



New and Innovative Additives

Innovative Extreme Pressure (EP) Additives & Solutions

2017 STLE Commercial Forum 2B

May 22, 2017 at Atlanta, GA

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Novitas Chem Solutions, LLC



***Novitas strives to
provide innovative
solutions to the
lubricant industry***

innovate with quality

Novitas Lubricating Specialties Products (SP)



 ***Partner for your
Innovations***

SP-1901
SP-1903

PE-501
SE-601
SE-701
LCO-801/901
EP-2301S

SP-3211
SP-3111
SP-3903

SP-4102
SP-422D
SP-4002
SP-4004

AP-6009
SP-7001
SP-422D

SP-SVI
SP-PUGT



Product Overview/Summary

AW/Antiwear

AW-3001: TPPT
AW-3111: OP Booster
AW-3160: Amine Phosphate
AW-3211: FZG Booster
AW-3305: OrganoPhosphate

AO/Phenolics

AO-1008: Liquid Phenolics
AO-1115: S-Phenolics

CI/Oil Based

CI-4102 Neutral Ca
CI-4208: Cu passivator
CI-4309: TTZ Oil based

Synthetic Hydrocarbon

PAO-40a
PAO100a
AN-23

FM/Lubricity Improver

BE-318: Lubricity Ester
SE-601: Oil based Polymeric Ester
SE-701: Water based Polymeric Ester
FM-5104: MoDTC
FM-5208: MoDTP

AO/Aryl Amine

AO-1218: Solid DPA
AO-1308: Alkylated PANA

CI/Water Based

CI-4002: Tri-Acid
CI-4004: Proprietary
CI-4308 - TTZ water based

Synthetic Oxygenates

BE-Biodegradable Ester
SE-Specialty Ester
HSE-High Stability Ester

EP/Extreme Pressure

PE-501: P based
SP-801/901: Sulfur Based
EP-2301S: P/N Based
EP-2808: OrganoPhosphite
EP-2901: S/N Based

AO/Blends

AO-1901: S/N Blend
AO-1904: AO Blend

SP/Special Products

SP-6003FG: Food Grade Package
SP-6009: EP Package
SP-422D: 400TBN Ca

PolyalkyleneGlycol

Water Insoluble (WI Series)
Water Soluble (WS Series)
SVI PAG (LF Series)



ProductName	Registration No.	Code
Novitas 1115	153177	HX-1
Novitas 1248	151710	HX-1
Novitas 1300	151038	HX-1
Novitas 1904	153176	HX-1
Novitas 3160	150180	HX-1
Novitas TPPT	149270	HX-1
Novitas 3004	149338	HX-1
Novitas 4000	153989	HX-1
Novitas 4309	150207	HX-1
Novitas 4501	154067	HX-1
Novitas 4502	154068	HX-1
Novitas 2808	153525	HX-1
Novitas 7001	155203	HX-1
Novitas 7002	154577	HX-1
Novitas WI 1715	151037	HX-1
Novitas WI 625	151709	HX-1
Novitas WS 3520	155165	HX-1
Novitas WS 5100	149337	HX-1
Novitas WS 660	151073	HX-1

PANA (Others)

