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AMENDMENT 1
1993-11-01

Isoprene rubber (IR) — Non-oil-extended, solution-polymerized types — Evaluation procedure

AMENDMENT 1

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[ISO 2303:1990/Amd 1:1993](#)

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Reference number
ISO 2303:1990/Amd.1:1993(E)

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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Amendment 1 to International Standard ISO 2303:1990 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 3, *Raw materials (including latex) for use in the rubber industry*.

<http://standards.itech.ai/catalog/standards/iso/faede69c-e80b-44f0-9697-fcfea59fb30/iso-2303-1990-amd-1-1993>

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Replace the text of 5.2 by the following text:

with the nip settings specified hereunder, small adjustments to the mill openings may be necessary.

5.2.2.1 Procedure A

	Duration (min)	Cumulative time (min)
a) Pass the rubber between the rolls twice without banding, with the mill opening set at 0,5 mm	approx. 2	
b) Weigh the rubber.		
c) Band the rubber with the mill opening set at 1,4 mm and make two 3/4 cuts from each side	2,0	2,0

NOTE 1 Some types of isoprene rubber go to the back roll, in which case the stearic acid should be added and after its incorporation the rubber can usually be transferred to the front roll. In addition, certain tougher types of isoprene rubber may require slightly longer breakdown before the addition of other materials in order to obtain a good rolling bank.

5.2 Procedure

[ISO 2303:1990/Amd 1:1993](https://standards.iteh.ai/catalog/standards/iso/faede69c-e80b-44f0-9697-fcfea59fb30/iso-2303-1990-and-1993)

5.2.1 Equipment and procedure

Equipment and procedure for the preparation, mixing and vulcanization shall be in accordance with ISO 2393.

5.2.2 Mill mixing procedures

Two mill mixing procedures are specified, A and B. The mixing time is shorter in method B.

The two methods will not necessarily give identical results. In laboratory cross checks or in a series of evaluations the same procedure shall be used in all cases.

In both methods the standard laboratory mill batch mass, in grams, shall be based on four times the formula mass. The surface temperature of the rolls shall be maintained at $70^{\circ}\text{C} \pm 5^{\circ}\text{C}$ throughout the mixing.

A good rolling bank at the nip of the rolls shall be maintained during mixing. If this is not obtained

d) Set the mill opening to 1,7 mm and add the stearic acid. Make one 3/4 cut from each side.....	2,0	4,0
e) Add the zinc oxide and the sulfur. Make one 3/4 cut from each side.....	3,0	7,0
f) Add the carbon black evenly across the mill at a uniform rate. When about half the black has been incorporated, open the mill to 1,9 mm and make one 3/4 cut from each side. Then add the remainder of the carbon black. Be certain to add the black that has dropped into the mill pan. When all the black has been incorporated, make one 3/4 cut from each side.....	13,0	20,0
g) Add the TBBS with the mill opening still at 1,9 mm. Make three 3/4 cuts from each side.....	3,0	23,0
h) Cut the batch from the mill. Set the mill opening to 0,8 mm and pass the rolled batch endwise through the rolls six times	3,0	26,0
Total time	26,0	
i) Sheet the batch to an approximate thickness of 6 mm and check-weigh the batch (see ISO 2393). If the mass of the batch differs from the theoretical value by more than 0,5 %, discard the batch and re-mix. Remove sufficient material for curemeter testing.		
j) Sheet the batch to approximately 2,2 mm for preparing test slabs or to the appropriate thickness for preparing ISO ring test pieces in accordance with ISO 37.		
k) Condition the batch for 2 h to 24 h after mixing and prior to vulcanizing, if possible at standard temperature and humidity as defined in ISO 471.		

5.2.2.2 Procedure B

	Duration (min)	Cumulative time (min)
a) Pass the rubber between the rolls twice without banding, with the mill opening set at $0,5 \text{ mm} \pm 0,1 \text{ mm}$. Then band the rubber between the rolls with the mill opening gradually increased to 1,4 mm.	2,0	2,0
b) Add the stearic acid. Make one 3/4 cut from each side.....	2,0	4,0
c) Add the sulfur and the zinc oxide. Make two 3/4 cuts from each side.....	3,0	7,0
d) Add half of the carbon black. Make two 3/4 cuts from each side.....	3,0	10,0
e) Add the remaining half of the carbon black and the black that has dropped into the mill pan. Make three 3/4 cuts from each side.....	5,0	15,0
f) Add the TBBS. Make three 3/4 cuts from each side.....	3,0	18,0
g) Cut the batch from the mill. Set the mill opening to $0,5 \text{ mm} \pm 0,1 \text{ mm}$ and pass the rolled batch endwise through the rolls six times	2,0	20,0
Total time	20,0	
h) Sheet the batch to approximately 2,2 mm for preparing test slabs or to the appropriate thickness for preparing ISO ring test pieces in accordance with ISO 37.		
i) Cut the batch from the mill and check-weigh the batch (see ISO 2393). If the mass of the batch differs from the theoretical value by more than 0,5 %, discard the batch and re-mix.		
j) Condition the batch for 2 h to 24 h after mixing and prior to vulcanizing, if possible at standard temperature and humidity as defined in ISO 471.		