Elizabeth

TABLETING TIPSHEET

PROBLEMS

PICKING

Letters and/or numbers on tablet not crisp and clear. Punch face has powder adhering to surface in the same areas as tablet degradation. Compression related issue.

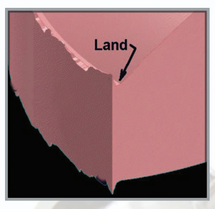
ELIZATIPS

- *Polish the letters and numbers on the punch face.*
- *Explore variety of possible tool coatings.*
- *Press tips: reduce press speed to increase dwell time, reassess precompression and upper punch penetration if possible.*
- *Update tool design based on in-depth examination of tablet and tooling.*

STICKING

Similiar in appearance to picking in regards to powder adhering to the punch face, but generally tied to a reaction between formulation and the punch steel type or degraded punch face condition.

- *Check formulation and steel type for reactive properties.*
- *Check all punch and die surfaces for corrosion or abrasion, may require changing steel type based on findings.*
- *Polish the punch face and closely examine surfaces for abrasion.*
- *If compression requirements rule out a steel change, consider chrome plating or coating the tooling for better wear characteristics.*



FLASHING

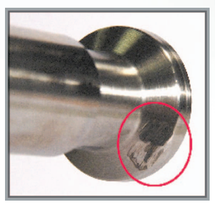
Flashing appears as small peaks around the tablet perimeter, and can be due to excessive punch edge wear, or too large of a clearance between the punch tip and die cavity .

- *Check the fit between the punch and die for excess clearance.*
- *Examine the punches for chiseled edges. A 400-600 grit flat stone can be used to remove the wear and form a new perpendicular and sharp outer punch edge.*
- *Check to be sure pressing is not occurring high in the die taper.*
- *Formulation may have excessive fines.*

TWINNING

Occurs when two cup or tablet perimeter surfaces stick together during the tablet coating process.

- *Radius the cup design of the punch.*
- *Radius the sides of the capsule .004 - .010.*
- *Contact Elizabeth engineering for design recommendations.*



PUNCH INNER ANGLE WEAR

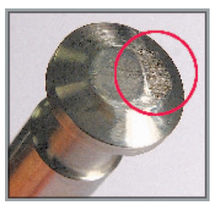
Shaped tools normally show as two opposing wear locations. Round tools show radial wear.

- *Primary cause is tightness or binding between the punch and die so check clearances on both.*
- *Check concentricity of both the punches and the dies.*
- *Check for powder adhering to either the upper or lower tip perimeter and die cavity.*
- *Check the lower punch barrel lubrication.*
- *Clean the cams of any metal deposits before resuming production.*

SYMMETRIC PUNCH TIP WEAR

Upper punch tip perimeter wear marks perpendicluar to the punch edge and located at opposing corners on a shape punch tip.

- *An alignment problem - check set up - turn the upper punch or alignment gauge in the same direction as the press rotation.*
- *Check to be sure the die is not rotating in the die socket.*
- *Check the punch tip, barrel and die cavity concentricity for a clearance problem between the punch tip and die cavity.*
- *Use special EEE alignment punch and Elizabeth tooling to maintain uniform clearance. Triple-E tooling - "Easy, Efficient, Economical"*



SPAULDING ON PUNCH HEAD

Metal fatigue on the punch head from high pressure or tonnage during tablet pressing.

- *Reduce the pressure or tonnage.*
- *Slow down the press to increase the dwell time.*
- *Increase the flat area on the punch head.*
- *Dome the punch head to change the pressure wheel & punch head contact point.*

TABLET HARDNESS CONVERSION CHART

Kilo pond (Kp)	Kilogram Force (kgf)	Newtons (N)	Pound Force (lbf)	Strong Cobb (SC)
1.00	1.00	9.81	2.20	1.40
5.00	5.00	49.03	11.02	7.00
10.00	10.00	98.07	22.05	14.00
15.00	15.00	147.10	33.07	21.00
20.00	20.00	196.13	44.09	28.00
25.00	25.00	245.17	55.12	35.00
30.00	30.00	294.20	66.14	42.00
35.00	35.00	343.23	77.16	49.00
40.00	40.00	392.27	88.19	56.00
45.00	45.00	441.30	99.21	63.00
50.00	50.00	490.33	110.23	70.00

DIE LOCK SCREW PRESSURES

PUNCH BARREL SIZE	DIE LOCK SCREW SIZE	PRESSURE in foot pounds
3/4 INCH	5/16 HEX	15
1 INCH	5/16 HEX	20
1 ¼ INCH	5/16 – 3/8 HEX	25
1 ½ INCH	3/8 HEX	30

A Torque wrench is recommended in order to assure the proper pressure is applied.

PRESSURES SHOWN ARE RECOMMENDED FOR ROUND CAVITY DIES. FOR CAPSULES, OVALS, AND OTHER SHAPES AND CARBIDE LINED DIES THE PRESSURES SHOULD BE REDUCED BY 10%

CHEMICAL COMPOSITION OF TOOL STEELS Percentage of Chemical Elements

CHEMICAL ELEMENT	408	S1	S5	S7	A2	D2	D3	440C	01
CARBON	.50	.40-.55	.50-.65	.45-.55	.95-1.05	1.40-1.60	2.00-2.35	.95-1.20	.90
MANGANESE	.50	.10-.40	.60-1.00	.20-.80	.00-1.00	.00-.60	.00-.60	.00-1.00	1.20
SILICON	.25	.15-1.20	1.75-2.25	.20-1.00	.00-.50	.00-.60	.00-.60	.00-1.00	.40
CHROMIUM	.75	1.00-1.80	.00-.35	3.00-3.50	4.75-5.50	11.0-13.0	11.0-13.5	16.0-18.0	.50
VANADIUM		.15-30	.00-.35	.00-.35	.15-.50	.00-1.10	.00-1.00		.20
TUNGSTEN		1.50-3.0					.00-1.00		.20
MOLYBDENUM		.00-.50	.20-1.35	1.30-1.80	.90-1.40	.70-1.20		.00-.75	
NICKEL	3.0							.00-.50	
COBALT						.00-1.00			

NEED MORE HELP? For further information contact your local Elizabeth Companies representative or visit www.Eliz.com

Elizabeth

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