

TECHNICAL BULLETIN

PRODUCT: POLYRAD FM12-15

POLYRAD FM12-15 is a multifunctional urethane acrylate/methacrylate oligomer designed to be used in many radcure applications. POLYRAD FM 12-15 is a hard oligomer that exhibits fast cure. It provides excellent adhesion to a variety of substrates, including porcelain, glass, polycarbonate, stainless steel, titanium, and most metal alloys. Excellent chemical resistance, high clarity and excellent scratch resistance characterize formulations based on POLYRAD FM12-15.

FEATURES:

- Fast cure response
- High hardness
- Excellent scratch resistance
- Excellent optical properties
- Good exterior durability
- Resistant to yellowing and other degradative effects from exposure to sunlight
- Excellent color retention
- Excellent adhesion properties

RECOMMENDED USES:

POLYRAD FM12-15 is a unique radcure oligomer recommended for abrasion-resistant protective coatings, adhesives, and inks. Applications include abrasion resistant protective finishes, automotive/transportation finishes, optical, and decorative applications. It is also recommended for any hard surface requiring abrasion resistance and chemical resistance.

PHYSICAL PROPERTIES:

| | |
|---------------------------------------|------------------------|
| Density (g/cm ³) | 1.1610 ± 0.0125 |
| Non-volatile, by weight | >99.9% |
| Molecular weight | 900 ± 30 |
| Viscosity (Haake RT20, 10 rpm @ 40°C) | 26000 ± 500 centipoise |
| Shrinkage (TGA @ 300°C) | < 1.0% |
| Color (APHA) | < 100 |
| Appearance | Clear, colorless |
| Free NCO (ppm on solids) | <0.1 max. |



TYPICAL FILM PROPERTIES:

Clear films were prepared by initiating with 0.5 parts by weight methylbenzylformate (MBF) and irradiating with UV energy at 1400-1500 millijoules/cm²:

| | | |
|-----------------------|-----------------|-----------------------------------|
| Tensile Strength | 9999 ± 250 psi. | |
| % Elongation | 8.0 ± 0.5% | |
| Pencil Hardness | 4H min. | |
| 60° Gloss | >88 min. | |
| MEK Double Rubs | >300 | |
| Cross-Hatch Adhesion: | | Scale: 0 = total adhesion failure |
| Porcelain | 5 | 1 = more than 75% failure |
| Stainless Steel | 5 | 2 = more than 50% failure |
| Copper | 5 | 3 = more than 25% failure |
| Titanium | 5 | 4 = up to 25% failure |
| Brass | 5 | 5 = no adhesion failure |
| Glass | 5 | |
| Polycarbonate | 5 | |

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