

Date: 2023-12-21

Dual-Fuel Methanol Engine Introduction

X52DF-M-S1.0, X62DF-M-1.0, X62DF-M-S1.0,
X72DF-M-1.0, X82DF-M-1.0, X92DF-M-1.0

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1 Introduction

WinGD presents its first methanol-fuelled engine, X-DF-M. Available for order now and with first engine delivery committed for early 2025, X-DF-M enables deep-sea ship owners and operators to harness near carbon-neutral renewable methanol in their main engines, powering the transition to sustainable shipping.

The high-pressure injection concept deployed in X-DF-M engines will be familiar to operators of the WinGD well-established, highly efficient diesel-fuelled X-Engines. Notable features include comparable performance with X-Engines in both methanol mode and diesel mode, low pilot fuel requirements precisely controlled through common rail injection, and NO_x Tier III compliance in both modes with Selective Catalytic Reduction (SCR).

Methanol is already a widely traded chemical with established port infrastructure and is easy to handle onboard as it does not require compression or refrigeration and is liquid under ambient conditions. Production capability for low-carbon and renewable methanol is being rapidly scaled up to meet the needs of industrial users, making methanol a viable option for meeting societal and corporate climate goals – at the same time minimising owner and charterer exposure to forthcoming carbon pricing.

2 Methanol technology

The engine operates according to the diesel principle in both diesel mode and methanol mode. The base engine is an X-diesel engine with an additional methanol fuel injection system. The diesel fuel injection system is used when the engine is running in diesel mode and to inject a small amount of pilot fuel in methanol mode. The pilot fuel injection is required to have an accurate ignition of the methanol fuel at all engine loads.

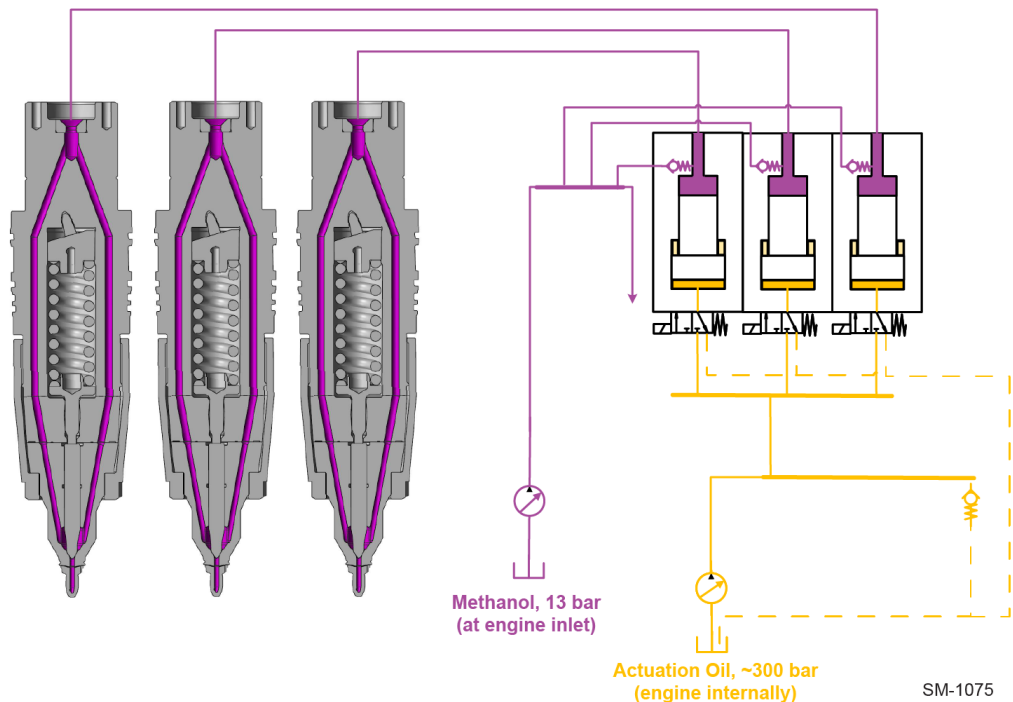


Figure 2-1: Methanol fuel injection system principle

3 Main engine parameters

The methanol engines have the same rating field as the diesel engines and will be available with the same cylinder configurations. The mechanical design is based on today's WinGD X-engine portfolio, with addition of the methanol fuel injection system including the additional servo oil system to drive it.

4 IMO Tier III solutions

The methanol fuelled engines can meet IMO Tier II NO_x levels in both diesel mode and methanol mode. Exhaust gas aftertreatment is required to meet IMO Tier III NO_x levels. SCR can be used for this. SCR can be located either upstream the TC turbine (high-pressure SCR) or downstream (low-pressure SCR).

5 Documentation availability

The schedule for the drawing and product documentation is presented in the Table 5-1 below. The 10X92DF-M-1.0, 6X82DF-M-1.0 and 5X52DF-M-S1.0 engines are contracted to date. The priority and schedules of the other engine types can change according to actual orders.

Table 5-1: Methanol engine development schedule

Engine type	MIM/MIDS	GTD*	Safety Concept	Full documentation set	Earliest expected first engine delivery date**
10X92DF-M-1.0	Available	Available	Q4/23	Q4/24	Q2/2025
6X82DF-M-1.0	Available	Available	Q4/23	Q1/25	Q3/2025
X62DF-M-S1.0***	Available	Q1/24	Q4/23	Q3/25	Q1/2026
X52DF-M-S1.0	Available	Q2/24	Q4/23	Q1/26	Q3/2026
X72DF-M-1.0***	Available	Q3/24	Q4/23	Q4/26	Q2/2027
X62DF-M-1.0***	Available	Q4/24	Q4/23	Q2/27	Q4/2027

* Preliminary performance data can be provided on request for engines where GTD is not available

** Indicative dates, to be confirmed by engine builder project specifically

*** Could be either X62DF-M-1.0, X62DF-M-S1.0, or X72DF-M-1.0 depending on market demand

The indicated documentation and engine delivery schedules are valid for the first contracted cylinder configuration. Other cylinder numbers will follow earliest four months later.

More available documentation can be found here:

<https://www.wingd.com/en/engines/engine-types/x-df-dual-fuel-methanol/methanol-documentation/>