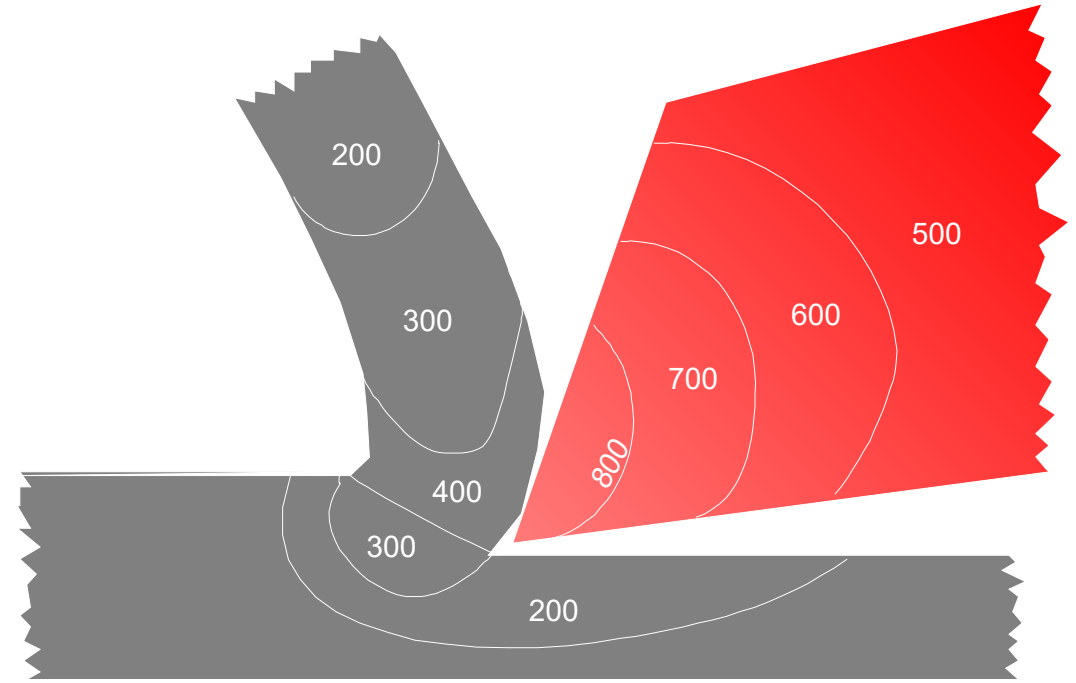
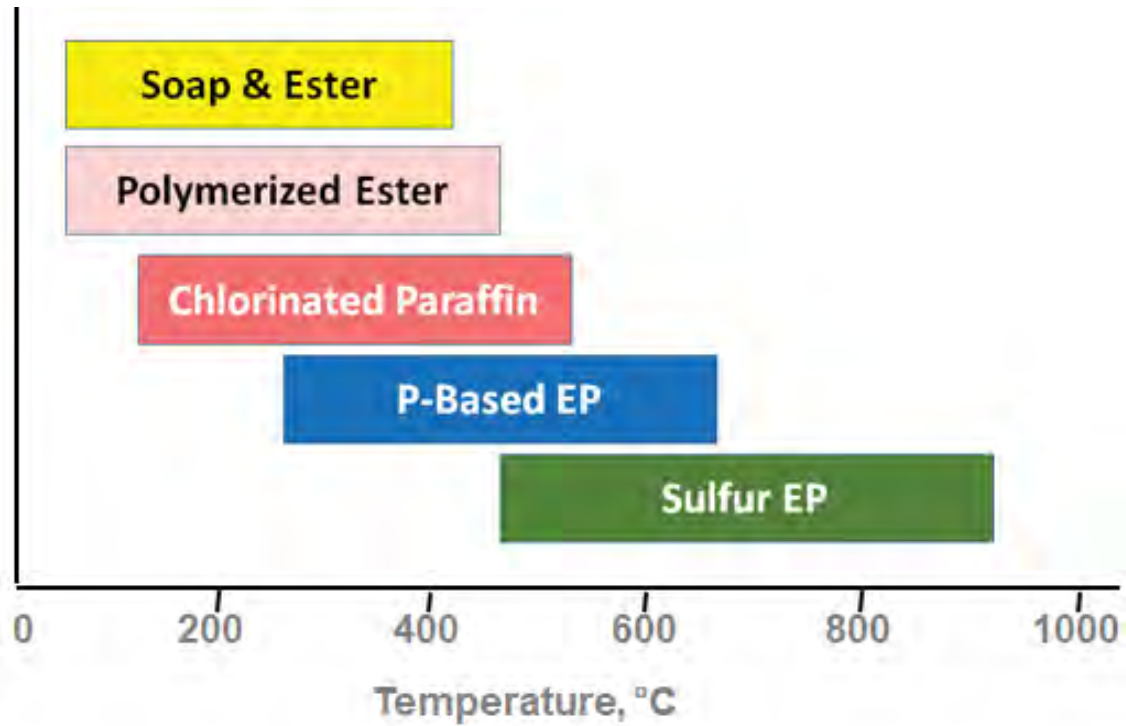
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