

TAC & TAICROS®

Crosslinkers for Rubber Applications

Introduction

Peroxide crosslinking of rubber is a growing technology due to increasing requirements for material heat resistance and aging stability. A great number of synthetic elastomers can be crosslinked by peroxides; typical examples are EPDM, HNBR, TPE, FKM, EVA.

The peroxide efficiency can be significantly improved by using our crosslinking additives TAC and TAICROS®.

Advantages of TAC & TAICROS® in crosslinking of elastomers

When TAC & TAICROS® are used in combination with peroxides the increase of crosslinking efficiency can be utilized in two directions: on one side TAC or TAICROS® can be added on top of the regular peroxide concentration to increase the crosslinking density (see Figure 1) and improve all properties aligned with this as e.g. compression set and aging resistance (see Figure 2 and 3). Additionally, cure speed is increased.

Benefits

- Reduction of cure time cost savings/higher output
- Increased crosslinking density or less peroxide necessary
- Lower compression set
- Improved aging properties
- Higher chemical resistance
- Less residual peroxide and byproducts

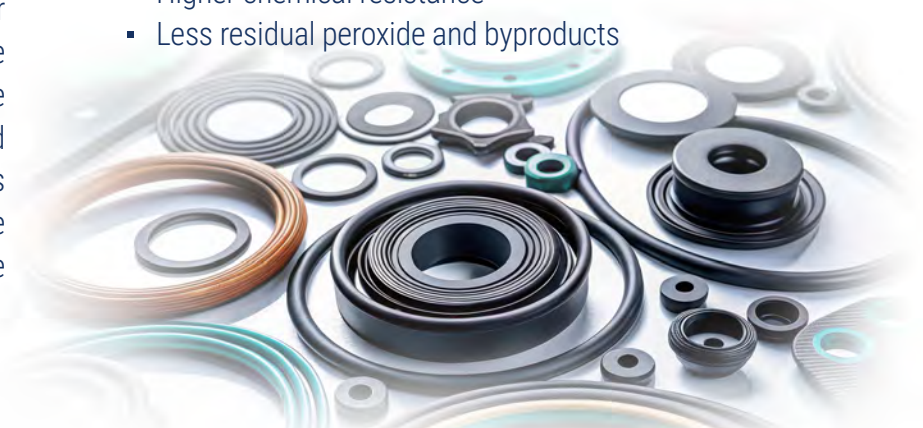


Figure 1

Increased crosslinking degree with TAC and TAICROS® (silica-filled EPDM formulation/MDR 165 °C)

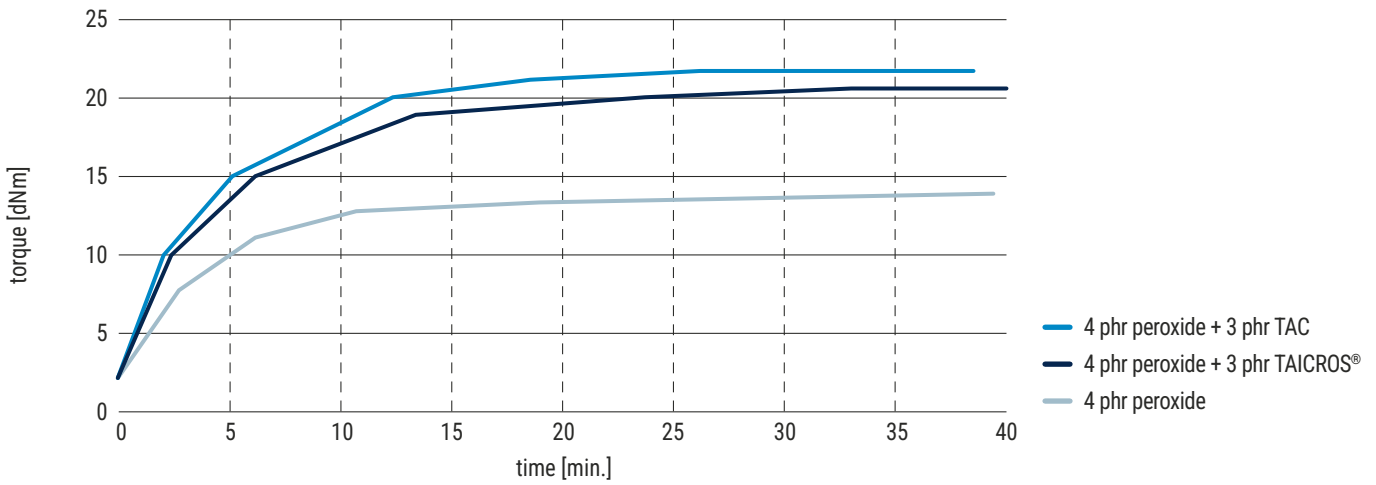


Figure 2

Reduced compression set with TAC and TAICROS® (silica-filled EPDM formulation/72h@ 100 °C)

