ComInTec®
North America

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WHY USE A TORQUE LIMITER

A torque limiter (or safety clutch) is a mechanical device designed to protect transmission systems from overloads.

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TORQUE LIMITER: WHAT IS IT AND WHAT IS IT USED FOR?

Its operation is simple but fundamental: when the transmitted torque exceeds a **set limit value**, the device **automatically intervenes**, preventing damage to the system or its components.

In a mechanical transmission, exceeding the **rated torque** can lead to:

- **Component failure;**
- **Machine downtime;**
- **Costly plant stoppages;**
- **Loss of productivity.**

The torque limiter prevents all of this by activating at the precise moment when a **fault** occurs.

WHAT ARE THE BENEFITS OF HAVING A TORQUE LIMITER?

Within a mechanical transmission, the **behavior** of the system changes significantly depending on whether or not a torque limiter is present.

Under **normal conditions**, the transmission operates within a predetermined and calculated torque value; the system functions smoothly. When an anomaly occurs, such as an **obstacle, a jam or an overload**, the system is faced with a situation that needs to be managed:

- **Without a torque limiter**, the increased torque is discharged directly onto the transmission components, eventually causing the weakest element to fail;
- **With a torque limiter**, the device automatically intervenes when the torque exceeds the set value, thereby protecting the system.

Depending on the technology used, this intervention can take place in various ways:

- **Slippage** (friction-type limiters): The device limits the transmitted torque by allowing relative slippage between the driving and driven components while keeping the transmission active in a controlled manner;
- **Disengagement** (ball or roller limiters): The system completely separates the drive, stopping the transfer of power;
- **Continuous adjustment** (pneumatic limiters): The torque is controlled dynamically, adapting to the operating conditions.

In all cases, the goal is the same: **to prevent damage, breakages and machine downtime**, while keeping the system under control even under critical conditions.

ADVANTAGES OF A TORQUE LIMITER

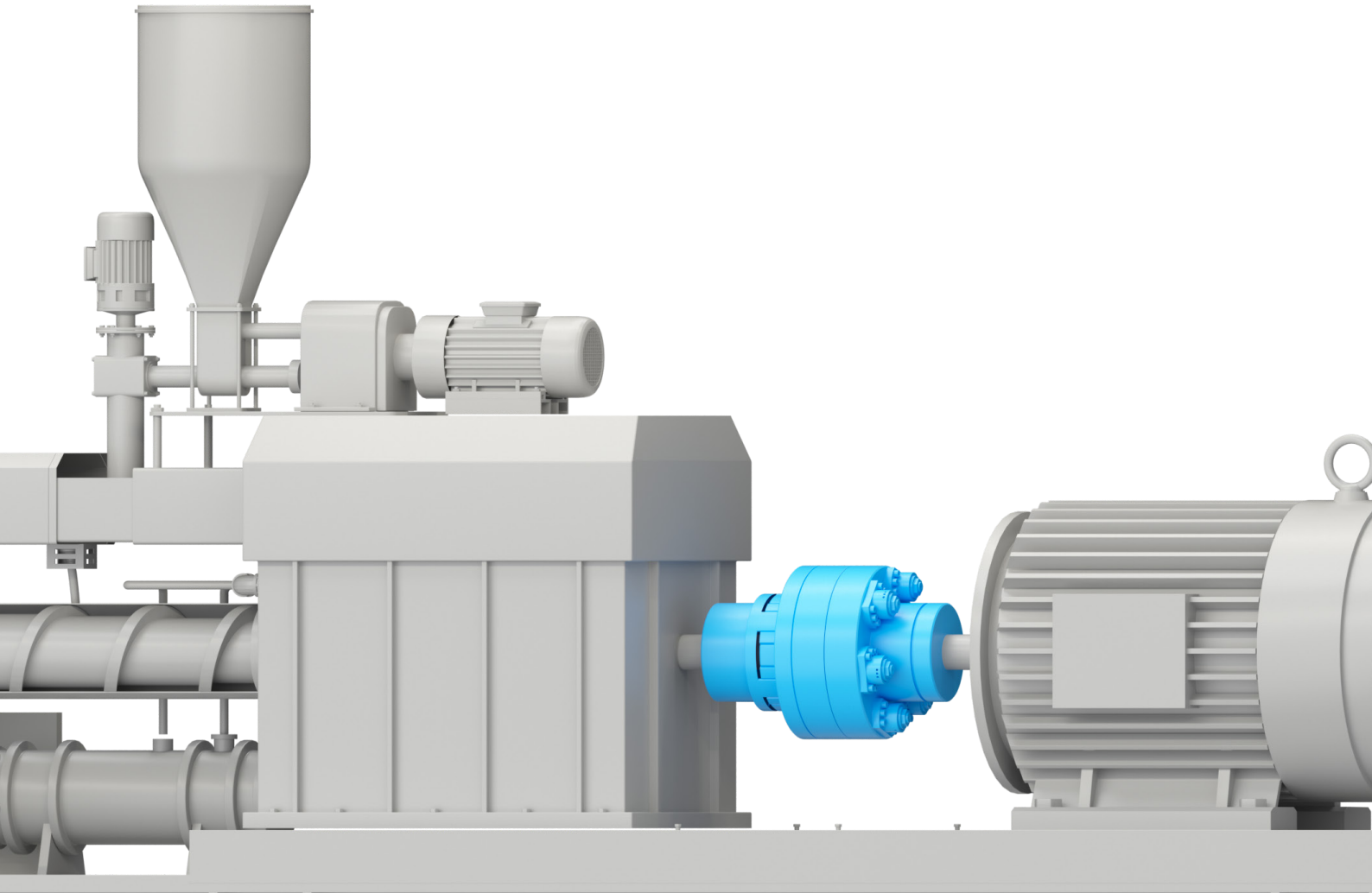
Using a torque limiter delivers tangible benefits across the entire production line:

- **Enhanced mechanical safety**: prevents breakage and damage;
- **Increased system reliability**: protects components over time;
- **Reduced downtime**: prevents sudden stoppages;
- **Cost optimization**: less maintenance and fewer replacements;
- **Increased productivity**: guaranteed operational continuity;
- **Increased machine value**: improves overall performance.

THE MAIN APPLICATIONS OF A TORQUE LIMITER

Torque limiters are used in all situations where it is necessary to protect a mechanical drive from **sudden overloads.**

- In **industrial automation systems**, they play a crucial role in managing peak loads, helping to keep production lines operating stably even in the event of faults or sudden changes.
- In the **packaging and printing** sectors, where speed and **synchronization** are critical, the limiter protects systems from jams and overloads, preventing machine downtime and production waste, and ensuring operational continuity and precision.
- Even in the most demanding sectors, such as **woodworking, sheet metal processing, mining industry or industrial shredders**, this device is essential to absorb shocks and high loads, thereby preserving the integrity of the machine.
- In **conveyor systems, pumps, compressors and fans**, as well as in test benches, the torque limiter helps to keep operating conditions under control, protecting both the mechanical components and the quality of the process.
- Finally, in the **food and textile industries**, where reliability and continuity are essential, it provides an effective solution to reduce the risk of downtime and ensure consistent production.



REGULATIONS AND SAFETY: ROLE IN THE MACHINERY DIRECTIVE

Incorporating a torque limiter is not only good engineering practice, but also meets the **fundamental safety requirements** established at the European level. The **Machinery Directive 2006/42/EC** requires manufacturers to carry out a **risk analysis** and to incorporate **protective measures** to eliminate or reduce hazards.

In particular, Annex I of the Directive sets out clear principles:

- **1.1.2. Principles of safety integration**: The Directive requires that risks be "eliminated or reduced as far as possible (inherently safe design)". The torque limiter is a perfect embodiment of this principle.
- **1.3.2. Risk of breakage during operation**: "The various parts of the machinery [...] must withstand the stresses to which they are subject". A torque limiter ensures that these stresses never exceed the design limits.
- **1.3.7. Risks related to moving parts**: "All necessary measures must be taken to prevent moving parts involved in the work from stopping suddenly". The limiter prevents the consequences of such a blockage.

Furthermore, the use of reliable components such as torque limiters helps to raise the **Performance Level (PL)** of a safety function in accordance with **EN ISO 13849-1**, thereby reducing the likelihood of hazardous failures and increasing the machine's overall safety level.

TAILOR-MADE SOLUTIONS: COMINTEC'S KEY STRENGTH

We are well aware that every industrial plant presents unique challenges. This is why ComInTec not only offers standard products, but its strategic strength lies in **full customization**.

We are able to design and adapt our torque limiters to meet the **customer's specific requirements**, in terms of both performance and size and dimensions.

Our goal is to provide **tailor-made solutions** without any compromises: each **customization** is designed to ensure seamless integration into your system, while strictly maintaining the quality, reliability and functionality that distinguish ComInTec products.

FOR MORE INFORMATION

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