

Outstanding abrasive wear test results on austenitic stainless steel after SuperExpanite Surface Hardening.

Abrasion wear is an extensive problem for stainless steels. In the on-going effort to increase the knowledgebase on abrasion, Expanite requested Bud Labs to measure the dry abrasion characteristics of untreated and Expanite treated samples of austenitic AISI316L using the ASTM G 65 Procedure.

The ASTM G 65 Procedure is a standard test method for measuring abrasion using the dry sand/rubber wheel apparatus where weight loss is used as indicator for the wear resistance; the less the better.

The results are indisputable: The 316L with SuperExpanite is more abrasion resistant than the untreated sample approximately reducing abrasive wear by more than 60%.



The table below lists the observed weight losses and thereby the reduction on an Expanite hardened sample:

Description	Initial Weight (g)	Final Weight (g)	Mass Loss (g)	Wheel Diameter:					
				Density* (g/cm ³)	Volume Loss (mm ³)	Start	Finish	Loss (in)	AVL (mm ³)
316	160,0465	159,9784	0,0681	7,68	8,87	8,921	8,921	0,000	8,95
316 w/ SuperExpanite	165,3589	165,3365	0,0224	7,68	2,92	8,921	8,921	0,000	2,94

* Assumed density

Not just a coating

The Expanite treatment effectively removes the oxide film covering stainless steels. This allows controlled incorporation of carbon and nitrogen atoms in the underlying metal. The hardened layer is characterized by an expansion of the material structure. We call this zone expanded austenite, expanded martensite, or simply, Expanite.

With the Expanite process it's possible to increase the surface hardness of stainless steels by up to 10 times, while maintaining or even enhancing corrosion resistance. This method is considered unique since it's suitable for austenitic-, ferritic-, martensitic and duplex stainless steels. Parts can be treated with extremely short lead times—a few days—which is previously unseen within surface hardening of stainless steel.

The Expanite technology can significantly increase the value of products across many industries—from knives, valves, mixers, and grinders for the food industry, to pumps and extruder screws, or injection parts for the automotive sector, as well as screws, bolts, and washers.

At its core, Expanite offers 3 different processes, each of which can be optimized according to customers' requirements in terms of abrasion, galling, corrosion and scratch resistance. This means that Expanite can develop and customize solutions for a wide variety of companies and industries.

Expanite

Expanite was founded in 2010 by three scientists from The Technical University of Denmark. Expanite is based in Hillerød, Denmark, has a treatment facility located in Twinsburg, Ohio and Expanite recently opened a treatment center in Frickenhausen, Germany. For further information, please contact Thomas Abel Sandholdt, CEO at Expanite, +45 2040 7207, or check our website: www.expanite.com.