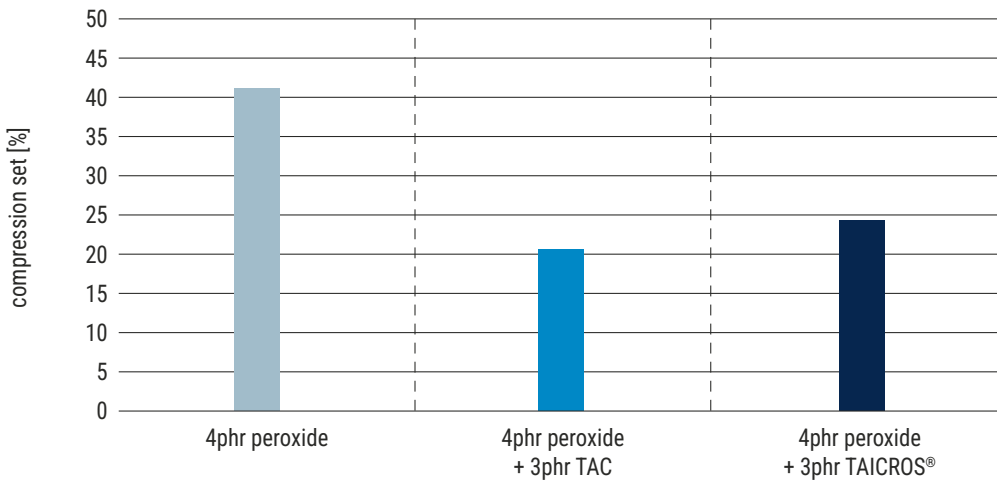
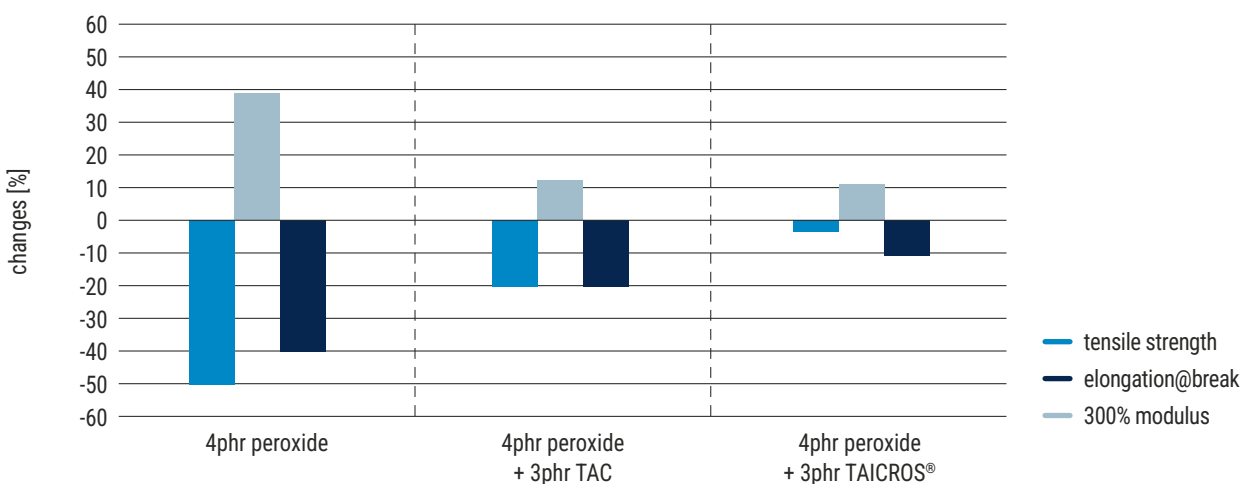


Figure 3

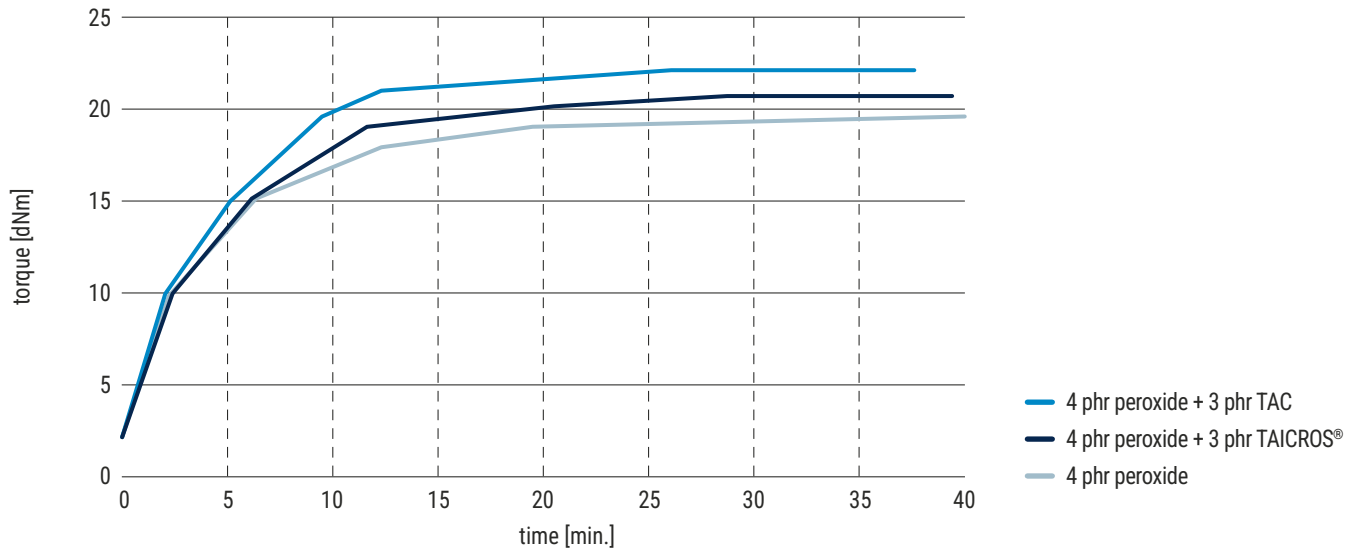
Improved aging resistance with TAC and TAICROS® (silica-filled EPDM formulation/aging [7d@ 125 °C])



