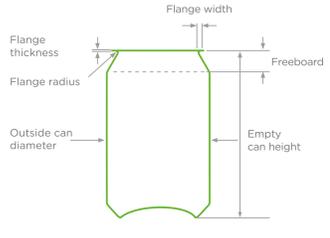
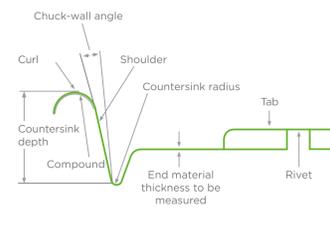
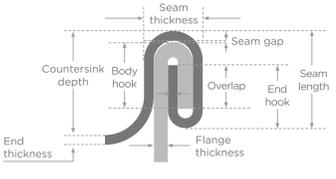
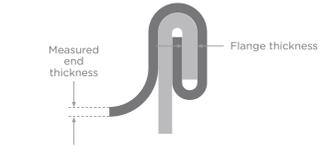
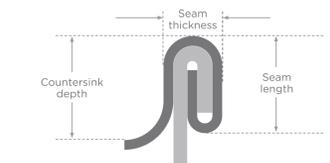
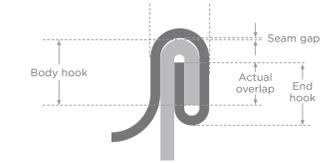
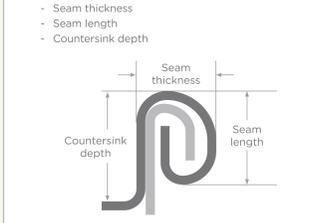
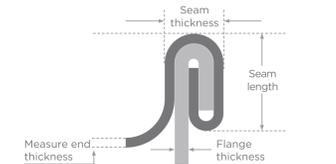
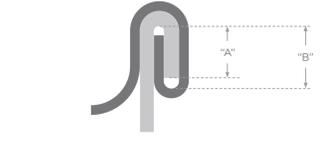
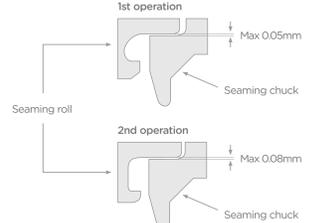
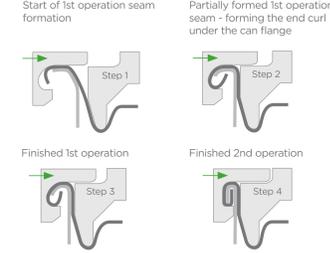
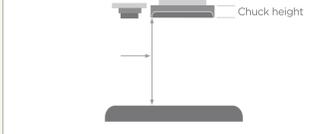
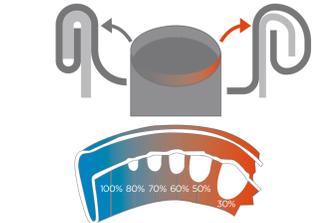
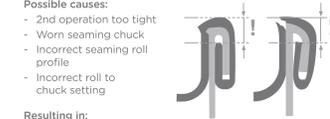
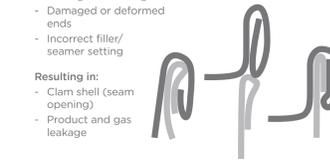
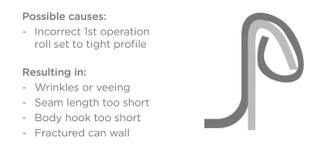
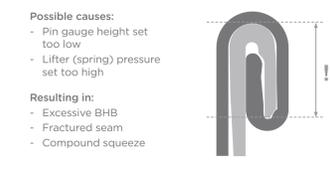
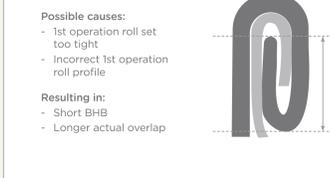
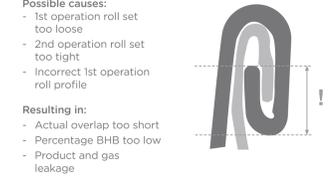
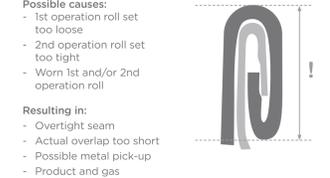
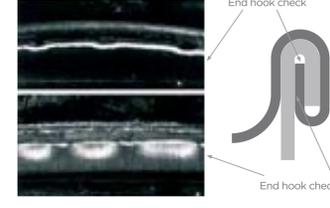


<h3>Introduction</h3> <p>This double seam reference chart is intended for use by personnel responsible for setting and checking double seams. In addition, the chart will provide a useful guide to good double seaming practice, for engineers, production operators and quality assurance personnel.</p> <p>Its prime objective is to assist personnel whose decisions determine the quality of double seams.</p>	<h3>Can Terminology</h3> 	<h3>End Terminology</h3> 	<h3>Double Seam Evaluation</h3> <ul style="list-style-type: none"> - Visual external examination - External measurements - Seam sections - Teardown examination 	<h3>Evaluation Frequency</h3> <ul style="list-style-type: none"> - A visual check should be carried out every hour - A full 1st operation seam evaluation should be carried out once a week - A full 2nd operation seam evaluation should be carried out during every shift
<h3>Seam Evaluation</h3> <p>Critical Parameters:</p> <ul style="list-style-type: none"> - Tightness rating - Actual overlap - Body hook butting - Seam gap - Seam thickness <p>Other Parameters:</p> <ul style="list-style-type: none"> - Seam length - Countersink depth - Body hook - End hook 	<h3>Typical Double Seam</h3>  <p>Nominal seam thickness = 3 x measured end thickness + 2 x can flange thickness + stealing compound</p>	<h3>External Seam Components</h3> 	<h3>Internal Seam Components</h3> 	<h3>1st Operation Seam Evaluation</h3> <ul style="list-style-type: none"> - Seam thickness - Seam length - Countersink depth 
<h3>2nd Operation Seam Evaluation</h3> <ul style="list-style-type: none"> - No sharpness in upper portion of countersink - External dimensions within double seam specifications 	<h3>Body Hook Butting (BHB)</h3> <ul style="list-style-type: none"> - Calculated A/B x 100 = percentage 	<h3>Seaming Process</h3> <ul style="list-style-type: none"> - Height adjustment - seaming chuck to roll clearance 	<h3>Seam Formation</h3> <p>Start of 1st operation seam formation</p> <p>Partially formed 1st operation seam - forming the end curl under the can flange</p>  <p>Finished 1st operation</p> <p>Finished 2nd operation</p>	<h3>Seaming Process</h3> <ul style="list-style-type: none"> - Pin gauge height - Distance between base-plate and chuck lip at the peak of 1st operation cam - Needs to be adjusted after can height change  <p>Calculation: Finished can height - (chuck lip height + lifter deflection)</p>