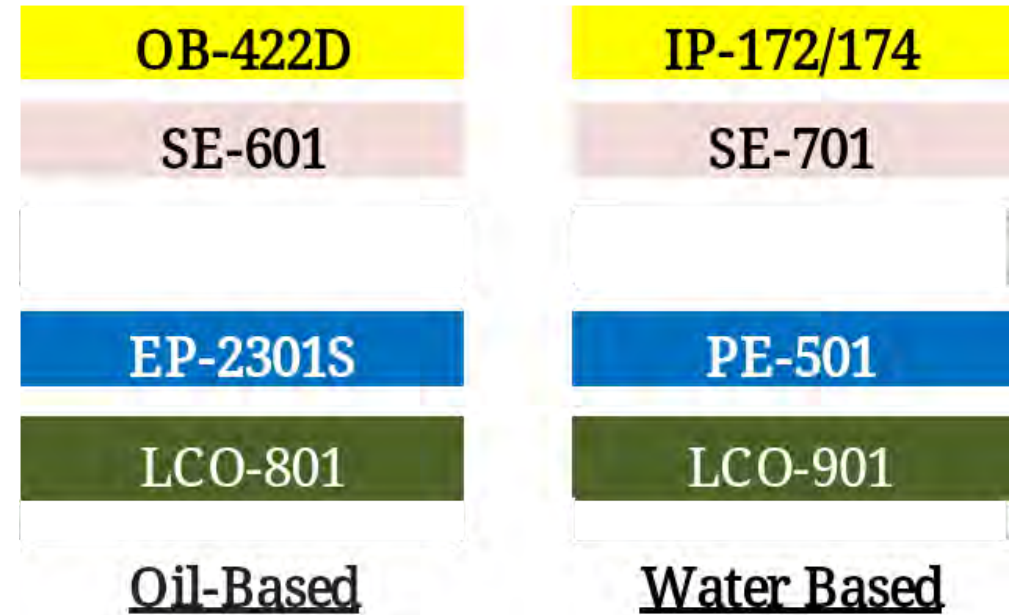
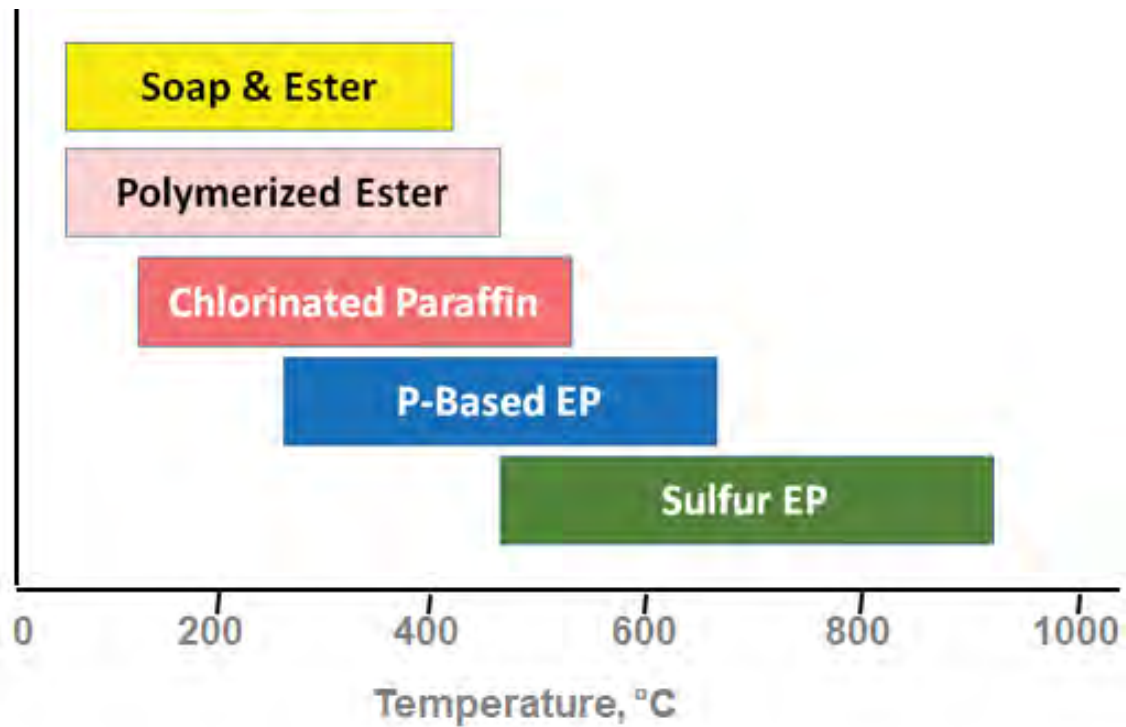
*HX1, Kosher Certified

