

General Information – Coating Mixing

Scope	<ul style="list-style-type: none"> - INX Coatings and Adhesive's coating products are formulations comprised of multiple ingredients, some of which vary in molecular weight and may result in stratification/phasing in the coating container as the product ages post-manufacturing. - To ensure predictable and repeatable results for the coating product which adheres to the intended characteristics, it is important that coatings are mixed prior to use and in most cases agitated continuously during production use. - This is particularly important when using specialized formulations that are intended to meet very specific performance criteria for the final applied film. - Mixing and agitation will ensure that the product in the coating container and coating system is homogenous and contains all necessary ingredients in the formulated proportions/concentrations. - Failure to mix the coating product sufficiently prior to use can result in poor and/or unintended product performance during both application and on the final applied film.
Mixing Equipment	<ul style="list-style-type: none"> - It is important that the mixing and agitation equipment being used is suitable to achieve and maintain a homogenous condition for the coating product in the supplied container. - Examples of recommended mixing equipment are: <ul style="list-style-type: none"> • Drum: 0.75 - 1.5 HP pneumatic or electric mixer with (2) 4-5" propellers (3-Blade Square Pitch*) • IBC Tote: 1.0 - 1.5 HP pneumatic or electric mixer with (2) 6" propellers (3-Blade Square Pitch*) • Pail: 0.5 - 1.0 HP pneumatic or electric mixer with (1) 3-4" propeller (3-Blade Square Pitch*) • Hand-Held: Drill with mixing blade/paddle attachment that is suitable for grout/thin-set applications – can be sourced from most hardware/home improvement stores <p>(*) Alternative impeller options may be available by mixer manufacturer</p> - Drum/Tote Mixers can be sourced from the following companies – other sources are available: <ul style="list-style-type: none"> • INDCO – www.indco.com • Graymills – www.graymills.com • EvenMix, – www.evenmix.com • Grainger – www.grainger.com <p>For assistance in making mixer recommendations, contact your INXCAC Technical Sales Representative</p>
Pre-Mixing	<ul style="list-style-type: none"> - Prior to using any coating product, the product should be pre-mixed thoroughly in the supplied coating container prior to checking viscosity and circulation for production use. - If transferring coating from a supplied container to a secondary container for production use, the coating should be mixed in the supplied container prior to transferring/decanting into the secondary container – an example would be transferring from an IBC tote into a press-side drum/pail. - Pre-mixing should be thorough to achieve a homogenous product result in the supplied container: <ul style="list-style-type: none"> • For mixing systems that have variable speed control, the speed of the mixer should be operated so as not to create a vortex around the mixer shaft at the coating surface. • Creating a surface vortex will introduce un-wanted air into the coating liquid which can negatively impact a viscosity measurement and/or overall coating performance – avoid aerating the coating by over-mixing. • Mixer speed should be adjusted to a rate to create sufficient agitation without creating a vortex – the mixer rate should create coating movement at the surface. • Good judgement should be used when determining how long to mix the coating prior to use, however, a general rule of >20 minutes will ensure that the product is homogenous and suitable for use.
Agitation	<ul style="list-style-type: none"> - When using a mixing system that allows for constant agitation during production/use of the coating, care should be taken to not over-agitate the coating particularly as the coating volume is consumed and the mixer propellers become located near the coating surface.

- Un-like pre-mixing prior to use, agitation during production/use does not require the mixing speed necessary to make the product homogenous – a slow agitation is employed to maintain coating movement in the container which aids in the removal of entrained-air that is returned from the coating-unit.
- Air introduction into the coating during application/circulation by anilox/chambered systems and pan return drains must be managed for removal to avoid excessive air/foam build-up in the coating liquid.
- Slow agitation of the coating will help to move entrained air-bubbles to the coating surface for dissipation and avoid excessive coating aeration/saturation.
- Excessive agitation of the coating liquid during production/use can aerate the coating liquid, particularly when a vortex is created by excessive mixer speed, or the mixer propeller is located at the coating surface.
- As the coating volume is consumed, the mixer should be stopped when the lowest mixer propeller is located at/near the coating surface to avoid problems of introducing air into the coating, or over-mixing entrained air located at the coating surface into a foam.
- When the lowest propeller is at/near the coating surface, the mixer should be stopped, and the remainder of the coating container should be consumed without use of the mixer.
- If it is determined that the remaining coating is problematic due to aeration/entrained air/foam, the coating should be discontinued from use and replaced with a fresh container.

Over-Agitation

- Over-agitation of the coating during production/use can result in contamination by excessive entrained air and foaming to occur.
- The results of excessive entrained air-bubbles and foaming of the coating product can be:
 - Elevated viscosity
 - Poor pumping/circulation
 - Chamber starvation
 - Activation of flow and level sensors of the coating unit
 - Over-flow of the coating pan/recovery pan
 - Insufficient coating application/coat-weight to the coating blanket/plate and substrate
 - Poor coating leveling/flow-out
 - Pin-holes/voids in the applied coating film
 - Insufficient or varying gloss results
 - Unpredictable COF/AOS results
 - Poor coating barrier characteristics
 - Streaks/voids in the applied coating film
 - Insufficient film cure - UV coatings
 - Ink back-trap/accumulation on the coating blanket/plate
 - Coating misting/slinging with anilox/chambered systems
- Coating that is determined to be over-agitated/aerated and saturated by excessive entrained air/foam should be discontinued from use and replaced with a fresh coating container.
- If excessive mixer speed is the cause of the over-agitation, the mixer speed should be reduced or discontinue use if the minimum speed is determined to be excessive.
- Coating containers that have been determined to contain excessive entrained air/foam should be set aside and the air-bubbles allowed to dissipate completely prior to re-use.
- Dissipation of the entrained air-bubbles could take days depending on the extent of the contamination/saturation.
- While there may be no evidence of large air-bubbles being present on the coating surface, the observation of small pin-sized bursts on the coating surface is an indication that air saturation still exists.
- Consolidation of contaminated partial coating containers into a single volume can cause the dissipation time to become extended.