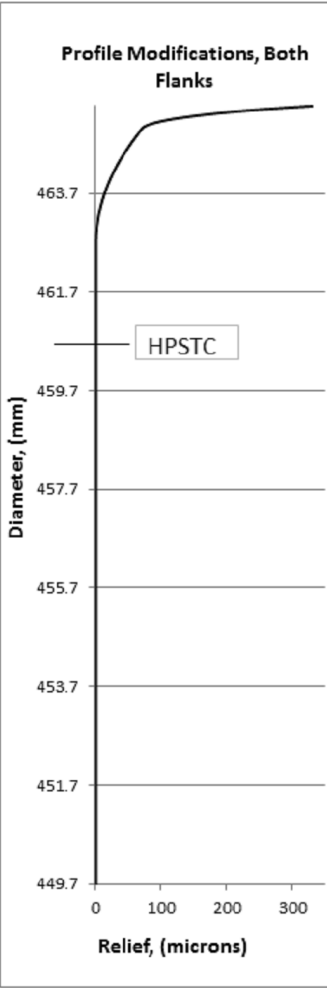
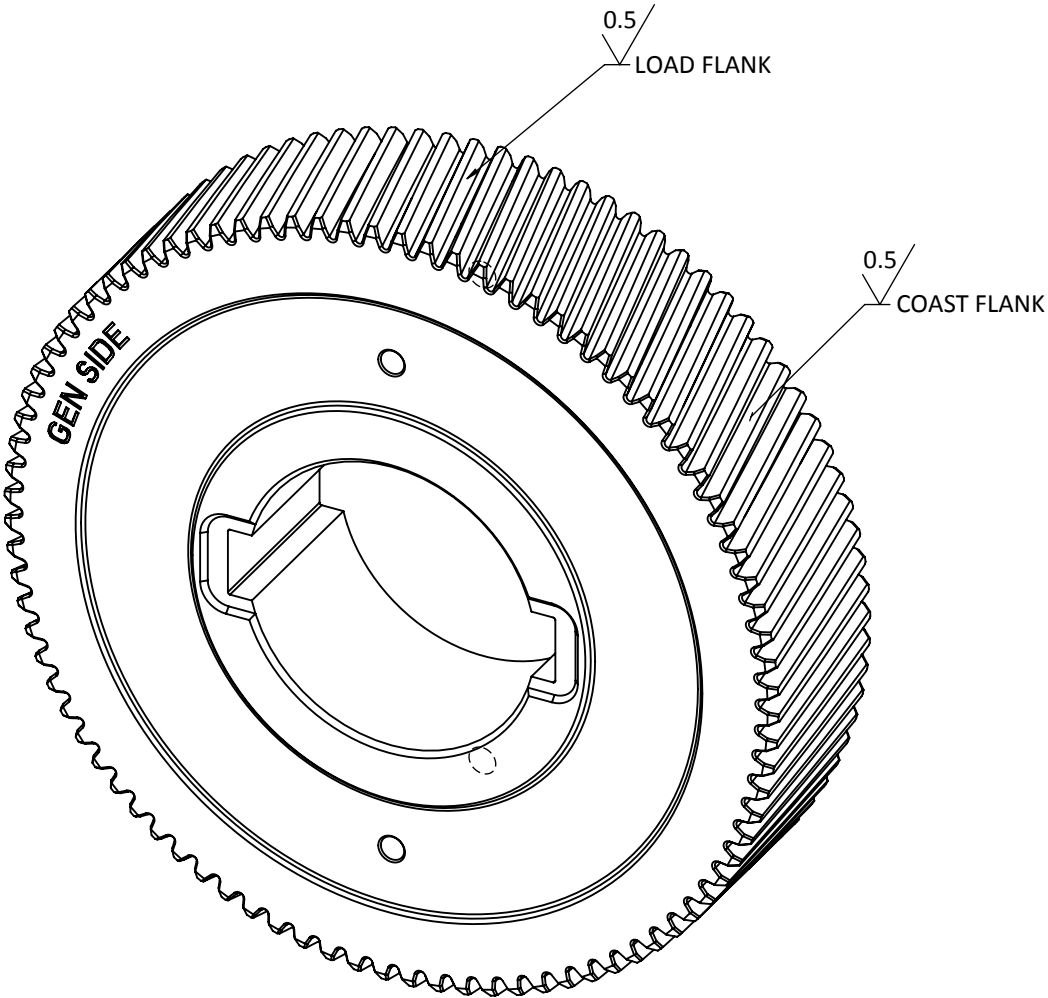


External Involute Helical Gear Data	
Number of Teeth	88
Normal Module (mm)	5.0000
Normal Pressure Angle	20.0000
Whole depth Constant (REF)	2.350
Oper pitch diameter (mm)	456.0000
Gen Pitch diameter (mm)	453.4700
Base diameter (mm)	424.5815
Major Diameter (REF) (mm)	465.463
Form Diameter with Pinion (mm)	447.946
Root Diameter (REF) (mm)	440.59
Min Tool Tip Radius (mm)	2.10
Addendum Modification X2	0.2024
Hand of Helix	Left
Gen Helix Angle	14.0000
Lead (mm)	5713.8308
Number of teeth in Mate	22
Center Distance (mm)	285.000
Normal cir BL w/ Pinion (max/min) (mm)	0.3 / 0.2
Quality per AGMA 2015-1	A 5
Quality Datum Surface	A-B
Trans Cir TT on Gen Dia, (max/min) (mm)	8.354 / 8.299
Size over 9.4 balls (max/min) (mm)	469.17 / 469.035
Span over 12 teeth (max/min) (mm)	176.7 / 176.65



