

**Cohedur®
A 200**

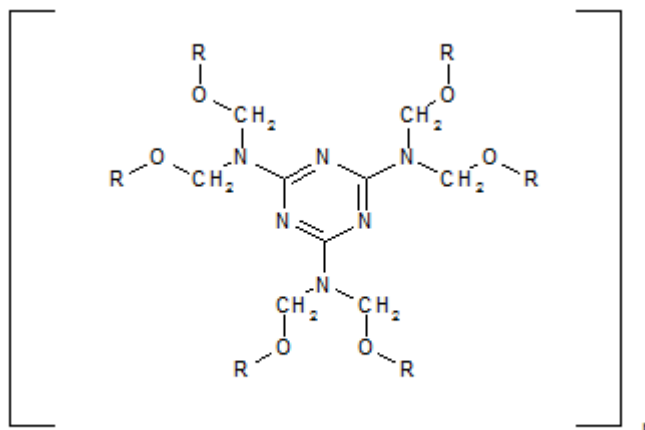
Specialty and Standard Chemicals

Function

Cohedur® A 200 is a direct bonding agent for rubber to fabric and rubber to steel cord bonding.

Product description

Composition: hexamethoxymethylmelamine ether (HMMM)



R = -CH₃, -H, -CH₂-

Appearance: clear to cloudy liquid, colorless to yellow
Density (at 20 °C): approximately 1.2 g/cm³

<u>Property</u>	<u>Nominal value</u>	<u>Unit</u>	<u>Test method</u>
Nitrogen content	23.3 ± 0.7	%	Elementary analysis
Viscosity (at 25 °C)	≤ 8000	mPa.s	DIN 53 019
pH value (50 % in water)	8.0 ± 1.0	---	DIN 19 268

Use

Mode of action: Cohedur® A 200 is a component of the direct bonding system, also known as Cohedur® or RFS system. RFS bonding systems are multi-component systems. They are created by providing the rubber compound with a resorcinol component, a methylene component, and reinforcing silica, e.g. Vulkasil® S. The bonding effects of RFS systems result from a condensation reaction between the resorcinol and a methylene component, which takes place during the vulcanization and is catalyzed by the silica.

Cohedur® A 200 functions as methylene component. Resorcinol components are Cohedur® RS and Rhenogran® Resorcin-80 or Cohedur® RK (specially developed for polychloroprene).

The bonding agents belonging to the Cohedur® range are most effective in such diene rubbers as natural rubber, SBR (e.g. Krylene®), BR (e.g. Buna® CB, Taktene®), NBR (e.g. Perbunan® NT, Krynac®), and CR (e.g. Baypren®). They also improve the adhesion substantially when used with polymers having a higher degree of saturation, e.g. EPDM (e.g. Buna® EP). Their use in conjunction with silicone rubber is not recommended. The most commonly used textile fibers, such as rayon, polyamide, and polyester (with special spin finish), and brass- or zinc-plated steel cord can be bonded to the rubber directly with the Cohedur® system. Where zinc-plated steel cord is

concerned, the addition of lead oxide (e.g. Rhenogran® PbO-80) improves the adhesion between metal and rubber.

Processing:

Owing to the thermal sensitivity of the RFS bonding system, Cohedur® A 200 is best added as the final ingredient of the mix, preferably together with sulfur and accelerator. It is absorbed rapidly and disperse well.

When the liquid grade is incorporated on a mixing mill, a slippery film may be formed on the bank, whereby the incorporation time may be extended. The solid Cohedur® A 250 grade is considerably easier to handle and incorporate than the liquid grade. The batch temperature should be kept as low as possible during the mixing process. No difficulties are encountered at temperatures up to about 90 °C and temperatures up to 110 - 120 °C can be tolerated for short periods.

The Cohedur® A grades do not bloom. Together with resorcinol they form rubber-soluble adducts, thereby suppressing the blooming tendency of resorcinol. Unlike Cohedur® A, hexamethylene tetramine, another possible methylene component of the RFS systems, and resorcinol are able to form resotropine, a rubber-insoluble adduct, which may cause blooming.

The selection of the curing system is an important aspect for bonding compounds. Accelerators must be chosen to permit sufficient flow time for adhesion development before the scorch has proceeded too far. Where textiles are concerned, good results have been achieved with conventional vulcanization systems, e.g. those which include 2.5 phr sulfur and sulfenamides as accelerators. Secondary acceleration by a guanidine accelerator (Vulkacit® D) is recommended, ultra-accelerators have predominantly adverse effects on the adhesion. Sulfur has a decisive adhesion-promoting effect where bonding of rubber to steel cord is concerned. The adhesion therefore improves as the proportion of sulfur is increased (4 - 7 phr). Sulfenamides should be used as accelerators, Vulkacit® DZ (DCBS) giving the highest bond strength values. Of the methylene components, Cohedur® A tends to retard the scorch, whereas hexamethylene tetramine, which is also a basic accelerator, impairs the scorch resistance.

Cohedur® bonding compounds can be cured by the usual methods at temperatures within a wide range, e.g. 130 - 190 °C. Press cures give the best adhesion values because the molding pressure forces the compound deep into the fabric or steel cord structure. Vulcanization in hot air, or steam, is possible also.

Vulcanizate Properties:

As a result of the condensation process, RFS bonding systems slightly raise the modulus, tensile strength, and the hardness of the vulcanizates, while reducing elongation at break.

Cohedur® A grades have no staining effect themselves. However, because they react with resorcinol to form resorcinol-melamine resins, they give light-colored vulcanizates a reddish brown color. Resins formed in this way do not stain through contact. The discoloration can be reduced by adding titanium dioxide.

RFS systems which contain Cohedur® A are free from disadvantages of hexamethylene tetramine, such as its adverse effect on the scorch resistance of the compound, its damaging effect on polyester fibers by aminolysis, and its tendency to intensify the corrosion of steel cord.

Dosage:

Typical levels of addition based on 100 parts by weight of elastomer are:

Cohedur® A 200	2.3	phr
Cohedur® RS	3.4	phr
Vulkasil® S	15 (10 - 30)	phr

Packaging

250 kg rolling channel drum on 1000 kg skid.

Storage stability

In original closed containers under cool (approximately 25 °C) and dry conditions 730 days from date of production. If stored below approximately 5 °C crystallization can occur.

Handling

For additional handling information on Cohedur® A 200 please consult current safety data sheet.

These raw material properties are typical and, unless specifically indicated otherwise, are not to be considered as delivery specification.

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