

# INTERNATIONAL STANDARD

# ISO 2303

Third edition  
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**AMENDMENT 1**  
1993-11-01

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

### AMENDMENT 1

## iTeh STANDARD PREVIEW

*Caoutchouc isoprène (IR) — Types polymérisés en solution et non étendus à  
l'huile — Méthode d'évaluation*

AMENDEMENT 1/Amd 1:1993

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



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

## Foreword

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[ISO 2303:1990/Amd.1:1993](http://standards.iso.org/standards/info/tech/49/e80b-44f0-9697-6fa59f3075-2303-1990-amd-1-1993)

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*.

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

## AMENDMENT 1

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Replace the text of 5.2 by the following text: <https://standards.iteh.ai/catalog/standards/sist/faede69c-e80b-44f0-9697-fcfea59fb30/iso-2303-1990-amd-1-1993> with the nip settings specified hereunder, small adjustments to the mill openings may be necessary.

**5.2.2.1 Procedure A**

### 5.2 Procedure

#### 5.2.1 Equipment and procedure

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

a) Pass the rubber between the rolls twice without banding, with the mill opening set at 0,5 mm .....	approx. 2
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Duration (min)	Cumulative time (min)
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#### 5.2.2 Mill mixing procedures

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

b) Weigh the rubber.

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.

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
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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 °C ± 5 °C throughout the mixing.

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.

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
<b>Total time</b>	<b>26,0</b>	

- 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 mm ± 0,1 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 mm ± 0,1 mm and pass the rolled batch endwise through the rolls six times.....	2,0	20,0
<b>Total time</b>	<b>20,0</b>	

- 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.

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## 6 Evaluation of vulcanization characteristics with the oscillating disc curemeter

After "die temperature: 160 °C ± 0,3 °C", add

"(A temperature of 150 °C ± 0,3 °C may also be used)".

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## 8 Test report

Add the following two new paragraphs:

- "i) the mixing procedure used in 5.2.2;
- j) the die temperature used in clause 6 for the curemeter test."

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**Descriptors:** rubber, synthetic rubber, isoprene rubber, tests, physical tests, chemical tests, vulcanizing, test specimens, reference materials.

Price based on 3 pages

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