

AkzoNobel Awlgrip HDT® topcoat

Comparative LCA against Awlgrip Topcoat (BAU) over the 20-year life of a 500 GT superyacht

1 INTRODUCTION

Awlgrip HDT is AkzoNobel's new-generation high-performance polyurethane sprayable topcoat, used above the waterline. AkzoNobel states it emits less VOC, needs less product (2 layers instead of 3) and lasts longer (24-month warranty instead of 18).

The study compares a 500 GT superyacht painted with Awlgrip HDT (Scenario 2) and with Awlgrip Topcoat, AkzoNobel's previous-generation topcoat that is still widely used (Scenario 1, BAU). Goal: verify HDT for Water Revolution Foundation's Hub if Verified Solutions.

2 METHODOLOGY

Functional unit. 1 m² of painted surface. Basis: 500 GT yacht with 2,500 m² of surface; 20-year life (per PCR).

System boundaries. Same for both. *Upstream*: raw materials of the three-part mix (base, curing solution, thinner or activator). *Core*: raw-material transport, mixing and filling, packaging, distribution.

Downstream: first coating and repaints (compressed-air spraying, diesel heating for drying, VOC, empty cans), paint removal after 20 years and incineration of the paint waste.

Standards. ISO 14040; ISO 14044 (incl. Amd 2, 2020); PCR Yachts and small crafts (2015, being updated); stages per EPD System GPI v4.0.

Impact methods. CML 2001 (GWP100, AP, POCP, EP, ODP, NOx, SOx, PM10); AWARE (water); ReCiPe 2016 (H) for Ecopoint.

Data sources. Primary data from AkzoNobel (data collection sheet, questionnaire, datasheets). Ecoinvent v3.9; SimaPro 9.5. No allocation. Exact product composition not provided: generic chemicals used.

Use and maintenance. Repainted over the old coat when the warranty ends: every 18 months (BAU) or 24 months (HDT), i.e. 14.33 or 10 coatings in 20 years. No energy in use. Coating energy and VOC values from AkzoNobel (table below).

BAU reference. Awlgrip Topcoat. Both mixed 1:1:0.25 by volume (base, curing solution, thinner; HDT: activator).

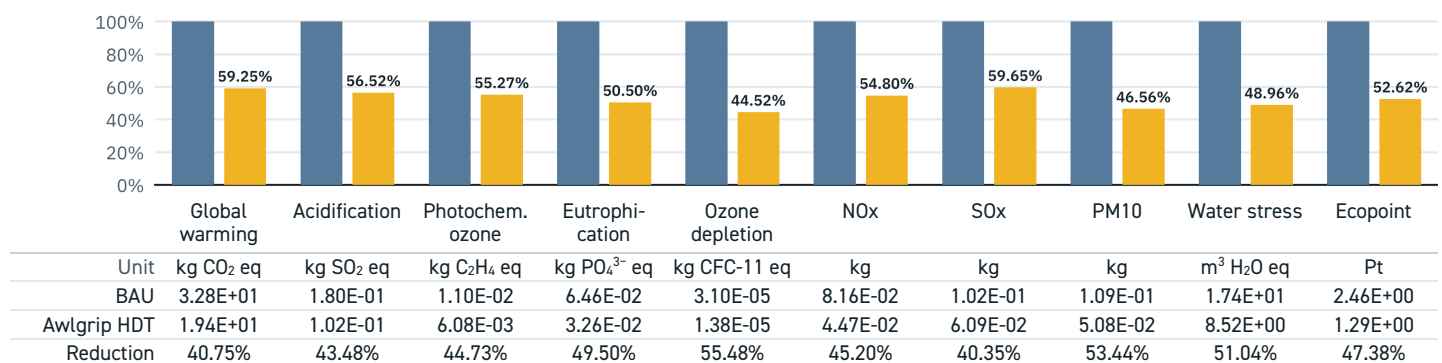
Left out. Epoxy primer (same for both), paint-removal energy (no data), HDT repairability, losses to water.

Not reported: author, report date, cut-off criteria, data quality results, uncertainty analysis.

3 RESULTS per functional unit (1 m² painted surface)

■ Scenario 1 – BAU (Awlgrip Topcoat) ■ Scenario 2 – Awlgrip HDT

Scenario 2 as % of BAU (BAU = 100%), report Figure 4

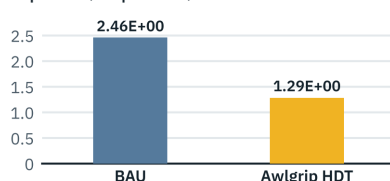


Sensitivity: reduction vs BAU, as printed in Tables 19–20. BAU raw-material impacts cut by 30% or 50%; HDT unchanged.

Raw mat. -30%	31.60%	43.48%‡	31.60%	43.29%	42.82%	38.98%	32.36%	51.16%	41.26%	43.48%
Raw mat. -50%	23.82%	29.68%	18.82%	38.24%	29.70%	34.03%	26.21%	49.21%	31.87%	40.63%

Bar labels as printed on report Figure 4. Base case: Tables 17–18. ‡

Ecopoint (Pt per m²)



Ecopoint by damage category

Pt per m ²	BAU	HDT	Reduction
Human health	2.35E+00	1.22E+00	47.85%
Ecosystems	4.59E-02	2.64E-02	42.49%
Resources	6.74E-02	4.44E-02	34.22%
Total	2.46E+00	1.29E+00	47.38%

Values as printed in Table 18.

Coating inputs (Tables 7 and 15, §2)

Per coating, 2,500 m ²	BAU	HDT
Paint mix	568 L	379 L
Electricity (spraying)	208 kWh	139 kWh
Diesel (drying heat)	2,000 L	2,000 L
VOC emitted	3.57E-01 t	1.59E-01 t
Coatings in 20 years	14.33	10

VOC content of the mix: 628 g/l (BAU), 420 g/l (HDT), from AkzoNobel.

Layout of report Figure 1, values from Table 18.

4 KEY FINDINGS

Awlgrip HDT is lower in all 10 indicators, by 40.35% to 55.48% (Table 17); Ecopoint by 47.38% (Table 18).

Fewer repaints and less paint. The longer warranty means 10 coatings in 20 years instead of 14.33, and each coating needs 379 L of mix instead of 568 L, with less VOC.

Where the impacts come from: raw materials and the energy and diesel used for painting dominate almost every category; PM is the exception (transport, per the report).

Keep in mind: both products are AkzoNobel's (the BAU is its previous-generation topcoat). Compositions were not provided, so generic chemicals were used; AkzoNobel says both are similar. Repaint intervals follow the warranties.

The gains hold in the sensitivity tests. With the BAU's raw-material impacts cut by 30%, HDT stays 31.6–51.16% lower; cut by 50%, 18.8–49.21% lower.

Conservative for HDT. Only the 24-month warranty is used, although AkzoNobel says HDT may last longer, and repairability is not credited. The report says HDT's impact could be lower still.