

Tack-Free Top Coat Oligomer



Tack-free gel polish top coats are highly desired in the nail coating industry because they provide a durable, high-gloss finish to a manicure without an IPA wipe step. Removing this step from the process saves time and allows the coating to exhibit its natural gloss. Like all nail coatings, tack-free top coats require a gloss finish, superior hardness, and most importantly, low yellowing properties.

Bomar has developed two model formulas using a new oligomer which provides exceptionally low color in a tack-free top coat. The new TPO-free model formula requires this new oligomer, a difunctional methacrylate monomer, a difunctional methacrylate co-oligomer, and a photoinitiator. The formula performed exceptionally well when compared to competitor top coats in areas of yellowness, gloss, and hardness.

Original Starting Point Formula:

Formula	Weight
BR-581MT	65.0%
DEGDMA	17.5%
IBOMA	15.5%
TPO	2.5%

*All materials are INCI listed

TPO-free Starting Point Formula:

Formula	Weight
BR-581MT	58.8%
DEGDMA	27.0%
BR-5413MB	10.8%
Phenylisopropyl Dimethicone	2.0%
TPO-L	1.5%

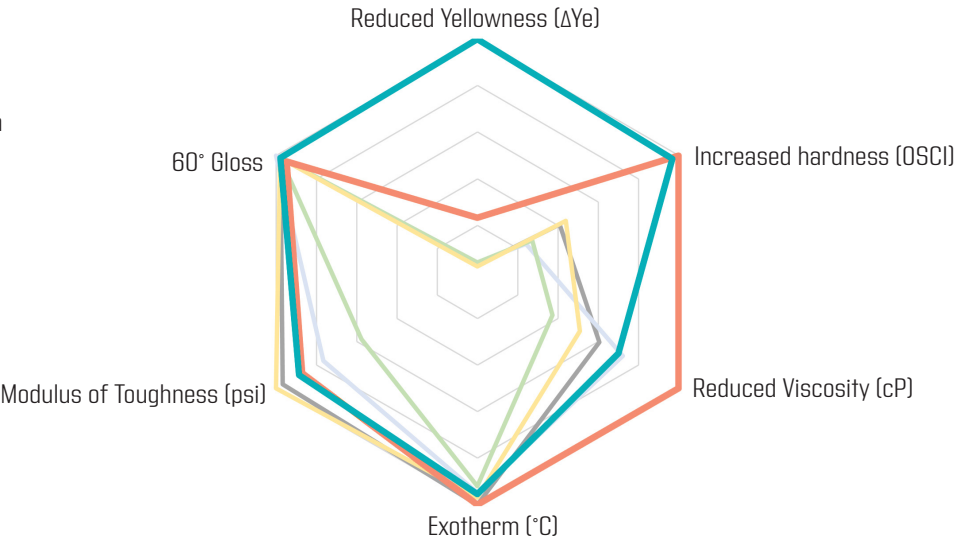
*All materials are INCI listed

- Superior hardness – durable and can withstand various conditions
- Excellent gloss – leaves nails with highly desired gloss finish
- Low yellowing – will not distort the color of the nail or polish underneath
- INCI listed ingredients – compliant with requirements for retail nail polishes
- Excellent shelf stability – shelf stable at temperatures up to 40°C

Formulators looking to develop a tack-free gel polish top coat should evaluate one of the model formulas and BR-581MT. Below is a table providing test results of the model formulations, including BR-581MT, alongside several highly ranked competitive tack-free top coats for comparison.

Competitor Comparison

- TPO-Free Bomar Model Formula
- Bomar Original Model Formula
- Competitor A
- Competitor B
- Competitor C
- Competitor D



Product	Viscosity at 25°C, cP ASTM D4287	Yellowness, ΔYe* ASTM E313		Gloss at 60°C** ASTM D2457	Acetone Double Rubs	Pendulum Hardness*** ASTM D4366		Exotherm, °C ASTM E2160	Modulus of Toughness, psi ASTM D882
Bomar TPO-Free Formula	1043	1.9 (30min)	-0.08 (24h)	95	113	39 (30min)	64 (24h)	50.5	1272
Bomar Original Tack-Free Formula	731	2.24 (30min)	0.43 (24h)	92	42	57 (30min)	66 (24h)	48.25	1250
Competitor A	1207	5.88 (30min)	3.57 (24h)	95	46	53 (30min)	27 (24h)	48.26	1390
Competitor B	1013	4.51 (30min)	2.52 (24h)	97	31	28 (30min)	16 (24h)	50.86	1098
Competitor C	1958	4.51 (30min)	2.46 (24h)	95	26	28 (30min)	18 (24h)	52.38	828
Competitor D	1433	8.50 (30min)	4.45 (24h)	95	14	54 (30min)	29 (24h)	49.75	1437

* Yellowness (ΔYe) calculated by BYK Spectro-guide. 10 mil wet drawdown done on BYK opacity card. Cured on Dymax® BlueWave® LED VisiCure® flood, 75 mW/cm² for 60 sec.

** Gloss calculated by BYK TriGloss meter. 10 mil wet drawdown done on BYK opacity card. Cured on Dymax BlueWave VisiCure flood, 75 mW/cm² for 60 sec.

*** Pendulum hardness completed on BYK pendulum hardness tester with Konig pendulum, 6" deflection, stop at 3" deflection, units in oscillations. 10 mil drawdown done on 4" x 3" glass slide. Cured on Dymax BlueWave LED VisiCure flood, 75 mW/cm² for 60 sec.