Quality you can count on





**Metalworking Operations @ Cutting Points under load/sliding conditions
EP additives are required to cover a wide temperature Range Requirements**



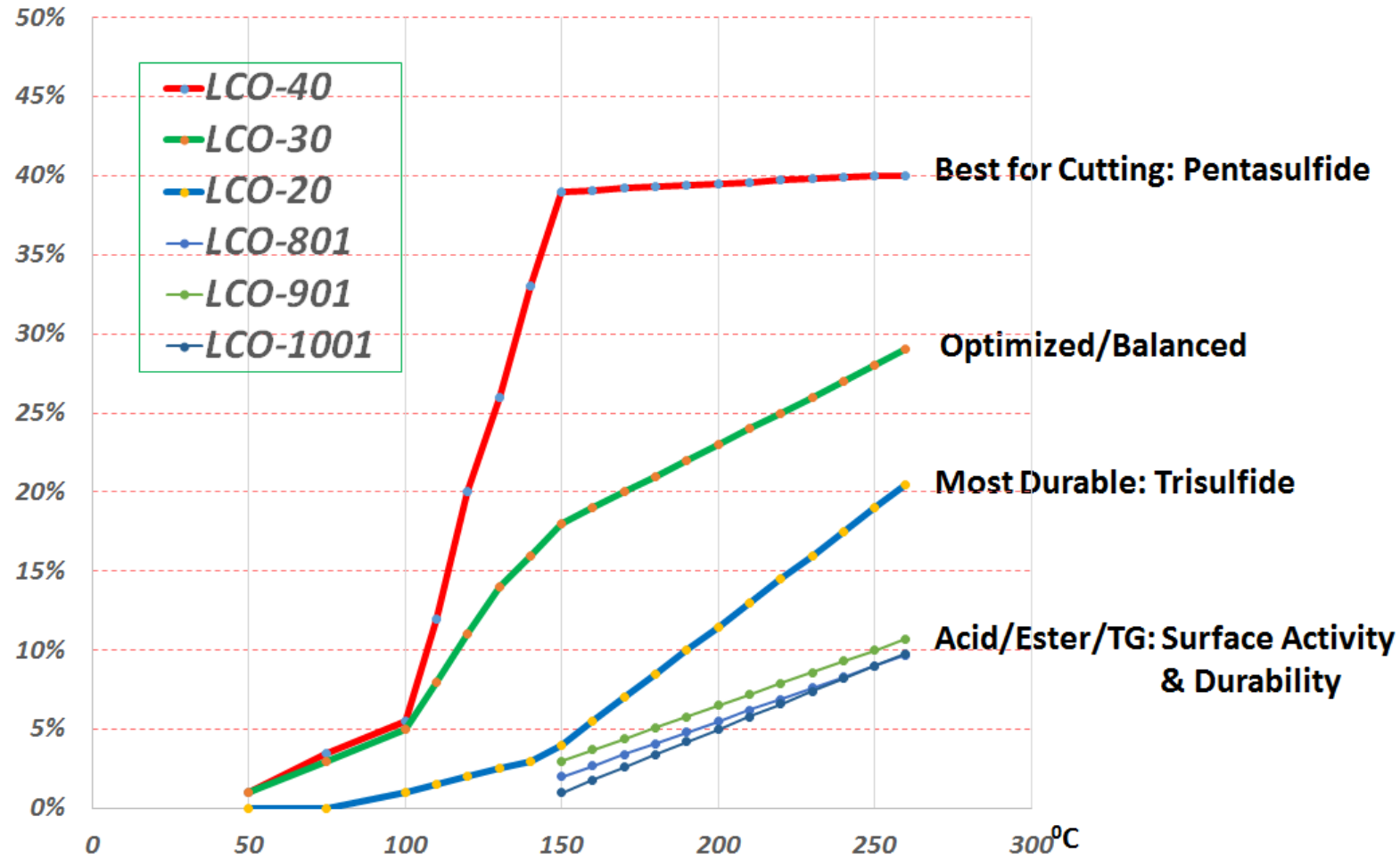
Novitas offers EP for Oil based and Water Based Solutions



