IS 15361 (2003): Raw Natural Rubber - Ribbed Smoked Sheets (RSS) - Guidelines [PCD 13: Rubber and Rubber Products]

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Indian Standard

RAW NATURAL RUBBER — RIBBED SMOKED SHEETS (RSS) — GUIDELINES

ICS 83.040.10

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

July 2003

Price Group 2

FOREWORD

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

At present about 72 percent of natural rubber produced in the country is in the form of sheet rubber. Sheet rubber is prepared by coagulating natural rubber latex, obtained from *Hevea brasiliensis*, processed into ribbed sheet form and dried by smoking. Ribbed Smoked Sheet (RSS) is graded by visual examination based on the norms given in International Standards of Quality and Packing for Natural Rubber Grades, popularly known as the Green Book, published under the direction of Part II of the Fourth International Rubber Quality and Packing Conference (IRQPC) held in Brussels, Belgium in June 1968. The Rubber Manufacturers Association, Inc, Washington DC was holding the Secretariat to the Fourth Conference. The Green Book has been endorsed by trade and industry in the major natural rubber producing and consuming countries in the world. Since India was not a major importer or exporter of natural rubber in the past as the domestic industry was consuming almost all the rubber produced in the country, it was not felt necessary for India to endorse the Green Book, although the specifications therein were being followed by the domestic industry and trade.

As a result of the lifting of quantitative restrictions on natural rubber, the different types and grades of natural rubber are being imported into the country. India is also exporting the natural rubber. Recently Ministry of Commerce and Industry (Department of Commerce) through notification in the Gazette of India Extraordinary [G.S.R. 897(E)] dated December, 12, 2001 amended *Rubber rules*, 1955 and as per amended *Rule* 48, every processor and every person referred in Rule 39A is necessarily required to grade and market his product in conformity with such standards as are specified by the Bureau of Indian Standards, from time to time. Indian Standards have been prepared for rubber, raw, natural (*see* IS 4588), ammonia preserved concentrated natural rubber latex (*see* IS 5430) and double centrifuged natural rubber latex (*see* IS 11001). Therefore, a need was felt to formulate a separate Indian Standard for raw natural rubber processed in the form of ribbed smoked sheet. This Indian Standard has been prepared based on the norms given in the International Standards on quality and packing for natural rubber grades, the Green Book.

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

RAW NATURAL RUBBER — RIBBED SMOKED SHEETS (RSS) — GUIDELINES

1 SCOPE

This standard prescribes the requirements, glossary of terms, packing, method of preparing bale coating solution, bale marking requirements and methods of sampling.

2 REFERENCE

The standard given below contains provision which through reference in this text constitutes provision of this standard. At the time of publication, the edition indicated was 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 edition of the standard indicated below:

IS No.	*Title*
5599 : 1999	Rubber — Raw, natural and synthetic — Methods for sampling and sample preparation

3 GRADES

This standard prescribes following six grades of ribbed smoked sheets (RSS) based on the requirements given in **5**:

a) RSS 1X
b) RSS 1
c) RSS 2
d) RSS 3
e) RSS 4
f) RSS 5

4 TERMINOLOGY

4.0 The following terminology shall be applicable for this standard.

4.1 Bark Specks or Particles — Literally it is the external covering of the woody stems, branches and roots of plants but in rubber it includes all foreign matter of organic origin.

4.2 Bleached Rubber — Rubber which has become wet and has absorbed excess moisture.

4.3 Blemishes — Any defects, stains or disfigurements not elsewhere classified except for slight milling disfigurements on ribbed smoked sheets.

4.4 Blister — A sac, pit, pocket or depression on or in a sheet of rubber resulting from decomposition and gas formation during the processing operations. The inner surfaces of blisters are frequently sticky.

4.5 Bubbles — Small round globules of air or gas within the rubber formed during the coagulation process by trapped air or slight fermentation. The surfaces inside a bubble are usually dry and are not sticky.

4.6 Burnt Sheets — Rubber which has been charred as a result of too close contact to smoke fires, resulting in a black oxidized condition.

