

ICS 83.080

CCS G 31



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 3398.2-2008

Replacing GB/T 9342-1988

**Plastics -- Determination of hardness -- Part 2: Rockwell
hardness**

塑料 硬度测定 第2部分：洛氏硬度

(English Translation)

Issued on: August 4, 2008

Implemented on: April 1, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China, Standardization
Administration of the People's Republic of China**

Table of Contents

Foreword
1 Scope
2 Normative references
3 Principles
4 Instruments
5 Samples
6 State regulation
7 Operation steps
8 Results show
9 Precision
10 Test report

Foreword

GB/T 3398 "Determination of Hardness of Plastics" is divided into two parts.

--- Part 1: Ball indentation method;

--- Part 2: Rockwell hardness.

This part is the second part of GB/T 3398, which is equivalent to ISO 2039-2:1987 "Plastic
--- Determination of hardness --- Part 2.

Rockwell Hardness (English version).

For ease of use, this section has made the following editorial changes.

- a) Change the word "this International Standard" to "this standard" or "GB/T 3398", change "this part of ISO 2039" to "GB/T 3398 "this section" or "this section";
- b) Delete the preamble of ISO 2039-2:1987;
- c) Added the preamble of this part of the national standard;
- d) Replace the international standards listed in the "Normative References" chapter with the corresponding Chinese national standards that are equivalent to adopting this document;
- e) Replace the decimal point symbol "," in the international standard with the decimal point symbol "." in my country;
- f) Change the Rockwell-alpha hardness "Ralpha" in the formula in Appendix A of this

international standard to "HRalpha".

This part replaces GB/T 9342-1988 "Plastics Rockwell Hardness Test Method".

Compared with GB/T 9342-1988, the main changes in this part are as follows.

--- "Not applicable to the determination of plastic films and foams" has been canceled in the scope;

--- cancel the definition;

--- Increased principle;

--- Canceled the requirements for racks, steel balls and timing devices;

--- Added 3 referenced standards and removed 1 referenced standard.

Appendix A of this section is a normative appendix.

This part is proposed by China Petroleum and Chemical Industry Association.

This part is under the jurisdiction of the National Plastics Standardization Technical Committee (SAC/TC15).

1 Scope

1.1

This part of GB/T 3398 specifies the method for determining the indentation hardness of plastics with Rockwell hardness tester M, L and R scales.

1.2

The Rockwell hardness value is directly related to the indentation hardness of the plastic material; the higher the Rockwell hardness value, the harder the material. When using this method, since Partial overlap between Rockwell hardness scales, the same material may get different Rockwell hardness values on two different scales, and these two values are technically both are likely to be correct.

1.3

For materials with high creep and high elasticity, the time factor of main load and initial load has a great influence on the test results.

1.4

Appendix A specifies another method for determining the Rockwell hardness using the Rockwell-alpha hardness scale, which shows that the Rockwell-alpha scale and GB/T 3398.1 The relationship between hardness measurement.

2 Normative references

The terms in the following documents become the terms of this part through the reference of this part of GB/T 3398. All dated citations documents, all subsequent amendments (excluding errata content) or revisions do not apply to this section, however, it is encouraged to reach the parties to the agreement research the availability of the latest versions of these documents. For undated reference documents, the latest version applies to this part.

3 Principles

3.1

The method for determining the hardness in this part is to apply a constant initial load on the steel ball above the test material within the specified loading time.

load, then apply the main load, and then return to the same initial load. The measurement result is determined by subtracting the total depth of indentation after removing the main load.

The elastic recovery in the space and the indentation depth caused by the initial load. Rockwell hardness is increased by the load on the indenter from the specified initial load to the main load, Then return to the same initial load to obtain the net increment of indentation depth.

3.2

Each division of the Rockwell hardness scale represents the vertical movement of the indenter by 0.002mm. In fact, the Rockwell hardness value is obtained by formula (1).

4 Instruments

4.1

The instrument is a standard Rockwell hardness tester, which mainly consists of the following components.

- a) a rigid frame with an adjustable table, with a flat plate with a diameter of at least 50 mm for placing the specimen;
- b) Indenters with connectors;
- c) Means for applying a suitable load to the indenter without impact.

4.2

The indenter is a hard polished steel ball that can freely roll in the bushing. The steel ball should not be deformed during the test and should not be damaged after the test.

The diameter of the indenter depends on the Rockwell hardness scale used (see 4.5).

4.3

The indenter is equipped with a dial gauge or other suitable device to measure the indentation depth of the indenter, accurate to 0.001mm. Dial gauge is best to press Rockwell hardness scale scale number (but not necessary), (each division value of Rockwell scale is 0.002mm). When the instrument is marked directly, the thousandth There are usually black and red scales on the scale, and the latter has automatically calculated the constant 130 of the Rockwell hardness of the M, L and R scales (see 3.2). as long as it is accurate the accuracy is not lower than the dial indicator, and other means of measurement and data display can also be used.

4.4 4.5 lists the loads corresponding to the M, L and R scales. The initial load in all cases was 98.07N. Rockwell Hardness Tester the workbench where the sample is placed is raised through the screw rod until the sample contacts the indenter to apply the initial load. In this case, the dial indicator has a the indicator point showing that the initial load has been applied. Before operating the hardness tester, the manufacturer's instrument manual should be consulted. Adjusting the loading speed is extremely important.

Adjust the shock absorber of the Rockwell hardness tester so that the operating handle can complete within 4s~5s when there is no sample on the instrument or no load on the anvil.

As a result, the main load used for this operation should be 980.7N.

4.5

The main load, initial load and indenter diameter of the Rockwell scale are shown in Table 1.

4.6

The instrument should be installed on a level, non-vibrating steel base. If the pedestal of the instrument cannot be protected from vibrations (e.g. on its near other testing machines), the Rockwell hardness tester can also be installed on a metal plate with a sponge rubber backing at least 25mm thick, or other materials that can have a on a pedestal with effective vibration damping.

4.7

Regularly use standard hardness blocks of known Rockwell hardness metals (cast iron, aluminum-magnesium alloy, bearing materials), and use the Rockwell E scale to calibrate the instrument.

In this way, errors caused by failure of the loading device or deformation of the frame can be found, and these errors should be corrected before the instrument is used. when when the instrument specifies the test method of R, L or M, it can often be assisted by the standard hardness block used in the corresponding test method of R, L or M.