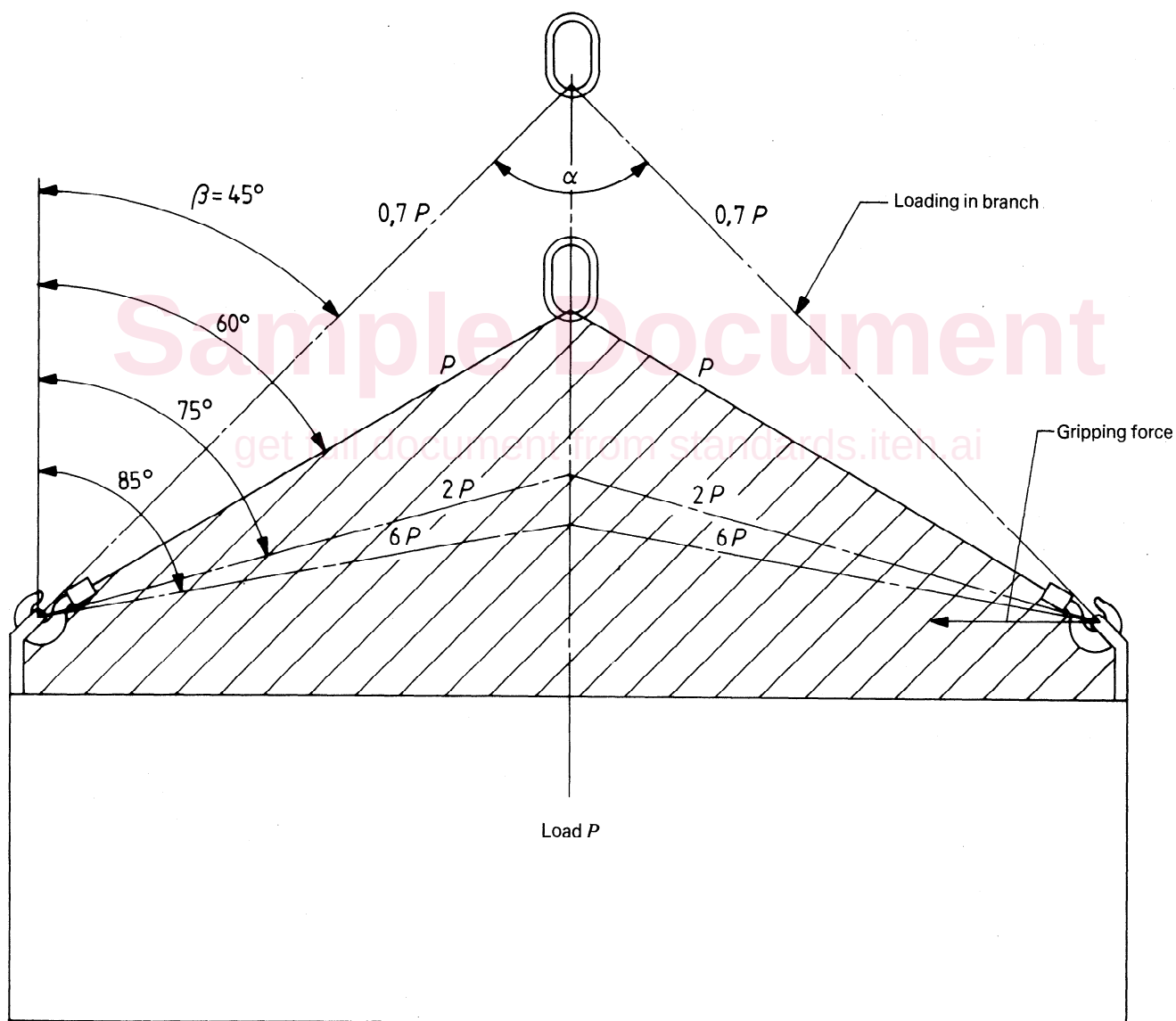
4.3.2 Size and grade of chain selected (see table 1)

It will be noted that as the grade of chain selected increases from M to S to T, chain slings of progressively smaller nominal size can be used to achieve equivalent strength, e.g. a grade T sling will have twice the working load limit of a grade M sling of the same size.

4.3.3 Geometry of the sling

By geometry of the sling is meant the number of chain branches

and, in the case of multi-branch slings, the included angle between them or the angle to the vertical. Included angles or angles to the vertical should be assessed as described in ISO 4778 and as illustrated in table 2. The greater the included angle between branches, the lower the load a particular sling can carry without exceeding the permissible loading in the branches (see figure 1). Each situation should be checked to ensure that the permissible loading in any branch is not exceeded. The use of sling branches at angles greater than 60° to the vertical (included angles of greater than 120° for two- or four-branch slings) is not recommended.



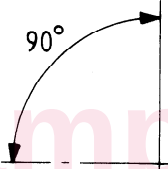
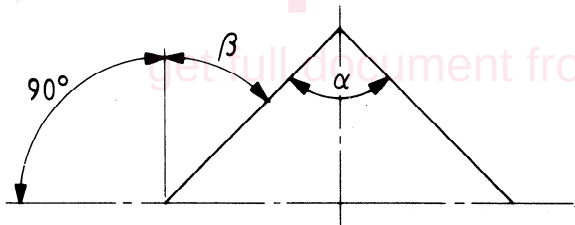
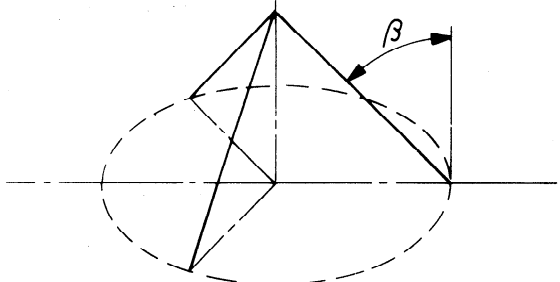
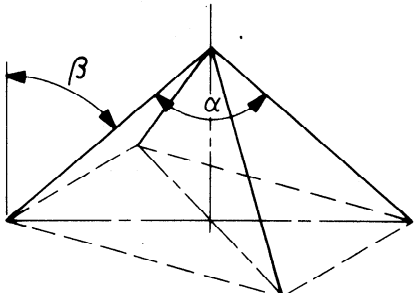
The hatched area indicates included angles between branches of greater than 120° (60° to the vertical) at which angles slings should not be used.

Figure 1 — Variation of sling branch loading with branch angle for a given load P

Table 1 — Grades of short link chain designed for use in chain slings

Grade	Relevant ISO International Standard	Mean stress at working load limit (WLL)	Mean stress at proof force (F_p)	Mean stress at minimum breaking force (F_m)	Ratio $F_m : \text{WLL}$
		MPa (N/mm ²)	MPa (N/mm ²)	MPa (N/mm ²)	
M(4)	ISO 1835	100	200	400	4:1
S(6)	ISO 3075	157,5	315	630	4:1
T(8)	ISO 3076	200	400	800	4:1

Table 2 — Factors for working load limits calculated using uniform load method

Slings	Number of branches	Angle of inclination α	Angle to the vertical β	Factor for WLL
	1	—	—	1
	2	0° to 90°	0° to 45°	1,4
		90° to 120°	45° to 60°	1
	3	—	0° to 45°	2,1
		—	45° to 60°	1,5
	4	0° to 90°	0° to 45°	2,1
		90° to 120°	45° to 60°	1,5