4.7 Clean — This term when used in grade descriptions refers to a determination made by visual inspection and comparison to the pertinent sample.

4.8 Copper and Manganese Contamination — Upon visual inspection of the original sample taken from a delivery of rubber and when one or more of the following conditions (as defined herein) occur: blister, discolouration, heated rubber, oxidized rubber and sticky rubber, it may be due to the presence in the rubber of copper and/or manganese compounds. The presence in rubber of copper in excess of 8 parts per million and manganese in excess of 10 parts per million usually indicates contamination.

4.9 Dirty Packing — Any foreign matter such as grass, reeds, rattan slivers, paper, pieces of cloth, wood splinters or any other foreign matter not listed under the specifications as permissible.

4.10 Discolouration — A staining primarily indicative of biochemical degrading of the rubber as a result of packing rubber that has not been thoroughly dried. The staining may be attended by mould, heat spots, and/or foul decomposition odour.

4.11 Dry Rubber — The complete absence of any evidence of moisture as determined by visual inspection (*see also* **3.2**, **3.30** and **3.31**).

4.12 Firm Rubber — Rubber which is uniformly strong and solid as contrasted to rubber which is weak and spongy.

4.13 Foreign Matter — Any material whatsoever other than rubber hydrocarbon and the natural substances inherent in rubber latex.

4.14 Frothy Sheets — Sheets containing excess bubbles or blisters to the extent that the entire sheet shows nothing but this condition, caused by excess

fermentation during the coagulation process. These sheets are soft and deteriorated as a result of poor preparation.

4.15 Heated Rubber — Soft sticky spots or streaks appearing in the rubber, regardless of cause.

4.16 Mottled Rubber — Rubber containing spots, blotches or streaks of darker coloured rubber and/or spotted as the result of fungi.

4.17 Opaque Sheets — Non-translucent condition of sheets (principally RSS 4 and RSS 5).

4.18 Over-Smoked Rubber — Rubber which has been smoked so heavily as to have become almost opaque. This description does not include rubber which has been slightly charred as a result of too close contact to smoke fires.

4.19 Oxidized Rubber — Rubber hydrocarbon, any of its serum constituents, or any foreign matter within the rubber which have combined with oxygen to deteriorate or degrade the rubber.

4.20 Resinous Matter (Rust) — Readily visible non-rubber brownish deposit present on the surface of smoked sheets without the sheets being stretched or scratched.

4.21 Sand — The more or less fine debris or rocks, consisting of small, loose grains, often of quartz.

4.22 Skim Latex — The residual liquid, of very low dry rubber content, being the by-product of the concentration of normal liquid latex.

4.23 Skimmings — The frothy material skimmed from the top of latex coagulation tanks and giving a rubber of similar vulcanizing characteristics to normal rubber.

4.24 Sludge — Generally regarded as impurities removed from field latex and/or slushy deposits known as tank residue.

4.25 Sound Rubber — Free from any defect or weakness.

4.26 Sour and Foul Odours — This is a condition that results from putrefaction of the rubber.

4.27 Sticky Rubber — Tacky, viscous or gluey rubber

4.28 Strong Rubber — Property of resisting strain or tension

4.29 Type and Grade — Type refers to the kind of preparation given to the rubber. Grade refers to the arbitrary subdivisions made in a type of rubber with reference to quality.

4.30 Under-Cured Rubber — Portions of rubber which have not been thoroughly dried during the smoking or drying processes.

4.31 Virgin Rubber — Rubber which still retains enough of the original moisture present as to present a whitish appearance.

4.32 Weak Rubber or Short Rubber — Ribbed smoked sheet which tears easily or breaks on application of sudden tension.

5 REQUIREMENTS

5.1 General

Sheet rubber, prepared by deliberate coagulation of fresh natural rubber latex, properly dried and smoked, can only be used in making these grades. Lump, cuttings or other scrap or frothy sheets, weak, heated or burnt sheets, air dried or smooth sheets are not permissible. Wet, bleached, under-cured and virgin rubber and rubber that is not completely visually dry at the time of buyer's inspection is not acceptable (Except slightly under-cured rubber as specified in RSS 5). Skim rubber made out of skim latex shall not be used in whole or part in the production of any of these grades. It shall not be used for rubber marking patches as required in **6.1**.

