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International Safety Standards

Due to the global orientation of the agricultural machinery industry and the resulting demand for global regulations, the importance of international safety standards has increased significantly. In the past, international safety standards were primarily important on export markets outside of Europe. In the future, however, they will provide the safety-technological regulations for agricultural machinery. This growing significance is shown in this contribution.

Before the EC Machinery Directive went into effect, both international (ISO) and national (DIN) safety standards for agricultural machinery existed in Europe. Often, ISO safety standards formed the basis for national safety standards. Since the safety requirements in Europe were not harmonized, however, national safety standards had a greater significance in this field. ISO safety standards were primarily important for access to export markets outside of Europe.

European Standardization

With the final application of the EC Machinery Directive in 1993, the different safety requirements in Europe were harmonized. This directive was developed according to the so-called "New Approach", whose main characteristics are a wide range of application and the determination of only the most basic safety requirements. These basic requirements are put into concrete terms by so-called "harmonized" standards, which are developed on behalf of the Commission, i.e. under a mandate, by the European Committee for Standardization (CEN) and published in the Official Journal of the EC. Thus, these standards fulfill the presumption of conformity. This means that if a machine conforms to such a standard, the requirements of the directive are assumed to be met as well.

With the New Approach, European safety standards became far more significant. Therefore, standardization activities strongly focused on the CEN. Today, more than 600 harmonized standards supplementing the Machinery Directive are listed in the Official Journal of the EC. Among these, three types of standards can be distinguished (Table 1).

The standardization of agricultural machinery falls under the scope of the Technical Committee CEN/TC 144 "Tractors and Machines for Agriculture and Forestry", which has developed approximately 30 European safety standards for agricultural machinery so far.

The Transition from CEN to ISO

The agricultural machinery industry and its markets are traditionally globally oriented and therefore demand regulations which apply worldwide. Thus, it makes little sense to develop safety standards for Europe alone. When the EN safety standards were revised, an agreement was found which provides that standards are developed in cooperation between ISO and CEN according to the so-called Agreement of Vienna. This allows a European (EN ISO) and an international standard (ISO) to be developed at the same time with identical numbers and contents. Common revision has also become necessary be-

Table 1: Types of EN safety standards

Type A: Basic safety standards:	fundamental concepts, design principles
Type B: Safety group standards:	special safety aspects, safety equipment
Type C: Machinery safety standards:	e.g. CEN/TC 144 standards

Table 2: ISO and EN safety standards for agricultural machinery

ISO standard	Title	EN standard
ISO 4254-1	General Safety Requirements	EN 1553
ISO 4254-5	Power-Driven Soil-Working Equipment	EN 708, EN 708 A1
ISO 4254-6	Equipment for Crop Protection	EN 907
ISO 4254-7	Combine Harvesters, Forage- and Cotton Harvesters	EN 632
ISO 4254-8	Solid Fertilizer Distributors	EN 14017
ISO 4254-9	Equipment for Sowing, Planting and Distributing Fertilizers	EN 14018
ISO 4254-10	Rotary Tedders and Rakes	so far no EN
ISO 4254-11	Pick-up Balers	EN 704
ISO 4254-12	Rotary Mowers and Flail Mowers	EN 745

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cause ISO also provides safety standards and the relevant ISO 4254 safety standard series, which consists of 9 parts, also needed to be revised. *Table 2* provides an overview of the connections between existing EN- and ISO standards.

Whereas the scope of the existing ISO 4254 standard series comprised tractors as well as agricultural and forestry machines, the new standard series only applies to agricultural machines. For this reason, ISO 4254-2 (Anhydrous Ammonia Applicators, withdrawn), ISO 4254-3 (Tractors, in the future ISO 26322-1 Standard Tractors and ISO 26322-2 Narrow Track- and Small Tractors) as well as ISO 4254-4 (Forestry Winches, replaced by ISO 19472) are not included in the overview. So far, only ISO 4254-1 has been completed. Meanwhile, EN 1553 has been replaced by EN ISO 4254-1. In addition, the final drafts for ISO 4254-5 and ISO 4254-7 have recently been adopted. The publication of these standards is being prepared. The other parts are still being worked on. The standards of the new series ISO 4254 will be taken over with the same standard number and unchanged contents as EN ISO standards and will thus replace the existing EN standards.

Within the machinery-producing industry, the agricultural machinery industry was the first sector which began with the development of EN ISO safety standards. Meanwhile, this approach has been taken over by other sectors of machinery construction. Today, several European type A- and type B standards have already been taken over as EN ISO standards.

Tractors

In contrast to agricultural machines, tractors are subject to separate regulations in the form of the EC type approval procedure. In addition to the framework directive 2003/37/EC, more than 20 separate directives govern 30 technical subjects, which can be divided into the areas traffic safety, work safety, and environmental protection. Due to the rapid technical development of tractors, however, it is becoming more and more difficult for the legislator to adapt the separate directives quickly enough. In addition, global regulations are also required in this field. Therefore, separate directives are intended to describe only the administrative procedures in the future, whereas the technical requirements will be governed by ISO standards. These ISO standards are developed in the ISO tractor committee ISO/TC 23 SC 4 (Tractors), whose secretariat is held by Germany.