

MICROSTAR® HS™ INVESTMENT

THE BASICS OF EXPANSION & FIT

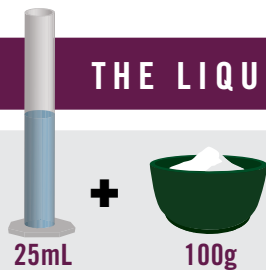
TIPS FOR GETTING GREAT RESULTS FROM YOUR INVESTMENT

This document is intended to provide a basic overview of expansion and fit with Microstar® HS™ Investment. With the many different types of restorations available today, it is especially important to be able to accurately and precisely control the expansion of your investment.

If you have any questions about this document, please call our Technical Department at (800) 243-2000.

[less expansion ← high noble casting -- ceramic pressing -- noble casting -- non precious casting → more expansion]

THE LIQUID-TO-POWDER RATIO



The liquid-to-powder ratio dictates **how much solution** (water + HS™ Expansion Liquid) should be mixed with the investment powder. This ratio is fixed at 25mL of solution per 100g of powder. Distilled water is highly recommended.



Background:

Microstar® HS™ Investment is a universal investment suitable for a wide variety of applications from all-ceramic pressing to non-precious alloy casting. It also gives technicians the freedom to choose between the rapid and overnight techniques, as well as the ring and ringless techniques. With over a decade of successful results, HS™ Investment truly is the versatile and proven investment for the modern laboratory.

THE EXPANSION LIQUID-TO-WATER RATIO



The expansion liquid-to-water ratio determines the **amount of expansion**. A stronger concentration of HS™ Expansion Liquid will yield greater expansion and, for extra-coronal restorations, a fit that is less tight. For maximum expansion, use 100% expansion liquid.

Similarly, a weaker concentration will provide less expansion and a tighter fit. The final solution may be diluted down to 50% HS™ Expansion Liquid and 50% water. Additional dilution is not recommended except when casting with metal rings.

RECOMMENDED EXPANSION LIQUID-TO-WATER RATIOS

APPLICATION		Expansion Liquid (mL)	Distilled Water (mL)
Pressing	All-Ceramic	17	8
	Press-To-Metal®	17	8
	Press-To-Zirconia	17	8
	Veneer	17	8
Casting	High Noble Alloys	14	11
	Noble Alloys	17	8
	Base Alloys	25	0

*Exact ratios will vary from lab-to-lab.

Note:

MOST EXPANSION LIQUIDS ARE NOT FREEZE STABLE.

Some manufacturers add anti-freeze agents to lower the freezing temperature slightly. These additives decrease the accuracy and consistency of the expansion. Therefore, HS™ Expansion Liquid is supplied only in its pure form.



Jensen Recommends

Overnight burnouts should not have a **climb rate** of more than 14°F per minute.

max **14°F** per min.

ADJUSTING FOR THE OVERNIGHT TECHNIQUE

The majority of an investment's setting expansion is achieved in the first hour after mixing. With the rapid burnout technique, however, this setting expansion is halted early when the ring is placed into the burnout furnace.

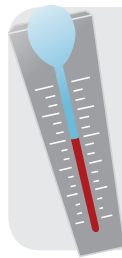
Due to the popularity of the rapid technique, the ratios listed on the previous page are for this technique. When using the *overnight* technique instead, **decrease the amount of expansion liquid by 10%**. This will compensate for the fact that the overnight burnout allows for more setting expansion.

UNDERSTANDING THERMAL EXPANSION

In addition to setting expansion, investments also exhibit thermal expansion. This expansion is achieved by most phosphate investments at approximately 1350°F. This temperature must be attained to give consistent expansion results.

In the case of type III and IV gold alloys, which benefit from reduced porosity when cast at lower temperatures, the ring may be placed into a preheated furnace at 1500-1600°F, held at temperature for 30 minutes, then allowed to drop to a more ideal range of 1000-1200°F. This yields a consistent fit with maximum casting density. The reduction in temperature does not reduce the expansion of the investment.

THE ROLE OF AMBIENT TEMPERATURE



68-74°F

As with many materials in the laboratory, the ideal temperature for investment materials is "room temperature" from 68-74°F. Significantly higher or lower temperatures will affect setting times. Avoid storing expansion liquid in a refrigerator, as this will reduce its consistency.

Special Tip

For more expansion, the mixing time can be increased to 90 seconds, or even 120 in extreme situations. Note that this will reduce the working time.

