



## “High Mobility Greases—Valvoline Cerulean #0 and Palladium #0”

### Introduction

Valvoline HD is proud to announce the introduction of High Mobility Cerulean and Palladium #0. These products are ideal for inventory consolidation. The high mobility (HM) products are new and improved formulations of the products previously offered in #0 and #00 grades. The HM property of the #0 covers the mobility range of #0, #00 and #000 to reduce the total number of SKUs required while maintaining excellent extreme pressure (EP) performance and load carrying capabilities. These lighter grease grades are frequently used in gear boxes requiring a semi-fluid, auto-lube grease systems and environments where arctic conditions are experienced or pumpability is a concern.



### A Closer Look at the Technology Behind the Products

The National Lubricating Grease Institute (NLGI) has defined 9 different consistency ranges of grease in terms of hardness as outlined in ASTM D217 Worked Penetration. These are illustrated in **Figure 1**. To achieve a given consistency, many variations of thickener and base fluids can be used. In addition to other additives, such as tackifiers, this combination determines the overall mobility, or pumpability, of a grease.

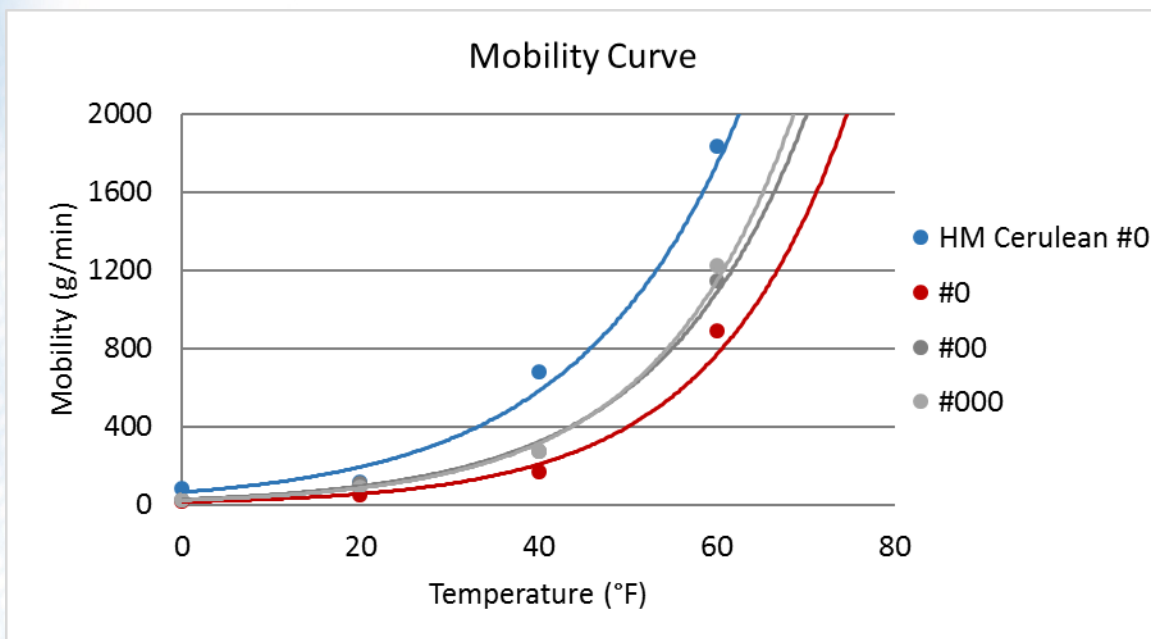
NLGI Number	Worked Penetration at 25°C (Tenths of a Millimeter)	Relative Appearance
000	445 to 475	Semi-Fluid
00	400 to 430	
0	355 to 385	↓
1	310 to 340	
2	265 to 295	Butter-like
3	220 to 250	
4	175 to 205	↓
5	130 to 160	
6	85 to 115	Hard

Figure 1: NLGI consistency grades as defined by ASTM

mobility, or pumpability, of a grease. In formulating the Valvoline HM greases, the K22680 Grease Mobility Test Apparatus was used to perform grease mobility tests per the US Steel Method at various temperatures to help predict pumpability characteristics of different grades.

To determine the ideal pumpability range for the Valvoline HM greases, the typical flow rate of greases for the grades in question were examined. To obtain the data shown in **Figure 2**, at

the top of the next page, the amount of thickener and combination of base fluids in the standard Cerulean formulation (available in #1 and #2) was modified to manufacture four different greases: NLGI #0, #00, #000, and HM #0. The pumpability of these formulations were tested at 0, 20, 40 and 60°F, which resulted in the Mobility Curve displayed. The mobility of HM Cerulean exceeded that of the #0, #00 and #000 formulations at each test temperature. The mobility of HM Palladium will correlate to that of HM Cerulean.



**Figure 2:** Mobility Curve comparing the pumpability of HM Cerulean #0 to the typical pumpability of #0, #00 and #000.

For HM Cerulean and Palladium to cover the mobility range displayed and maintain #0 consistency, a different base oil combination was required in comparison to the traditional formulations. In modifying the formulation, EP performance, as tested by the Four-Ball EP Weld test and the Timken test, was maintained at 500 kg and 60 lbs., respectively.

### Conclusion

The proven performance of Valvoline Cerulean and Palladium greases, available in #1 and #2, is now available in a High Mobility #0 formulation to cover applications requiring a #0, #00 and #000. Designed with inventory consolidation in mind, these products reduce the total number of SKUs required, while delivering premium performance and protection. Valvoline HM Palladium and Cerulean can be used in a variety of applications, including gear boxes requiring a semi-fluid, auto-lube grease systems, arctic conditions, systems requiring a highly mobile product, and applications that call for #0, #00 and #000 grease.

Part Numbers – Valvoline HM Palladium 3% Moly #0		Part Numbers – Valvoline HM Cerulean #0	
35 Lb. Pail	881220	35 Lb. Pail	881217
120 Lb. Keg	881234	120 Lb. Keg	881218
400 Lb. Drum	881235	400 Lb. Drum	881219