
International Standard



6805

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Rubber hoses and hose assemblies for underground mining — Wire reinforced hydraulic type for coal mining

Tuyaux et flexibles en caoutchouc pour l'exploitation minière — Type hydraulique avec armature de fils métalliques pour mines de charbon

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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 6805 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

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Rubber hoses and hose assemblies for underground mining — Wire reinforced hydraulic type for coal mining

1 Scope and field of application

1.1 This International Standard specifies requirements for embedded wire hose of internal diameter from 5 to 51 mm for use with common hydraulic fluids such as mineral oils, soluble oils, oil and water emulsions, aqueous glycol solution, and water at temperatures ranging from -40 to $+100$ °C. Operation at the extremes of or outside this temperature range may materially reduce the life of the hose. The hose is not suitable for use with fluids having a castor oil or ester base. The hose shall be antistatic and fire resistant.¹⁾

1.2 Three types of hose are specified:

Type 1 — This is a 2 steel wire braid hose dimensionally and constructionally in line with ISO 1436. For coal mining applications the performance requirements are in excess of those specified in ISO 1436.

Type 2 — This is a 2 steel wire braid hose which is typical of that at present in use in many very severe static or semi-static applications in coal mining installations. The dimensional parameters have been selected to provide increased reliability. The performance requirements reflect the higher design working pressure ratings of this hose.

Type 3 — This is a 4 steel wire spiral hose dimensionally and constructionally in line with ISO 3862. For coal mining applications the performance requirements are in excess of those specified in ISO 3862.

Types 1 and 2 represent two significantly different types of application of wire braided hose for hydraulic equipment used in the coal mining industry. Types 1 and 3 reflect normal hydraulic usage everywhere in conditions where the circuit experiences the full continuous dynamic impulses of the pump.

Hydraulic hoses for use with static or semi-static applications represent the major proportion of all hoses used in deep mines. The specific requirements of type 2 provide the most economic technical solution in such cases.

Where the values for type 2 in tables 1 to 6 differ from those of type 1, they have evolved in response to the needs of roof

support equipment design as part of a programme of research and development.

1.3 This International Standard does not include requirements for end-fittings. It is limited to the performance of hoses and hose assemblies.

2 References

ISO 1307, *Rubber hose — Bore diameters and tolerances on length.*

ISO 1402, *Rubber hose — Hydrostatic testing.*

ISO 1436, *Rubber products — Hoses and hose assemblies — Wire reinforced hydraulic type.*

ISO 1817, *Rubber, vulcanized — Determination of the effect of liquids.*

ISO 3862, *Rubber hoses and hose assemblies — Rubber-covered, spiral wire reinforced, hydraulic type.*

ISO 4672, *Rubber products — Hoses — Low temperature flexibility tests.*

ISO 6803, *Rubber and plastics hoses and hose assemblies — Wire reinforced — Hydraulic impulse test without flexing.*

ISO 6945, *Rubber hoses — Determination of abrasion resistance of the outer cover.*

ISO 7326, *Rubber and plastics hoses — Assessment of ozone under static conditions.*

ISO 8030, *Rubber and plastics hoses — Underground mining — Method of test for flammability.²⁾*

ISO 8031, *Rubber and plastics hoses — Determination of electrical properties.²⁾*

ISO 8033, *Rubber and plastics hoses — Determination of adhesion between components.²⁾*

1) Suitable tests will form the subjects of future International Standards.

2) At present at the stage of draft.

3 Materials and construction

3.1 The hose shall consist of an oil and water resistant synthetic rubber lining, steel wire reinforcement, of either type described in 1.2 and an oil, water, weather and abrasion resistant synthetic rubber cover. A ply or braid of suitable textile material may be used over the lining and/or the wire reinforcement to anchor the synthetic rubber to the wire. Each braid or spiral wire layer shall be separated by an insulating layer of rubber.

3.2 The hose shall be concentric in accordance with the requirements of table 1.

NOTE — ISO 1307 has not been followed for nominal bore or permitted range. The dimensions adopted in table 1 are in accordance with those specified by the Society of Automotive Engineers (USA), and are in wide use in numerous countries throughout the world.