Profile Mods			
Position, LA, (mm)	Degrees of Roll	Diameter , (mm)	Relief, (microns)
71.390	19.268	447.946	0.0
91.976	24.824	462.718	0.0
92.154	24.872	462.860	0.3
92.333	24.920	463.002	1.1
92.511	24.968	463.144	2.5
92.689	25.016	463.286	4.4
92.867	25.064	463.429	6.9
93.045	25.112	463.572	9.9
93.223	25.160	463.715	13.4
93.401	25.208	463.858	17.6
93.579	25.256	464.002	22.2
93.758	25.305	464.146	27.4
93.936	25.353	464.290	33.2
94.114	25.401	464.434	39.5
94.292	25.449	464.579	46.4
94.470	25.497	464.723	53.8
94.648	25.545	464.868	61.8
94.826	25.593	465.014	70.3
94.872	25.605	465.051	73.8
94.918	25.618	465.088	80.1
94.964	25.630	465.126	89.1
95.010	25.642	465.163	100.9
95.056	25.655	465.201	115.7
95.101	25.667	465.238	133.7
95.147	25.680	465.276	155.0
95.193	25.692	465.313	180.0
95.239	25.704	465.351	209.2
95.285	25.717	465.388	243.0
95.331	25.729	465.426	282.3
95.376	25.741	465.463	328.4

NO LEAD MODIFICATIONS



- NOTES:
- MATERIAL: SAE E9310; ALT. E9310H, 4820, 4820H, 18 CRNIMO, 7-6 17 CRNIMO 7 STEEL BAR OR FORGING. MATERIAL SHALL CONFORM TO EN-10084 AND ISO 6336-5 GRADE MQ, OR AGMA 2001-D04-GRADE 2 WITH MATERIAL CLEANLINESS CERTIFIED TO ASTM E45 METHOD 'A' TO MEET

A		B		C		D	
Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy
3	3	2.5	1.5	2.5	1.5	2	1.5

- PROVIDE INSPECTION REPORTS OR PROOF ACCORDING TO THE PROVISIONS EN-10204-3.1.
- 
- ULTRASONIC TESTING: TESTING OF FORGINGS MUST FOLLOW THE PROVISIONS OF EN-10228-3 LEVEL 3 (AGMA A-388- TO AN EQUIVALENT 3 mm FLAT BOTTOMED HOLE IS AN ACCEPTABLE ALTERNATIVE.)
- CRACK TESTING: MAGNETIC PARTICLE TEST GROUND SURFACES TO ISO 6336-5 GRADE MQ (ALT: AGMA 2001-D04-GRADE 2) NO CRACKS ALLOWED.
- HEAT TREAT: CARBURIZE TEETH 1.2/2.2mm EFFECTIVE CASE DEPTH, HARDEN TO 58/61 HRC, CORE HARDNESS 28/40 HRC MIN. @ MID-TOOTH ROOT DIAMETER REMAINDER OF SURFACES OPTIONAL. PROCESS PER AGMA 2001-D04 GRADE 2. CASE DEPTH IS ON FINISHED GEAR TEETH, AFTER GRINDING. KEEP THREADS SOFT

7 IDENTIFY WITH PART NUMBER, REV LEVEL, SUPPLIER INITIALS, JOB NUMBER, SHOP ORDER NUMBER, AND WORDS "GEN SIDE" AS SHOWN FOR PROPER ASSEMBLY TO LOAD FLANK

8 GROUND TOOTH FLANKS AND FULL ROOT FILLET MUST BLEND WITHOUT GRIND NOTCH

9. HELICAL GEAR TEETH MUST MEET GRIND TEMPER REQUIREMENTS OF AGMA 2007 CODE GRADE FB-1

10. RADIAL ALIGNMENT OF GEAR TEETH TO OTHER FEATURES NOT REQUIRED

11. ALL UNSPECIFIED FILLETS-R3, UNSPECIFIED CHAMFERS-1x45

REPORT ERRORS & CHANGES REMOVE ALL BURRS AND SHARP EDGES DIMENSIONS ARE IN MILLIMETERS. UNSPECIFIED TOLERANCES: DECIMALS: FINISH: ANGLES: X. ±1.0 3.2 √μm Ra .X ±0.5 .XX ±0.25 COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY			<b>National Renewable Energy Laboratory</b>		
DRAWN JFC DATE: 8/29/12 CHECKED NJB THIRD ANGLE PRJ			TITLE: <b>GEAR, HIGH SPEED SHAFT</b>		
SIZE <b>B</b>			DWG. NO. <b>254510</b>		REV <b>H</b>
SCALE: 1:4			WEIGHT: 14.65 kgs		SHEET 2 OF 2