Plastics Testing

Plastics testing of industrial and consumer goods

When it comes to analysis and optimization of production parameters, evaluation of tools and processing techniques or complex damage analyses, DEKRA experts are always available to you.

Our range of services in the field of plastics

- **Mechanical and technological testing of plastics**
  Tensile test (according to DIN EN ISO 527-2), compression test, bending test (according to DIN EN ISO 178), hardness test (Shore A/Shore D/IRHD according to DIN EN ISO 48), impact tests (DIN EN ISO 179 and DIN EN ISO 180)
- **Material determinations** by means of FT-IR spectroscopy, DSC analysis (differential scanning calorimetry according to DIN EN ISO 11357-2/-3), TGA (thermogravimetry according to DIN EN ISO 11358-1) for the determination and characterization of plastics, elastomers (rubber), duromers, organic substances, lubricants, resins, adhesives, paints
- **Determination of fillers (glass fibers, talc) according to DIN EN ISO 3451 with EDX analysis for determination of the chemical composition**
- **Determination of the relative viscosity DIN EN ISO 307 and DIN EN ISO 1628-4/-5**
- **Chemical resistance and compatibility to disinfectants and liquids** in the form of a self-developed method for testing the resistance of plastics to lubricants, greases, oils, chemicals and other media
- **Stress crack test on stress crack sensitive plastics** by means of TnP tests in the case of, for example, polycarbonate
- **Initial sample, series and function tests** of plastic parts (housing, bearings, gears, snap hooks)

FT-IR analysis

Infrared spectroscopy is a method of vibration spectroscopy and is used to characterize organic materials. The infrared spectrum, similar to a fingerprint, is characteristic of the molecule investigated and can be used, for example, to identify substances.

DSC (differential scanning calorimetry) according to DIN EN ISO 11357-2 /-3

Differential scanning calorimetry (DSC) is a thermal method for measuring the amount of heat emitted/absorbed by a sample during isothermal operation, heating or cooling. It is one of the most frequently used methods in the field of thermal characterization of solids and liquids.

Thermogravimetry - Thermogravimetric analysis (TGA) according to DIN EN ISO 11358-1

This thermogravimetric analysis (TGA), coupled with a highly sensitive weighing unit, offers the possibility of following the degradation processes of plastics and elastomers and drawing conclusions from them about polymer blends, admixtures or polymer damage. Furthermore, moisture and plasticizer components, the content of organic fillers, for example carbon blacks or carbon fibers, and the content of inorganic fillers and reinforcing materials can be determined very precisely.

GC/MS analysis (gas chromatography/mass spectrometry)

Gas chromatography is a very sensitive method for analyzing mixtures of substances. It can be used to separate complex mixtures of substances into the individual components. By combination with a mass spectrometer, also known as the GC/MS coupling, very small amounts of substance can be detected and at the same time information on the structure can be obtained.
The term „volatile organic compounds (VOCs) describes a large number of individual substances which are released from materials/products, for example, plastics, adhesives, lacquers and coatings.

Analysis of recycled plastic material

- **Analysis of recycled material** according to DIN SPEC 91446 for the classification of recycled plastic material via data quality levels
- **Characterization of polyethylene (PE) recyclates** according to DIN EN 15344
- **Characterization of polypropylene (PP) recyclates** according to DIN EN 15345
- **Characterization of polyvinyl chloride (PVC) recyclates** according to DIN EN 15346
- **Characterization of sorted plastics wastes** according to DIN EN 15347
- **Characterization of polyethylene terephthalate (PET) recyclates** according to DIN EN 15348 and ISO 12418-1

Checking the plastics content of products

- **Determination of the proportions of the various mixed plastics** in the products
- **Analysis of the chemical structure of microplastics** according to DIN EN ISO 24187
- **Verifying that products are free of plastics** according to Article 5 of EU Directive 2019-904

Checking packaging declarations

- Plausibility check of the composition with regard to claims such **as „free of microplastics" and „contains plastic"**
- Analysis of paper bags and **packaging from alternative raw materials**

Chemical safety of plastics

- **Harmful substances testing for compliance with the requirements of legislation about chemicals, for instance RoHS** (Directive 2011/65/EU), Annex 17 and SVHC according to REACH (Regulation [EC] No. 1907/2006), POP (Directive [EU] 2019/1021) and other international requirements (US TSCA, CP65)
- **Migration tests and sensory testing according to the requirements for plastics** that come into contact with food (LFGB [German Act on Food Products, Consumer Goods, and Animal Feed] Regulation [EU] No. 10/2011)
- **Requirements for plastics according to the German Ordinance on Consumer Goods (BedGgstV) and the Toy Safety Directive** (Directive 2009/48/EC) and/or the standard DIN EN 71
- **Emission and odor behavior as well as test chamber measurements of plastics** according to automotive standards (e.g., VDA 270, VDA 275, VDA 278) and manufacturer specifications

Other services you can profit from

As a central and international DEKRA laboratory service provider, our experts offer an interdisciplinary range of tests covering chemical safety and material quality.
These include environmental and hazardous material analyses, pollutant and emission tests of consumer goods and technical products, tests of operating materials and components, material analyses of plastics and metals, material tests, environmental simulation tests and damage analyses.
Our DIN EN ISO/IEC 17025 accredited laboratories of DEKRA Automobil GmbH in Germany are located in Bretten, Halle, Saarbrücken and Stuttgart.
In addition, we offer a variety of further testing and certification options in our worldwide DEKRA laboratory network.

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AM41 – 12.2022