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 a model formula using a new oligomer which provides exceptionally low color in a tack–free top coat. The model formula requires this new oligomer, a trifunctional methacrylate monomer, a difunctional methacrylate monomer, and photoinitiator. The formula performed exceptionally well when compared to competitor top coats in areas of yellowness, viscosity, and hardness.

- 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

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

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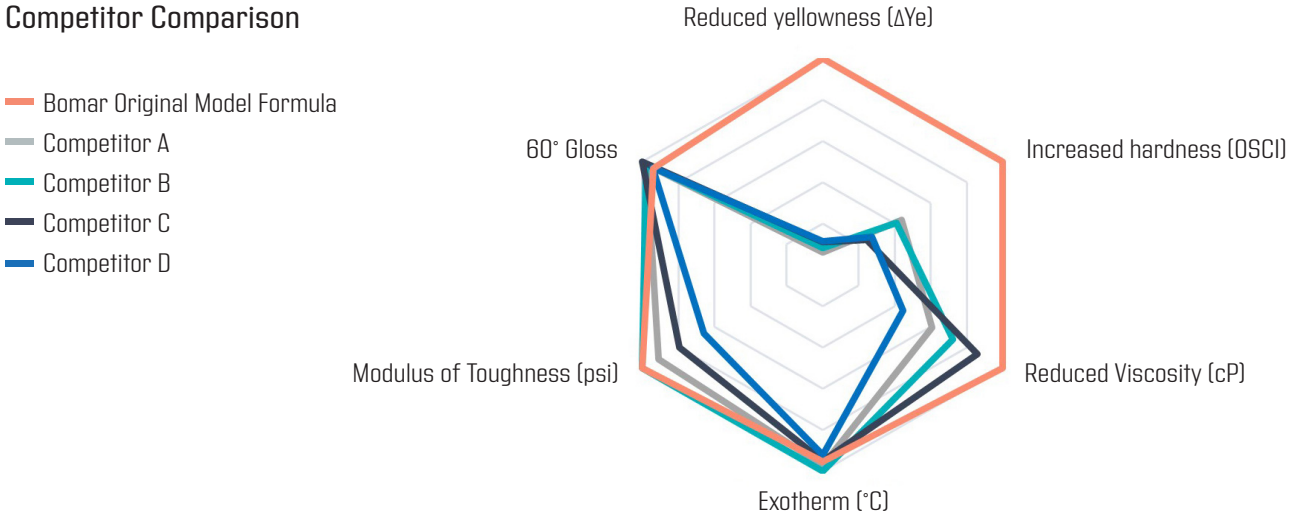
Formulators looking to develop a tack–free gel polish top coat should evaluate the model formula and BR–581MT. Below is a table providing test results of the model formulation, including BR–581MT, alongside several highly ranked competitive tack–free top coats for comparison. A normalized comparison is below with details for one competitor.

Competitor Comparison



Product	Viscosity at 25°C, cP ASTM D4287	Yellowness, ΔYe* ASTM E313		Gloss at 60°** ASTM D2457	Acetone Double Rubs	Pendulum Hardness*** ASTM D4366		Exotherm, °C ASTM E2160	Modulus of Toughness, psi ASTM D882
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.

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