CUADRO COMPARATIVO

Subject:	*Selection and qualificationof coolant*	
Component:	*Heat transfer fluid (coolant)*	
System:	*Converter and transformercooling system*	
Characteristics	**Antifrogen N**	**Amic Requimic-M**
Color	Pale yellow	**Amber yellow**
Antifreeze substrate	Monoethylene glycol (> 90%)	**Monoethylene glycol (96-97%)**
Anticorrosion additives	Organic and inorganic	**Organic (4-3%)**
Minimum concentration [Vol.-%]	20	**20**
Maximum concentration [Vol.-%]	65	**65**
Minimum operating temperature [°C]	-50	**-58**
Maximum operating temperature [°C]	150	**158**
Density at 20°C [g/cm³]	1,11 (DIN 51757)	**1,125 (DIN 51757)**
*Specific heat capacity at 20°C [kj/kg*K]*	2,4	**2,2**
*Thermal conuctivity at 20°C [W/m*K]*	0,29	**0,293**
Kinematic viscosity at 20°C [mm²/s]	20 (DIN 51562)	**23 (DIN 51562)**
Boiling point at 1013mbar [°C]	166 (ASTM D1120)	**170 (ASTM D1120)**
Freezing point at 50Vol.-% [°C]	-37 (ASTM D1177)	**-40 (ASTM D1177)**
Relative pressure drops at 20°C compared. to water at 10°C [rel. Unit]	1,4	**1,48**
Coefficient of cubic expansion at 20°C at 50Vol.-% [1/K]	0,00054	**0,00053**
pH-value coolant: water 1:2 [-]	8,5 (DIN 51369)	**8,0 at 25°C**
Specific electrical conductivity at 25°C coolant: water 1:2 [µS/cm]	2800	-
Reserve alcalinity [ml]	4 (ASTM D1121)	**4 (ASTM D1121, 11-2011)**
Surface tension at 20°C coolant: water 1:2 [mN/M]	34 (ASTM D1331)	**40**
Additives consisting of	-	-
Additives without	Nitrite	-
	-	-
	Amine	-
	Borate	-
	Silicate	-
	Phosphate	-
	CMR substances (cancerogenic, mutagenic,reprotoxic)	-

AMIC
SEGURIDAD INDUSTRIAL

CUADRO COMPARATIVO

Classification according toadministrative regulation (VwVwS 17.05.1999)	Water hazard class WGK 1 (slightly water-polluting)	Water hazard class WGK 1 (slightly water-polluting)
Officially approved according totechnical regulations for flammable liquids (TRbF 501 and 502)	Yes	Yes
Effectiveness of additives checked according toCorrosion test method ASTM D1384	Yes	Yes (05.2013)
Simulated service corrosion test of engine coolants ASTM D2570	-	-
Water pump cavitation test according ASTM D2809	-	Yes (ASTM D2809-4)
Cavitation test according ASTM D7583 JD	-	Yes (05.2016)
Hot surface aluminum corrosion test according toASTM D4340	-	Yes (ASTM D4340-19)
Foaming of engine coolants ASTM D1881	-	-
In accordance with EC-guideline 2011/65/EC Art. 4 §1 (RoHS 2) e.g., no lead, mercury, hexavalentchromium, polybrominated biphenyl (PBB), polybrominated diphenyl (PBDE)	Yes	Yes
In accordance with Regulation (EC) 1907/2006 Art. 3 Sec. 1-3 (REACH)	Yes	Yes
In accordance with ASTM D3306[1]	-	Yes
In accordance with ASTM D6210	-	Yes (ASTM D6210-17)
In accordance with ASTM D4985	-	-
In accordance with DAF 74002	-	-
In accordance with MTU MTL 5048	-	-
In accordance with TMC RP 364	-	-
In accordance with JIS K 2234	-	-

AMIC
SEGURIDAD INDUSTRIAL

CUADRO COMPARATIVO

In accordance with SAE J 1034	-	-
In accordance with BS 6580:2010	-	-
Certified quality system in production and quality control	DIN EN ISO 9001	-
Recommendations from cooling system supplier		
Minimum concentration [Vol.-%]	30	
Maximum concentration [Vol.-%]	50	
Additives without	Silicate	
Use of tap water for mixing the coolant.	No	
Mixing of different coolants	No	
Change interval of coolant.	According to coolant supplierinstructions	
Standards and regulations	Quality standard higher BS 6580	
[1] Standard specification for glycol base engine coolant for automobile and light-duty service		
Industry specification ASTM, BS, JIS		

AMIC
SEGURIDAD INDUSTRIAL