

Battery electrodes are articles

The objective of this document is to explain why battery electrodes meet the definition of articles in the REACH regulation.

1. Shape, surface and design of battery electrodes

An article is defined in Article 3.3 of the REACH Regulation as „*an object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition*“.

In all battery technologies, the positive and negative battery electrodes are manufactured with mixtures of chemical substances either pasted on or integrated in a mechanical support.

There are no further changes in electrode shape or design after the manufacturing stage. The positive and negative battery electrodes are then either assembled into battery boxes/cells (either before or after they are charged), or sold directly to a limited number of industrial customers which specialize in cell manufacturing. Size, shape and design are adapted to specific customer requirements.

2. Function of battery electrodes

The function of a battery electrode is to carry energy for a given application. Although the chemical composition of a generic battery electrode determines its fundamental ability to carry the energy, it is the plate shape, surface and manufacturing design (flat or tubular plates, dimensions, the thickness of the active material) that define whether it is able to deliver the performance required for different automotive and industrial applications (SLI, stand-by, motive power etc.). Examples of different battery plate designs are given in Annex.

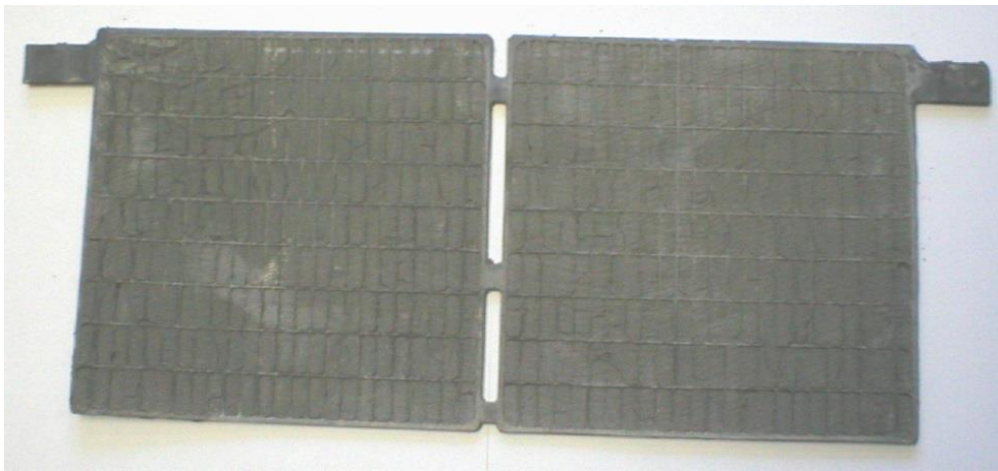
3. Battery electrodes are articles

The functionality of the battery electrode, which acts as an energy carrier within the battery, is determined more by its special shape, surface and design than by its chemical composition, therefore EUROBAT and RECHARGE conclude that an electrode is an article according to the REACH Regulation.

Annex: Different designs of Battery Electrodes

The below diagrams demonstrate the different shapes and designs used for battery electrodes according to the required application.

A/. Flat Plates (Positive and Negative)



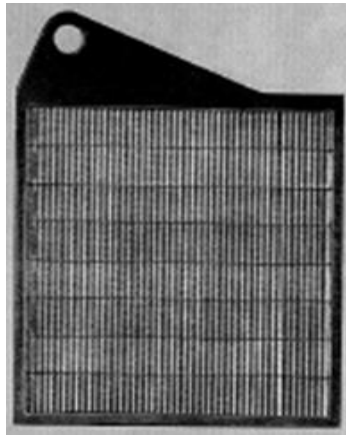
Lead-acid flat plates

B/. Tubular Plates



Lead-acid tubular plates

C/. Pocket Plate Electrodes



Pocket plate electrode for Ni-Cd batteries

D/. Plastic Bonded Electrodes



PBE electrode for Ni-Cd batteries

E/. Sintered Electrodes



Sintered Electrode for Ni-Cd batteries

F/. Difference in Battery Plate Structures

This diagram outlines how plate thickness and structure is adapted to influence battery performance. Thick plates allow for improved lifetime and cycling behavior, while thin plates allow for high current discharge.

