



## **BUSINESS PLAN**

**CEN/TC 458**

**"Stirring and mixing industrial equipment (provisional)"**

### **EXECUTIVE SUMMARY**

#### **Business Environment**

Mixing operation occurs in most of process activities such as: chemicals, food & beverages, pharmaceuticals, cosmetics, oil, water treatment, mining & minerals, paper industries, paints, adhesives, polymers, plastics...

Mixing is supported by new tools such as numerical simulation and new measurement methods, but main part of designers and users acknowledge is based on empirical calculations and experience.

Stakeholders are customers, suppliers, employees, research institutes, universities, authorities in charge of health and safety...

#### **Benefits**

- Better understanding of the efficiency of the mixer and the demand of the user.
- Saving time, energy for driving the mixer.
- Decreasing loses of product, by-products, cost of maintenance, process energy.

#### **Priorities**

Standardize the way to evaluate the real performance of the technology of agitators or impeller and the terminology regarding all relevant sectors of industry.

## **1 BUSINESS ENVIRONMENT OF THE CEN/TC 458**

### **1.1 Description of the Business Environment**

The following political, economic, technical, regulatory, legal, societal and/or international dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this CEN/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

- ❖ Mixing operation is present in most of process activities such as: chemicals, food & beverages, pharmaceuticals, cosmetics, oil, water treatment, mining & minerals, paper industries, paints, adhesives, polymers, plastics...
- ❖ The objective of mixing is to elaborate any product by promoting an intimate contact between components (liquid, gas and solid separately or combined) to make them reacting and/or to keep the mixture in specific conditions. Mixing consists of basic operations such as blending, keeping in suspension and more complex operations necessary for e.g. high pressure reaction, fermentation under sterile conditions...
- ❖ Mixing requires a multidisciplinary approach combining chemical engineering, mechanics of fluids and mechanics of solid.
- ❖ Mixing is supported by new tools such as simulation of fluid dynamic (CFD) and other finite elements methods, and new measurement methods such as laser Doppler anemometer, but main part of designers and users acknowledge is based on empirical calculations and experience. Nevertheless, those new tools allow to predict mixing results much better than formerly. To know what new tools afford such as fluid velocity profile, local pressure as well as in the whole tank, dead zones, deposit, high temperature spot, is quite comforting and avoids damage on the product and enhances the productivity.
- ❖ Another important point is that many new products that are manufactured in more and more severe and strict conditions need to adapt the mixing equipment taking into account new parameters. Research and development in "niche" segments will drive the demand for higher technologically improved mixers. In addition, the integration of automation electronics and logic controllers will improve the process of manufacturing.
- ❖ The mixing equipment is mainly used by industrial companies and stakeholders are customers, suppliers, employees, research institutes, universities, authorities in charge of health and safety... The concerns and perceptions of those stakeholders are:
  - Some key factors as product reliability, less maintenance and better capability are expected.
  - New products in the pharmaceutical and food industries such as bioreactors cell cultures, manufacture of vaccines as other products in fine chemicals lead to design innovative mixing equipment for a better reliability.
- ❖ Manufacturers in collaboration with research institutes are expected to develop innovative mixers and agitators for the pharma industry.

## 1.2 Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the CEN /TC 458.

CEN/TCs with scopes related to specific industry sectors, products or materials may wish to consider indicators such as:

- ❖ Worldwide market is around 2.3 \$Billion expected in 2018, it is a mature market.
- ❖ UE market is estimated around 800 \$M for 2018.
- ❖ Several mixing equipment model are used the main market is held by "agitators" or impeller market, for more than 70%.
- ❖ CAGR is calculated as 2.7% for 2018.
- ❖ Source from Frost & Sullivan market study (10-8D-10)

Field of activity	Market in %
Chemicals	30
Pharmaceuticals	10
Food & beverages	20
Paint , adhesives	10
Cosmetics and personal care	10
Other (pulp & paper, mining & minerals, rubber..)	20

- ❖ In EU more than 60 manufacturers exist.

## 2 BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC 458

An estimated lost for users that use a non-efficient mixer or non-appropriate equipment due to a lack in knowledge in mixing has been evaluated by 2 major companies in USA of more than 1 \$Billion a year. Major savings are expected from the following;

- ❖ Better understanding of the efficiency of the mixer.
- ❖ Better understanding of the demand of the user.
- ❖ Saving time.
- ❖ Saving energy for driving the mixer.

- ❖ Decreasing loses of product.
- ❖ Decreasing by-products.
- ❖ Decreasing cost of maintenance.
- ❖ Decreasing the CAPEX & OPEX.
- ❖ Decreasing the process energy (heating or cooling during mixing as the energy to drive the impeller).

### **3 PARTICIPATION IN THE CEN/TC 458**

All the CEN national members are entitled to nominate delegates to CEN Technical Committees and experts to Working Groups, ensuring a balance of all interested parties. Participation as observers of recognized European or international organizations is also possible under certain conditions. To participate in the activities of this CEN/TC, please contact the national standards organization in your country.

## **4 OBJECTIVES OF THE CEN/TC 458 AND STRATEGIES FOR THEIR ACHIEVEMENT**

### **4.1 Defined objectives of the CEN/TC 458**

The main objective is to develop a complete set of standards dealing with in the field of dynamic agitators and including different concerns like vocabulary, performances, test procedures, design, environmental aspects, safety aspects, quality parameters, etc.

### **4.2 Identified strategies to achieve the CEN/TC 458s defined objectives.**

- ❖ The priority is to standardize the terminology because mixing field is so diverse and is concerning so many products and applications. This old activity quite complex is still based on empirical laws and experience and they have collected lots of terms coming from others fields that are not appropriate and leads to confusion for the user.
- ❖ As 70% of equipment consists of agitators or impeller, the second priority is to evaluate the actual performance of this technology in order to know the operating time and the degree of quality of the mixed product in accordance with the expected productivity.
- ❖ Other type of mixers and other aspects should be covered later.

### **4.3 Environmental aspects**

- ❖ Some mixers are already used in application related to environment protection such as waste water treatment.
- ❖ The main environmental impacts are:
  - Energy consumption of the mixer.

- Influence of the mixer on the energy efficiency of the process.
- Influence of the mixer on quantity of sub products and wastes that have diverse negative environmental impacts.

Those impacts are taken into account with TC prioritization.

- ❖ A general eco-design method such as CEN/TS 16524 *"Mechanical products - Methodology for reduction of environmental impacts in product design and development"* can be used for mixers, but CEN/TC 458 can also develop more specific standards.

## **5 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE CEN/TC 458 WORK PROGRAMME**

Not identified at this time.