

VESTAMID®

for lines in the nitrogen oxide reduction system

To restrict environmental emissions from road vehicles, the European Parliament has further tightened the Euro 5 and Euro 6 standards as regards emission limits for light road vehicles with diesel engines, particularly as regards particle and nitrogen oxide emissions. In order to meet the latter requirement, car makers are currently developing systems for selective catalytic reduction (SCR) of nitrogen oxides.

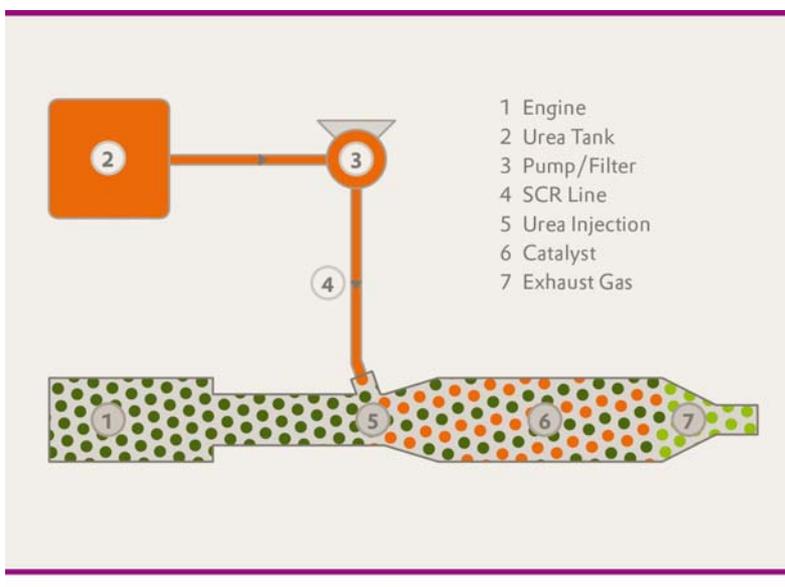
The reducing agent

The reducing agent here is a 32.5% aqueous solution of urea, registered by the VDA (the German Association of the Automotive Industry) as AdBlue®. At temperatures above 60°C, AdBlue® reacts with water to yield carbon dioxide and ammonia; the latter in turn reacts with nitrogen oxides, forming water and nitrogen and thus reducing the emission of nitrogen oxides by about 90%.

AdBlue® places the following high demands on the catalyst feed lines:

- chemical resistance to urea and ammonia as well as to any gas mixture flowing back from the catalyst
- hydrolytic resistance up to at least 60°C, the maximum temperature of the urea solution
- high impact resistance and busting strength in the cold because AdBlue® freezes with expansion at -11°C

Catalytic reduction of nitrogen oxides



A number of different VESTAMID® polyamide 12 compounds satisfy all these requirements.

Evonik helps car makers develop their systems by offering a variety of products for systems that have various requirements. All VESTAMID® molding compounds were subjected to a recirculation test with AdBlue® at 60°C and 80°C (for external air temperatures of 40°C and 50°C, respectively) over a period of 5,000 hours to detect any changes in their mechanical properties. All of the tested grades have excellent values for strain at break and breaking strength, bursting strength, and, in particular, low-temperature impact strength at -40°C. Of all the grades tested, VESTAMID® LX9008 best satisfied all the requirements. VESTAMID® L2140 and X7293 are already being used in SCR systems.

VESTAMID® grades suitable for SCR lines

VESTAMID®	L2140 PA12-HL	LX9008 PA12-HIHL	X7293 PA12-HIPHL	MSR 8000
Resistance to AdBlue®	++	++	++	++
Hydrolytic resistance	0	+	0	++
Resistance to exhaust gases	++	++	to be determined	to be determined
AdBlue® frost resistance	0	+	to be determined	to be determined

® = registered trademark

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