Table 1 — Hose concentricity

Values in millimetres

Nominal bore	Maximum variation from concentricity			
	Internal diameter to overall diameter		Internal diameter to reinforcement diameter	
	Types 1 and 3	Type 2	Types 1 and 3	Type 2
Up to and including 6,3	0,8	0,5	0,5	0,5
Over 6,3 up to and including 19	1,0	0,7	0,7	0,7
Over 19	1,3	1,0	0,9	1,0

4 Dimensions

The bore diameter, diameter over reinforcement, and outside diameter of finished hose shall meet the requirements of tables 2 to 4.

Table 2 — Hose dimensions — Type 1

Dimensions in millimetres

Nominal bore	Bore diameter		Diameter over outer wire braid		Outside diameter of finished hose	
	min.	max.	min.	max.	min.	max.
5	4,5	5,4	10,6	11,7	15,1	16,7
6,3	6,1	6,9	12,1	13,3	16,7	18,3
10	9,3	10,1	16,1	17,3	20,6	22,2
12,5	12,3	13,5	19,1	20,6	23,8	25,4
16	15,4	16,7	22,2	23,8	27,0	28,6
19	18,6	19,8	26,2	27,8	31,0	32,5
25	25,0	26,4	34,1	35,7	38,5	40,9
31,5	31,3	33,0	43,3	45,6	49,2	52,4
38	37,7	39,3	49,6	52,0	55,6	58,7
51	50,4	52,0	62,3	64,7	68,3	71,4

Table 3 — Hose dimensions — Type 2

Dimensions in millimetres

Nominal bore	Bore diameter		Diameter over outer wire braid		Outside diameter of finished hose	
	min.	max.	min.	max.	min.	max.
5	—	—	—	—	—	—
6,3	6,1	6,6	12,3	13,1	16,4	17,7
10	9,3	9,8	16,1	17,2	20,8	22,1
12,5	12,4	13,0	20,6	21,6	25,8	27,1
16	15,6	16,1	24,0	25,0	29,2	30,5
19	18,8	19,3	27,8	28,8	33,0	34,3
25	25,0	25,8	34,7	36,0	39,9	41,4
31,5	31,4	32,1	40,8	42,0	46,7	48,3
38	37,9	39,2	47,4	48,7	53,3	54,9
51	—	—	—	—	—	—

Table 4 — Hose dimensions — Type 3

Dimensions in millimetres

Nominal bore	Bore diameter		Diameter over outer wire braid		Outside diameter of finished hose	
	min.	max.	min.	max.	min.	max.
5	—	—	—	—	—	—
6,3	6,2	7,0	14,1	15,3	17,1	18,7
10	9,3	10,1	16,9	18,1	20,6	22,2
12,5	12,3	13,5	19,4	21,0	23,8	25,4
16	15,5	16,7	23,0	24,6	27,4	29,0
19	18,6	19,8	27,4	29,0	31,4	33,0
25	25,0	26,4	34,5	36,1	38,5	40,9
31,5	31,4	33,0	44,8	47,2	49,1	52,3
38	37,7	39,3	51,2	53,6	55,5	58,7
51	50,4	52,0	64,7	67,1	69,0	72,2

5 Pressure ratings

5.1 The design working and burst pressure of the hoses shall comply with the requirements of tables 5 and 6.

Table 5 — Design working pressure

Nominal bore	Type 1		Type 2		Type 3	
	MPa ¹⁾	bar	MPa	bar	MPa	bar
5	41,5	415	—	—	—	—
6,3	40,0	400	45,0	450	45,0	450
10	33,0	330	38,0	380	44,5	445
12,5	27,5	275	31,0	310	41,5	415
16	25,0	250	28,0	280	35,0	350
19	21,5	215	24,0	240	35,0	350
25	16,5	165	21,0	210	28,0	280
31,5	12,5	125	17,0	170	21,0	210
38	9,0	90	14,0	140	18,5	185
51	8,0	80	—	—	16,5	165

1) 1 MPa = 1 N/mm² = 10 bar