Innovative Sulfur Based EP Additives

Product Name	Back bone	Activity	Total S %	Active S%	Vis, cSt	Copper Strip
			%	@150C	@40C	@100C
LCO-40	HC	Active	40%	100%	50	4C
LCO-30	HC	Active	30%	60%	15	4C
LCO-20	HC	Inactive	20%	20%	50	1B (3H)
LCO-801	Ester	Inactive	10%	20%	Liquid	1B (3H)
LCO-901	Acid	Inactive	10%	30%	Solid	1B (3H)
LCO-1001	TG	Inactive	10%	10%	1,000	1B (3H)

Figure 1 – Longevity Performance versus Poly-sulfide chain length

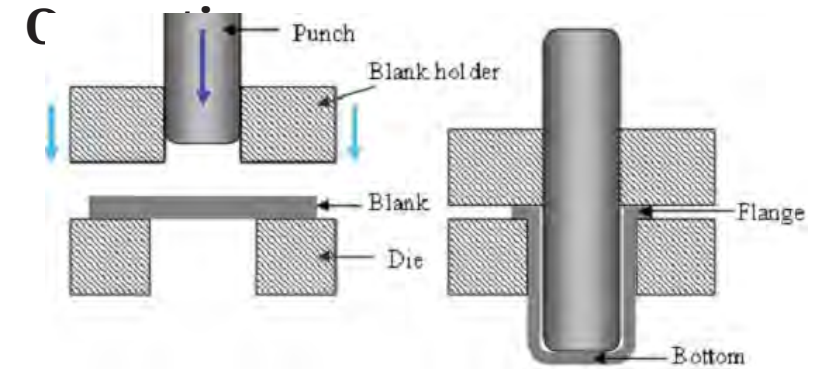


EP-2301S: P-based EP Additive

- ✓ EP-2301S: CLP Replacements
- ✓ Excellent EP
- ✓ High Load Wear Index
- ✓ Improved/Good Oil Solubility
- ✓ For Oil-based Industrial & MWF Applications

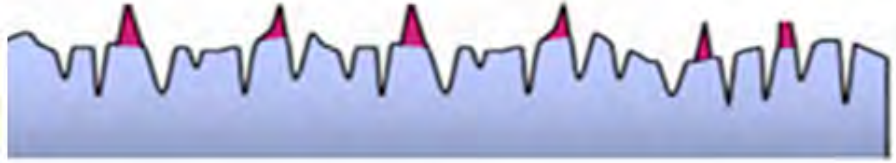
ASTM D2783 (Kgf)	20% Weld Load		10% Weld Load		5% Weld Load	
	HN	AB	HN	AB	HN	AB
NOVITAS 2301S	800+	800+	800	800	400	620
CA1	<400	620	<400	<400	<400	<400
CA2	<400	500	<400	<400	<400	<400
CLP					400 (25%)	620 (50%)