Explanations to the diagrams: The peroxide in the formulation is dicumylperoxide as 40% preparation on silica. TAC or TAICROS® are used as 50% preparations on silica.

On the other side a part of the peroxide can be replaced by TAC or TAICROS® to reduce the disadvantages associated with the peroxide like volatile or toxic byproducts or blooming without a reduction of crosslinking degree (see Figure 4).

Figure 4
Reduction of peroxide by TAC and TAICROS® (silica-filled EPDM formulation/MDR 165 °C)



Also, the residual peroxide content, which accelerates aging significantly, is reduced in this case. In formulations where more expensive peroxides are required, TAC & TAICROS® can help to reduce cost.

Applications

Typical applications of TAC & TAICROS® are:

- Pipes and hoses
- Heat shrink tubes
- Gaskets and sealings
- Foams and damping materials
- Cable insulations
- Electrical and electronic components
- Solar module encapsulation



Quality

In the rubber industry typically powder grades of TAC & TAICROS® are used. The powder grade qualities are preparations of the products on silica. These formulations are available in different concentrations on the market. The pure products are offered with a very high purity and low color. High quality is guaranteed by production at a dedicated plant site in Germany, WeylChem Wesseling's proprietary processes with low byproduct formation, and full backward integration into raw materials. WeylChem Wesseling is certified according to ISO 9001, 14001 and 50001.

Handling and Safety

Both products are classified as harmful, therefore, appropriate protection measures are recommended for handling the pure products as well as the powder grades. Due to the slow biodegradability measures have to be taken to avoid contamination of the environment (for details see MSDS).

The pure products are handled liquid, but can crystallize depending on storage conditions due to their melting point of 27/25 °C. In case they are crystallized, they need to be remelted before use. Remelting can be accomplished at a maximum of 40 °C in a heating chamber or a water bath. Careful temperature control is important to avoid overheating and exothermic polymerization. Complete liquefaction and thorough mixing are essential to ensure a uniform distribution of the stabilizer and thus, to guarantee uniform quality. TAICROS® M is a powder with a melting point of 84 °C.

Storage

TAC & TAICROS® (the pure products as well as the powder qualities) should be stored under dry and cool conditions in a well-ventilated area, protected from direct sunlight. Storage temperatures of above 40 °C over a longer period of time should be avoided. Under these conditions we guarantee a shelf life of 18 months (TAC) and 24 months (TAICROS®) starting from production date. Our TAICROS® M has a shelf life of 12 months.

Regulations

TAC & TAICROS® are registered under REACH. Both products do not contain any SVHC. TAC and TAICROS® are in accordance with RoHS guideline 2002/95/EC and its subsequent amendments. Additional information on regulatory aspects is available upon request.

This information and any recommendations, technical or otherwise, are presented in good faith and believed to be correct as of the date prepared. Recipients of this information and recommendations must make their own determination as to its suitability for their purposes. In no event shall WeylChem Wesseling assume liability for damages or losses of any kind or nature that result from the use of or reliance upon this information and recommendations.

WeylChem Wesseling expressly disclaims any representations and warranties of any kind, whether express or implied, as to the accuracy, completeness, noninfringement, merchantability, and/or fitness for a particular purpose (even if WeylChem Wesseling is aware of such purpose) with respect to any information and recommendations provided.

Reference to any trade names used by other companies is neither a recommendation nor an endorsement of the corresponding product, and does not imply that similar products could not be used. WeylChem Wesseling reserves the right to make any changes to the information and/or recommendations at any time, without prior or subsequent notice.



WeylChem Wesseling GmbH

Brühler Straße 2 , 50389 Wesseling
Germany
www.weylchem.com

Commercial contact

Ms. Christina Feußner
christina.feussner@weylchem.com

Mr. Mengbo Ge
mengbo.ge@weylchem.com

Technical contact

Ms. Dr. Wibke Hartleb
wibke.hartleb@weylchem.com