5.2 Specific Requirements

5.2.1 *RSS IX*

The grade must be produced under conditions where all processes are carefully and uniformly controlled. Each bale must be packed free of mould but very slight traces of dry mould on wrappers or bale surfaces adjacent to wrapper found at time of delivery will not be objected to provided there is no penetration of mould inside the bale.

Oxidized spots or streaks, weak, heated, under-cured, over-smoked, opaque and burnt sheets are not permissible. The rubber must be dry, clean, strong, sound and evenly smoked, and free from blemishes, specks, resinous matter (rust), blisters, sand, dirty packing and any other foreign matter. Small pinhead bubbles, if scattered, will not be objected to. No master or official sample has been established for this grade.

5.2.2 *RSS I*

Each bale must be packed free of mould but very slight traces of dry mould on wrappers or bale surfaces adjacent to wrapper found at time of delivery will not be objected to provided there is no penetration of mould inside the bale.

Oxidized spots or streaks, weak, heated, under-cured, over-smoked, opaque and burnt sheets are not permissible. The rubber must be dry, clean, strong, sound and free from blemishes, resinous matter (rust), blisters, sand, dirty packing and any other foreign matter, except slight specks as shown in the sample.

Small pin-head bubbles, if scattered, will not be objected to.

5.2.3 *RSS 2*

Slight resinous matter (rust) and slight amounts of dry mould on wrappers, bale surfaces and interior sheets, found at the time of delivery will not be objected to. Should rust or dry mould in an appreciable extent appear on more than 5 percent of the bales sampled, it shall constitute grounds for objection. Small bubbles and slight specks of bark to the extent as shown in the sample, will not be objected to.

Oxidized spots or streaks, weak, heated, under-cured, over-smoked, opaque and burnt sheets are not permissible. The rubber must be dry, clean, strong, sound and free from blemishes, blisters, sand, dirty packing and all other foreign matter other than specified above as permissible.

5.2.4 *RSS 3*

Slight resinous matter (rust) and slight amounts of dry mould on wrappers, bale surfaces and interior sheets, found at the time of delivery will not be objected to. Should rust or dry mould in an appreciable extent appear on more than 10 percent of the bales sampled, it shall constitute grounds for objection. Slight blemishes in colour, small bubbles and small specks of bark are permissible to the extent shown in the sample.

Oxidized spots or streaks, weak, heated, under-cured, over-smoked, opaque and burnt sheets are not permissible. The rubber must be dry, strong and free of blemishes, blisters, sand, dirty packing and all other foreign matter other than specified above as permissible.

5.2.5 *RSS 4*

Slight resinous matter (rust) and slight amounts of dry mould on wrappers, bales surfaces and interior sheets, found at the time of delivery will not be objected to. Should rust or dry mould in an appreciable extent appear on more than 20 percent of the bales sampled, it shall constitute grounds for objection. Medium size bark particles, bubbles, translucent stains, slightly sticky and slightly over-smoked rubber are permissible to the extent shown in the sample.

Oxidized spots or streaks, weak, heated, under-cured, over-smoked (in excess of the degree shown in the sample) and burnt sheets are not permissible. The rubber must be dry, free of blemishes, blisters, sand, dirty packing and all other foreign matter other than specified above as permissible.

5.2.6 *RSS 5*

Slight resinous matter (rust) and slight amounts of dry mould on wrappers, bale surfaces and interior sheets, found at the time of delivery will not be objected to. Should rust or dry mould in an appreciable extent appear on more than 30 percent of the bales sampled, it shall constitute grounds for objection. Large bark particles, bubbles and small blisters, stains, over-smoked, slightly sticky rubber and blemishes of the amount and size-shown in the sample are permissible. Slightly under-cured rubber is permissible.

Weak, heated, burnt, oxidized spots or streaks are not permissible. The rubber must be dry, firm, free from blisters, except to the extent shown in the sample. Dirty packing, sand and all other foreign matter other than specified above is not permissible.

