

Title (en)  
Unleaded gasoline for direct injection gasoline engine

Title (de)  
Bleifreies Benzin für Direkteinspritzbenzinmotor

Title (fr)  
Essence sans plomb pour moteur à essence à injection directe

Publication  
**EP 0905217 A1 19990331 (EN)**

Application  
**EP 98850150 A 19980929**

Priority  
JP 28275397 A 19970930

Abstract (en)  
An unleaded gasoline for a direct injection gasoline engine contains an oxygen-containing compound having 2-15 carbon atoms in an amount in terms of oxygen atom of 0.1-15 mass % based on the total gasoline. The inventive unleaded gasoline exhibits enhanced durability of an engine due to the capability of reducing the amount of exhaust smoke and suppressing smoldering of a spark plug as well as the formation of deposit in a combustion chamber.

IPC 1-7  
**C10L 1/02; C10L 1/18; C10L 10/00; C10L 1/14**

IPC 8 full level  
**C10L 1/06 (2006.01); C10L 1/02 (2006.01); C10L 1/14 (2006.01); C10L 1/18 (2006.01); C10L 1/182 (2006.01); C10L 1/185 (2006.01); C10L 1/19 (2006.01); C10L 10/00 (2006.01); C10L 10/02 (2006.01); C10L 1/22 (2006.01); C10L 1/24 (2006.01)**

CPC (source: EP)  
**C10L 1/023 (2013.01); C10L 1/143 (2013.01); C10L 1/18 (2013.01); C10L 10/02 (2013.01); C10L 10/04 (2013.01); C10L 1/1824 (2013.01); C10L 1/1832 (2013.01); C10L 1/1852 (2013.01); C10L 1/1855 (2013.01); C10L 1/1857 (2013.01); C10L 1/1881 (2013.01); C10L 1/1883 (2013.01); C10L 1/19 (2013.01); C10L 1/1905 (2013.01); C10L 1/191 (2013.01); C10L 1/1915 (2013.01); C10L 1/1985 (2013.01); C10L 1/223 (2013.01); C10L 1/226 (2013.01); C10L 1/2283 (2013.01); C10L 1/238 (2013.01); C10L 1/2383 (2013.01); C10L 1/2425 (2013.01); C10L 1/2437 (2013.01)**

Citation (search report)  
• [X] WO 9523836 A1 19950908 - ORR WILLIAM C [US]  
• [X] WO 9404636 A1 19940303 - ORR WILLIAM C [US]  
• [X] WO 8701384 A1 19870312 - ORR WILLIAM C [US]  
• [X] WO 9533022 A1 19951207 - ORR WILLIAM C [US]  
• [X] US 4743273 A 19880510 - CROUDACE MICHAEL C [US], et al  
• [X] DE 4344222 A1 19950629 - VEBA OEL AG [DE]  
• [X] GB 2114596 A 19830824 - BRITISH PETROLEUM CO PLC  
• [X] US 3903251 A 19750902 - SIEG ROBERT P, et al  
• [X] FR 2367110 A1 19780505 - ANVAR [FR]  
• [X] US 5141524 A 19920825 - GONZALEZ FRANK [US]  
• [A] FR 2679918 A1 19930205 - COSMO SOGO KENKYUSHO KK [JP], et al

Cited by  
CN106085517A; NL1033228C2; CN110494534A; AU2002245281B2; CN111556890A; US2020339898A1; EP1341879A4; CN103194284A; GB2475785A; GB2475785B; FR3084373A1; GB2475783A; CN112920866A; US7704289B2; US6458176B2; US6468319B1; WO0234867A1; WO2020021070A1; WO03078553A3; WO0132809A1; WO2006052985A1; WO02062923A3; WO2018188982A1; US6447557B1; US8968426B2; US8231695B2; US8778034B2; US9562498B2; US6447558B1; WO2013023372A1; US6716258B2; US8663346B2; US8557001B2; US11130923B2; US9476004B2; WO0105912A1; WO0107540A3; EP2270119B1

Designated contracting state (EPC)  
DE FR GB

DOCDB simple family (publication)  
**EP 0905217 A1 19990331; JP 3948796 B2 20070725; JP H11106763 A 19990420**

DOCDB simple family (application)  
**EP 98850150 A 19980929; JP 28275397 A 19970930**