

HS-4

Weatherstrip Coating

Description:

HS-4 weatherstrip coating is a 3-component matt translucent solvent-based silicone coating system that thermally cures to form a resilient film. This coating system comprised a milky silicone base (HS-4A), an adhesion promoter (XC9615 is recommended for both on-line and off-line processing), and a catalyst (YC6831). A tin-free alternative catalyst is also available. The cured coating can help to provide substrate surfaces, such as EPDM rubber, with lubricating water repellency and easy release characteristics. HS-4 coating is an excellent candidate to consider for colored dynamic seals, such as automotive door seals or other parts where a smooth surface is preferred to impart low friction related noise generation. It can also be considered for numerous non-automotive applications such as O-rings and other small rubber parts as an assembly aid.

Key Features and Typical Benefits:

- Excellent freeze release characteristics
- Low Static / Dynamic CoF and smooth transition for low noise generation
- Excellent noise reduction properties
- Excellent adhesion to EPDM and other treated rubber types, such as TPE, NBR and SBR
- Fast heat cure process (approx.1 minute)
- Tin and Isocyanate free formulations are available

Typical Physical Properties:

| | HS-4 A | XC9615 | YC6831 |
|---|---------------|-------------------|-------------|
| | Silicone Base | Adhesion Promoter | Catalyst |
| Colour | Milky White | Colourless | Pale Yellow |
| Solids Content (%) | 27 | 15 | 28 |
| Density (@ 23°C) | 0.93 | 0.84 | 0.99 |
| Viscosity (DIN 4cup @ 23°C (seconds)) | 20 | 13 | 12 |
| Viscosity (mPas , Brookfield #2 @30rpm) | 550 | | |
| Solvent | Xylene | IPA | Toluene |

Note: Typical properties are average data and are not to be used to develop specifications.

Typical Cured Product Properties:

| Property | Test Method | Value |
|--|----------------|--------------|
| Coefficient of friction (Static & Dynamic) | DIN 53375 | < 0.3 |
| Abrasion Resistance (Crockmeter 900g load) | Dry Crockmeter | >500 cycles |
| Abrasion Resistance (Crockmeter 200g load) | Dry Crockmeter | >5000 cycles |
| Freeze Release | TL 523 45 | Pass |
| Repaintability | TSM 1701 G | Pass |
| Paint Staining | TSM 1701 G | Pass |

Note: Typical properties are average data and are not to be used to develop specifications.

Typical Cure Schedule:

Complete cure in any specific application is a function of coating thickness, part geometry and the heat transfer characteristics of the substrate to which the coating is being applied.

Although the prepared coating will cure at an ambient temperature, it is not recommended as the adhesion and full abrasion performance may not be realized. The recommended part temperature range at the point of application is 100-180°C to achieve the full coating performance. An absolute minimum part temperature of 80°C is possible in some applications. Higher substrate temperatures are preferred in order to achieve best adhesion and appearance of the coating.

| Part Temperature (actual, not oven set point) | | | | |
|---|----------|-----------|-----------|------------|
| Cure Temperature (°C) | 180°C | 150°C | 100°C | 80°C |
| Cure Time (at temperature) | 1 minute | 2 minutes | 5 minutes | 10 minutes |

Sample Coating System⁽³⁾ Preparation:

The following sample formulation is provided as a suggested starting point for spray applications.

| Component | Loading by Weight | |
|---|------------------------------|----------------------|
| HS-4 A | 100 parts | Supplied as 15L pail |
| XC9615 | 50 parts | Supplied as 15L pail |
| YC6831 | 7.5 parts | Supplied as 1Kg can |
| Diluting Solvent ⁽¹⁾ (if required) | 0 – 400 parts ⁽²⁾ | |

- (1) Compatible solvents include Hexane, Heptane, White Gasoline, Mineral Spirits and Toluene
- (2) Further dilution with a solvent may be desired according to the part temperature, type of substrate, required dry film thickness, and application method. The final formulation needs to be established by trials on the end user's production equipment.
- (3) Product formulations are included as illustrative examples only. Momentive makes no representation or warranty of any kind with regard to any such formulations, including, without limitation, concerning the efficacy or safety of any product manufactured using such formulations.

General Considerations for Use:

It is vitally important to thoroughly mix the HS-4A component to ensure any settled ingredients are well re-dispersed before use as settling of the matting agent and friction modifier can occur during storage. Once fully mixed (be sure that no sediment remains in the pail), the base is ready to use. Then add the solvent if required (see above). Finally add the catalyst (YC6831). The coating is now ready to use.

NOTE: The order of addition is important.

The bath should be kept under constant agitation to prevent settling of the active powders and to ensure maximum bath life. For best results, the substrate should be clean and dry and have a minimum temperature of 100°C, as lower application temperatures can adversely affect the adhesion and appearance of the coating. In general, higher temperatures of 200°C or higher will not affect the coating and may actually lead to productivity gains.

Typical bath life is 12 hours in a partially closed container. **Do NOT completely close the container.** Continuous slow speed agitation of the coating bath is recommended to reduce the possibility of settling of the matting agents and friction modifiers.

For optimum coating adhesion and performance, ensure all surfaces are clean and dry before applying the coating solution. The substrate temperature at the time of coating should be between 100 – 230°C for on-line application; and a minimum of 100°C for off-line applications, including drum/tumble coating where a suitable drying schedule must be used between each application.

HS-4 weatherstrip coating is recommended to be spray coated. This coating is typically applied using HVLP spray guns with an aircap diameter < 1.0mm. To avoid blocking of the guns the coating should be filtered through a 200 micron mesh after the coating is prepared. It is good practice to install a further 200 micron mesh filter between the holding tank and spray guns. Most on-line applications use multiple spray guns to achieve even coverage of the profile during extrusion.

It is important to apply sufficient material to achieve an initial wet look to help ensure continuous coverage and good coating adhesion. Again, it is possible to employ multiple spray heads in tandem to help ensure sufficient coating is applied and no areas are left uncoated during the application process.

The resulting coating thickness will depend on the application method and the required end-use requirements. Dry film thicknesses are typically between 6 and 10 microns, with 8 microns recommended for optimum performance.

Packaging:

| | |
|---------|----------------------------|
| HS-4: | 15 Litre metal pails |
| XC9615: | 15 Litre pails (14Kg fill) |
| YC6831: | 1Kg metal cans |

Patent Status:

Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

Product Safety, Handling and Storage:

Customers should review the latest Safety Data Sheet (SDS) and label for product safety information, safe handling instructions, personal protective equipment if necessary, emergency service contact information, and any special storage conditions required for safety. Momentive Performance Materials (MPM) maintains an around-the-clock emergency service for its products. SDS are available at www.momentive.com or, upon request, from any MPM representative. For product storage and handling procedures to maintain the product quality within our stated specifications, please review Certificates of Analysis, which are available in the Order Center. Use of other materials in conjunction with MPM products (for example, primers) may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

HS-4 weatherstrip coating components have a shelf life of 24 months from date of manufacture when kept in the original unopened containers under suitable storage conditions (<43°C).

Limitations:

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.



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