

Title (en)
Refrigeration lubricants.

Title (de)
Kältemaschinenschmiermittel.

Title (fr)
Lubrifiants pour la réfrigération.

Publication
EP 0406479 A1 19910109 (EN)

Application
EP 89119265 A 19891017

Priority
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Abstract (en)
A lubricant for hydrofluorocarbon refrigerant comprises as a main component an ester obtained by esterifying at least one straight or branched-chain monovalent fatty acid having a particular carbon number with neopentyl glycol or at least one compound of general formula (I) or a polyvalent alcohol of general formula (II) or further at least one polybasic acid having a particular carbon number: <CHEM> This lubricant has a sufficient compatibility with the hydrofluorocarbon refrigerant used as a refrigerant instead of the conventional chlorine-containing compounds.

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IPC 8 full level
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CPC (source: EP KR)
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Citation (search report)
• [X] US 3878112 A 19750415 - LUCK RUSSELL M, et al
• [X] US 4234497 A 19801118 - HONIG MILTON L
• [YD] US 4755316 A 19880705 - MAGID HILLEL [US], et al
• [X] US 4113642 A 19780912 - KOCH KARLHEINZ, et al
• [X] EP 0272575 A2 19880629 - HENKEL KGAA [DE]
• [A] US 4826633 A 19890502 - CARR DALE D [US], et al
• Industrial and Engineering Chemistry, Vol. 8, No. 1, March 1969, pages 70, 71, H.F. LEDERLE: "Complex esters of 2,2-dimethylhydracrylic acid", whole article.
• CHEMICAL ABSTRACTS, Vol. 96, No. 10, March 1982, page 169, Abstract 71653h, Columbus, Ohio, US; & JP,A,55 145 638 (NIPPON OILS AND FATS CO., LTD) 13-11-1980, whole Abstract.
• CHEMICAL ABSTRACTS, Vol. 102, No. 2, January 1985, page 166, Abstract 9492u, Columbus, Ohio, US; & JP,A,59 164 393 (NIPPON OILS AND FATS CO., LTD) 17-09-1984.

Cited by
EP0536940A3; US5728658A; EP0679809A3; US5531080A; EP0568349A1; EP0501440A1; US5964581A; US6029459A; EP0499994A1; US7052626B1; US5830833A; US5342533A; EP0445610A1; US5395544A; US5300245A; US5401433A; US5946921A; EP0518567A1; CN102292420A; US6080705A; US5547593A; AU680317B2; EP0622445A1; EP0786510A1; EP0638630A1; EP0629687A1; EP0449406A1; CN108138067A; US5494597A; AU715115B2; CN1072253C; US8419968B2; US7514394B2; US6245254B1; US8889607B2; EP0468729A1; GB2247466A; US5229025A; GB2247466B; EP0708173A1; EP0711820A3; EP1290114A4; US5575944A; AU666346B2; EP0786512A3; EP0445611A1; EP0448402A3; AU666346C; EP0738859A3; EP0738858A3; EP0743496A3; US5355695A; US5470497A; EP0498152A1; AU653572B2; US5486302A; US5612299A; WO2010056449A3; WO9212223A1; WO9324597A1; WO9314176A1; WO9513333A1; DE102020102162A1; WO2021152001A1; US6258293B1; US6582621B1; US5817607A; US5767047A; US5658863A; US5681800A; US6183662B1; US5833876A; EP0982393A1; US6296782B1; US5853609A; US6221272B1; EP0475751A1; US5202044A; EP0458584A1; US5211884A; EP0976816A3; AU2009314483B2; EP0644921B1; KR100349096B1; KR100240193B1; EP1941010A1; WO9310206A1; WO9324596A1; WO9201030A1; WO9416028A1; WO9311210A1; WO9325629A3; WO9324587A1; WO9413764A1; WO9325628A3; EP1129158B2

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KR 910003077 A 19910226; KR 950005694 B1 19950529; KR 970078831 A 19971212; KR 970078832 A 19971212; SG 49157 A1 19980518;
SG 49165 A1 19980518

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