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(प्रथम पुनरीक्षण)

Indian Standard
RECLAIMED RUBBER — SPECIFICATION
(*First Revision*)

ICS 83.060

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BUREAU OF INDIAN STANDARDS
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Price Group 2

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Rubber Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

This standard was first published in 1974. Keeping in view the raw materials used and quality of reclaimed rubber, in this revision, reclaimed rubber have been classified into the following three classes:

- WTR-R — Whole tyre reclaimed rubber;
- TRR-N — Tube reclaimed rubber — Natural rubber
- TRR-I — Tube reclaimed rubber — Isobutylene isoprene rubber (Butyl Rubber)

In this revision, the requirements for Mooney viscosity (ML1+8) and chloroform extract have been added.

Reclaimed rubber is extensively used in the manufacture of many rubber goods both in tyre and non-tyre sectors except in some compounds for tyres. This reclaim is used either alone or in combination with natural and synthetic rubber or as blend of these polymers. Now-a-days butyl reclaim is also manufactured and used. Thus, reclaim rubber having different qualities are now available in the market for different applications.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
RECLAIMED RUBBER — SPECIFICATION
(First Revision)

1 SCOPE

This standard prescribes the requirements and method of sampling and test for three different classes of reclaimed rubber.

2 NORMATIVE REFERENCES

The following standards contain provisions which, through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1675 : 1971	Stearic acid, technical (<i>first revision</i>)
3399 : 1993	Zinc oxide for rubber industry (<i>second revision</i>)
5296 : 1979	Chloroform, pure and technical (<i>first revision</i>)
5599 : 1970	Methods for sampling of raw rubber
6306 : 1971	Methods of test for reclaimed rubber
6918 : 1972	Mercapto benzothiazole
8851 : 1994	Sulphur for rubber industry (<i>first revision</i>)
8979 : 1997	Tetramethyl thiuram disulphide (<i>second revision</i>)

3 CLASSES

3.1 The reclaimed rubber shall be classified as given below according to the raw material used and the quality of the reclaimed rubber:

<i>Classification</i>	<i>Abbreviated</i>	<i>Material</i>
Whole Tyre Rubber Reclaimed	WTR-R	Tyre rubber from automobiles such as truck, bus and passenger

<i>Classification</i>	<i>Abbreviated</i>	<i>Material</i>
		car, etc, or other equivalent rubbers
Tube Reclaimed Rubber	TRR-N	Rubber from tyre tubes principally made of natural rubber
Isobutylene-Isoprene Rubber	TRR-I	Rubber of tyre tubes principally made of isobutylene — isoprene rubber

4 REQUIREMENTS**4.1 Description**

The sheets or rods of the reclaimed rubber shall be smoothly refined without grains seen on the leaves. The sheets or rods shall be dusted so as to avoid sticking with each other. Reclaimed rubber shall be free from any metal piece.

4.2 Physical and Chemical Requirements

The material shall comply with the requirements given in Table 1.

5 PACKING AND MARKING**5.1 Packing**

5.1.1 The reclaimed rubber shall be packed in 50 kg bales.

5.1.2 The material shall be wrapped suitably as agreed to between the purchaser and the supplier.

5.2 Marking

5.2.1 Each bale of reclaimed rubber shall be marked with the following information:

- a) Class of reclaimed rubber.
- b) Net mass of bale.
- c) Name of the manufacturer or its trade-mark.

Table 1 Physical and Chemical Requirements for Reclaimed Rubber
(Clause 4.2 and 7)

Sl No.	Characteristic	Requirement			Method of Test Ref to IS 6306 (6)
		WTR-R (3)	TRR-N (4)	TRR-I (5)	
(1)	(2)				
i)	Volatile matter, percent by mass, <i>Max</i>	1.0	1.0	1.0	RR : 1
ii)	Acetone extract, percent by mass, <i>Max</i>	16.0	10.0	10.0	RR : 4
iii)	Ash content, percent by mass, <i>Max</i>	8	7	6	RR : 3
iv)	Carbon black, percent by mass	27±3	25±3	34±3	RR : 5
v)	Rubber hydrocarbon, percent by mass, <i>Min</i>	50	52	52	RR : 6
vi)	Relative density	1.16±0.03	1.12±0.03	1.13±0.03	RR : 2
vii)	Mooney viscosity ML at 100°C 1+4	40±5	40±5	—	RR : 7
viii)	Mooney viscosity ML at 125°C 1+8	—	—	40-50	RR : 7
ix)	Tensile strength, N/mm ² , <i>Min</i>	8.0	5.0	6.0	RR : 8 with modifications given in Annex A
x)	Elongation at break percent	280	280	450	RR : 8 with modifications given in Annex A

d) Batch number, and

e) Month and year of production.

TRR-I bales should be identified with blue strip to avoid any mix up with WTR-R or TRR-N.

5.2.2 BIS Certification Marking

The material may also be marked with the Standard Mark.

5.2.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which

the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

For the purpose of ascertaining the conformity of the reclaimed rubber in a consignment to this specification, the scale of sampling and criteria for conformity shall be as prescribed in IS 5599.

7 TEST METHODS

Tests shall be carried out as prescribed in col 6 of Table 1.

ANNEX A

[Table 1, Sl No. (ix) and (x)]

TEST RECIPE FOR COMPOUNDING OF RECLAIMED RUBBER FOR TEST OF PHYSICAL PROPERTIES

A-0 GENERAL

A-0.1 Compounding of reclaimed rubber for testing of physical properties shall be carried out as per RR:8 of IS 6306.

A-0.1.1 However, for carrying out compounding of reclaimed rubber for testing of physical properties the following composition of the mix shall be taken in the test recipe (in place of that as given in 4.1 of RR:8 of IS 6306 for each of class of reclaimed rubber as indicated against each:

a) For WTR-R and TRR-N Parts by Mass

140°C for 20 minutes

Reclaimed rubber	100.00 (as rubber hydrocarbon)
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Stearic acid (conforming to Grade 3 of IS 1675)	2.00
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Zinc oxide (conforming to IS 3399)	5.00
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For WTR-R and TRR-N

Parts by Mass

Mercaptobenzothiazole (conforming to IS 6918)	0.50
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Diphenyl guanidine (rubber grade)	0.20
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Sulphur (conforming to IS 8851)	3.00
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b) For TRR-I

Reclaimed rubber	100.00 (as rubber hydrocarbon)
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Zinc oxide (conforming to IS 3399)	5.00
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Tetramethyl thiuram disulfide (TMTD) (conforming to IS 8979)	1.00
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MBT	0.50
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Sulphur (conforming to IS 8851) (30 minutes at 160°C)	2.00
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