EP-2301S for Forming



EP-2301S for Gear & Severe MWF's





Phosphorus

Sulfurs

Synergy

Oxygenates

Salts

Carboxylates



Total EP Solutions

EP + Antiwear + Lubricity Additives

Total EP Solutions EP + Antiwear + Lubricity Additives

	<u>LCO 802</u>	<u>LCO 20</u>	<u>LCO 30</u>	<u>LCO 40</u>	<u>EP-2301S</u>	<u>C1</u>
Chemistry	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
	S-based	S-based	S-based	S-based	P-based	Sb-DTC
Dosage	5%	5%	5%	5%	5%	5%
S/P content	0.8%	1.0%	1.5%	2.0%	0.4%	
Weld load	315 kgf	315 kgf	500 Kgf	315 Kg	315 Kgf	200 Kgf
2% @D130	1B	1B	3B	4C	1B	1B



Innovative EP Chemistries: AP 6009

- S/P Based, no heavy metals
- Exceptional Load Carry Performance
- Synergistic with AW/CI components

EP-2301S (CLP Replacement)	EP-6009	Antimony DTC Additive	EP-7001 Solid EP
Liquid	Liquid	Liquid	Solid
5% in AN23	10-12% in High viscosity Oil blends	5% in AN23	3% in Base Grease
315Kg weld	800Kg weld	200Kg weld	315Kg weld

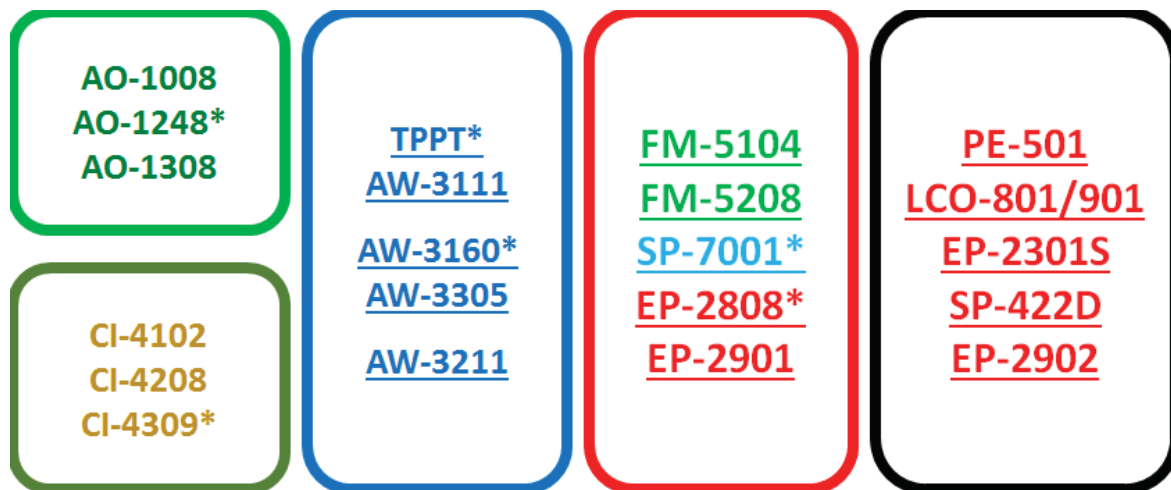
EP Highlights

***Curiosity +
Chemistry +
Creativity =
Innovations***

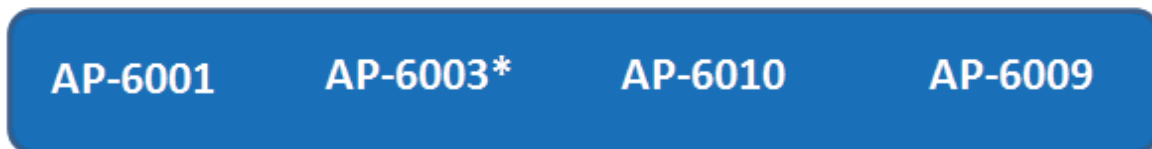
- **LCO-20/30/40**: Sulfurized HC
- **SE-601**: Oil based Polymerized Ester
- **SE-701**: Water based Polymerized Ester
- **LCO-801**: Oil based Low Odor Sulfurs
- **LCO-901**: Water based Low odor Sulfurs
- **EP-2301S**: P-based Chlorine Replacement



Additive Components



Additive Packages





Innovation & Quality
You Can Count On



Novitas would like to thank STLE for the opportunity to present this paper.

And most importantly--We would like to thank you for attending.

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