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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 462

PLASTICS

RECOMMENDED PRACTICE FOR THE DETERMINATION OF CHANGE OF MECHANICAL PROPERTIES AFTER CONTACT WITH CHEMICAL SUBSTANCES

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BRIEF HISTORY

The ISO Recommendation R 462, *Recommended Practice for the Determination of Change of Mechanical Properties after Contact with Chemical Substances*, was drawn up by Technical Committee ISO/TC 61, *Plastics*, the Secretariat of which is held by the American Standards Association, Inc. (ASA).

Work on this question by the Technical Committee began in 1959 and led, in 1961, to the adoption of a Draft ISO Recommendation.

In June 1962, this Draft ISO Recommendation (No. 511) was circulated to all the ISO Member Bodies for enquiry. It was approved by the following Member Bodies:

Australia	Germany	Romania
Austria	Hungary	Spain
Belgium	India	Sweden
Chile	Italy	Switzerland
Colombia	Japan	U.S.A.
Czechoslovakia	Mexico	U.S.S.R.
Denmark	New Zealand	Yugoslavia
Finland	Poland	
France	Republic of South Africa	

One Member Body opposed the approval of the Draft:

United Kingdom.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in November 1965, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 462 November 1965

PLASTICS

RECOMMENDED PRACTICE FOR THE DETERMINATION OF CHANGE OF MECHANICAL PROPERTIES AFTER CONTACT WITH CHEMICAL SUBSTANCES

1. SCOPE

This ISO Recommendation describes the procedure for measuring the change in the mechanical properties of plastics after immersion in chemical substances. This method is intended for the testing of all organic plastic materials, such as cast, extruded, calendered, moulded, laminated products, both flexible and rigid, sheet, rod and tube materials.

2. SIGNIFICANCE OF TEST

2.1 This method is only suitable for the comparison of the behaviour of different plastics after immersion in chemical substances, in liquid form or in solution.

2.2 This comparison is carried out by measuring certain mechanical properties of the material before and after immersion in chemical substances.

2.3 The choice of the mechanical properties to be measured is determined according to the type of material and its foreseen applications.

2.4 The choice of reagents, temperature and duration of test is necessarily arbitrary; the list of reagents reported in section 6 serves primarily as a guide to investigators wishing to compare the relative resistance to chemicals of different plastics and to have a first assessment of their behaviour in respect to certain groups of chemical substances.

3. APPARATUS

The apparatus consists of the following:

(*a*) *Containers*: suitable jars or beakers; the dimensions should be proportionate to the test specimens; one container is provided for each test specimen.

(*b*) *Thermostatic enclosures*, suitable for maintaining the containers with the chemical reagents and the specimens at the test temperature (see clause 7.5).

(*c*) *Apparatus* for the determination of the mechanical properties to be measured; they should correspond to those described in the different ISO Recommendations referring to the mechanical property under consideration.

4. TEST SPECIMENS

The test specimens should be identical with those required in the specific ISO Recommendation referring to the mechanical property under consideration.

5. CONDITIONING TEST SPECIMENS

The test specimens should be conditioned according to ISO Recommendation R 291, *Plastics — Standard Atmospheres for Conditioning and Testing*.

6. REAGENTS

The same reagents should be used as those described in section 7 of ISO Recommendation R 175, *Plastics—Determination of the Resistance of Plastics to Chemical Substances.*

7. PROCEDURE

7.1 For each of the selected reagents and temperatures, the number of test specimens required for mechanical test in accordance with the applicable ISO Recommendation are prepared. In addition, a sufficient number of test specimens for blank tests are prepared and, if the effects of extraction of plasticizers or other soluble components are to be determined (see clause 7.10), duplicate test specimens are prepared for this purpose.

7.2 If necessary, the dimensions of the test specimens are measured, as required by the applicable ISO Recommendation.

7.3 Each test specimen, after conditioning, is placed in a separate container and totally immersed in the reagent. It is placed in such a position that it is completely surrounded by the liquid which is already at the specified temperature.

The amount of reagents used is proportionate to the container and to the test specimen, as specified in ISO Recommendation R 175, clause 6.3.

7.4 The container then is covered and kept at the test temperature for the specified time.

7.5 The immersion test is carried out at two different temperatures, i.e.

(1) (*a*) at one of the ISO standard test temperatures:

20 °C ± 2 °C 23 °C ± 2 °C 27 °C ± 2 °C

(*b*) at 70 °C ± 2 °C or

(2) at any other temperature agreed upon between buyer and seller.

7.6 The standard duration of test is 7 days. For thin films and sheets, however, a shorter duration (3 days are recommended) is suggested. This time should be stated in the specification for the material to be tested and should be reported with the test results in the test report.

NOTE.—In certain cases, however, when the normal exposure time of 7 days does not cause a measurable change of the mechanical properties, a longer immersion time, for instance a multiple of 7 days, should be chosen.

7.7 The test liquids are stirred, for instance by slow rotation of the containers, at least every 24 hours for the first 7 days and at least once a week thereafter. Highly viscous test liquids or emulsions are continuously stirred, if necessary.