6 PACKING AND MARKING

6.1 Packing

All RSS grades given in IS 5599 must be packed in accordance with the following specifications. Special packing in polythene sheets, jute hessian and the like can also be used for greater protection of rubber as agreed to between the purchaser and the supplier.

6.1.1 *Weight of Bales*

The weight of each bale shall be 50 kg or 111.1 kg or as agreed to between the purchaser and the supplier. Each bale within a given consignment shall be of uniform weight, except for no more than two bales of lesser weight to provide for exact contract weight.

6.1.2 *Covering*

All RSS grades shall be covered with sheet rubber of equal or higher quality. Each bale shall be wrapped on all sides and corners. Double wrapper sheets must be used if the wrapper sheets contain holes. No metal bands or wires or non-metallic binders shall be placed under wrapper sheets.

6.1.3 *Powdering*

For RSS 1X, 1 and 2 the outside of the bales shall be lightly dusted with powder before applying the wrapper sheets to prevent sticking. Powder must not appear in any other part of the bale. For RSS 3, 4 and 5 no powder shall be used on the inside of the wrapper sheet, nor in any other part of the bale.

6.1.4 *Applications of Bale Coating Solution*

To overcome adhesion in transit and also to provide proper background for stenciling, the outside surface of the wrapper sheet must be completely painted in all six sides with one coat of official bale coating solution. No other bale coating solution may be used, except where mutually agreed to between the purchaser and the supplier.

6.2 MARKING

Each bale of RSS shall be marked indelibly with the following information:

a) Grade of the rubber;
b) Net mass of the bale;
c) Name of producer/estate or trade-mark, if any; and
d) Batch/lot number, month and year of production.

These marks must be stenciled on rubber covered bales or on the burlap or any other cover provided. No particular bale marking solution or pigment is specified.

7 BALE COATING SOLUTION

7.1 Rubber Solution Binder

625 g of natural rubber is cut to small pieces and soaked in 10 litres of solvent for 48 h. To this swollen mixture 40 litres of the same solvent is mixed and homogenized.

7.2 Bale Coating Mixture

To the rubber solution binder (*see* **7.1**), 40 kg of a suitable powder is well mixed to get homogeneous slurry.

7.3 Quantity of Bale Coating Mixture

The quantity of bale coating mixture, to be applied on each bale shall be as agreed to between the purchaser and the supplier.

7.4 Physical Requirement

The coating after drying shall impart a complete lack of adhesion when two treated rubber surfaces are compressed against each other.

7.5 Solvent Specification

The solvent used must be a hydrocarbon of petroleum distillate having a distillation range of 143 to 210°C, having a specific gravity of 0.76 to 0.83 at 25°C. The flash point in a closed cup ranges from 32 to 40°C.

7.6 Powder Specification

Water insoluble inorganic powders meeting the following requirements shall be used for making bale coating mixture.

7.6.1 *Particle Size*

100 percent penetration through a standard US Sieve No. 100 and 93 percent penetration through a standard US Sieve No. 325.

7.6.2 *Specific Gravity*

Specific gravity of the powder may be in the range 2.60 to 3.00.

7.6.3 *Physical and Chemical Requirements*

The powder used shall be white and must uniformly disperse without agglomeration upon milling. The following types, provided they are white shall be acceptable for preparing bale coating mixtures.

7.6.3.1 Mineral powders consisting mainly of hydrous magnesium silicate. These are generally known as talc, talcum, soapstone, magnesium silicate, steatite, fibrous talc and French chalk.

7.6.3.2 Mineral powders consisting mainly of hydrous aluminium silicate. These are generally known as kaolin, dixie clay, catalpo clay, china clay, etc.

7.6.3.3 Mineral or precipitated powders consisting mainly of calcium carbonate. These are generally known as whiting or chalk.

Any combination of powders listed above is permissible. Mineral powders containing calcium sulphate are not acceptable. These are generally known as gypsum or plaster of paris. Also, alpha quartz or asbestos fibers should not be contained in these powders. Use of organic materials like starch, glue or resins not permitted.

8 SAMPLING AND CRITERIA FOR CONFORMITY

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

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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