<h3>Double Seam Faults Analysis</h3> 	<h3>Sharp Seam/ Fractured Seam</h3> <p>This condition is identified where the seam has a sharp edge on the inner seam radius.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> - 2nd operation too tight - Loose 2nd operation roll - Incorrect seaming chuck - Worn seaming chuck - Incorrect pin gauge height setting - Worn seamer tooling and equipment - Incorrect roll to chuck setting <p>Resulting in:</p> <ul style="list-style-type: none"> - In extreme cases this may cause the seams to split or slivers to occur 	<h3>Skidder</h3> <p>An incomplete 2nd operation seam occurs when the can ceases to rotate during the seaming process.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> - Incorrect seaming chuck - Lifter (spring) pressure set too low - Incorrect pin gauge height setting - Worn seamer tooling and equipment - Incorrect chuck surface finish <p>Resulting in:</p> <ul style="list-style-type: none"> - Product and gas leakage 	<h3>False Seam</h3> <p>Defect where a portion of the end and body hook are not interlocked</p> <p>Possible causes:</p> <ul style="list-style-type: none"> - Damaged can flange - Damaged or deformed ends - Incorrect filler/seamer setting <p>Resulting in:</p> <ul style="list-style-type: none"> - Clam shell (seam opening) - Product and gas leakage 	<h3>1st Operation too Loose</h3> <p>Possible causes:</p> <ul style="list-style-type: none"> - 1st operation roll set too loose - Worn 1st operation roll - Incorrect 1st operation roll profile <p>Resulting in:</p> <ul style="list-style-type: none"> - End hook too short - Large "finished" seam gap - Reduced actual overlap 
<h3>1st Operation too Tight</h3> <p>Possible causes:</p> <ul style="list-style-type: none"> - Incorrect 1st operation roll set to tight profile <p>Resulting in:</p> <ul style="list-style-type: none"> - Wrinkles or veeing - Seam length too short - Body hook too short - Fractured can wall 	<h3>Excessive Seam Gap</h3> <p>Possible causes:</p> <ul style="list-style-type: none"> - Loose 2nd operation roll - Incorrect seaming chuck to roll clearance - Incorrect seaming chuck - Incorrect pin gauge height - Lifter (spring) pressures set too low <p>Resulting in:</p> <ul style="list-style-type: none"> - Possible metal pick-up - Product and gas leakage 	<h3>Body Hook too Long</h3> <p>Possible causes:</p> <ul style="list-style-type: none"> - Pin gauge height set too low - Lifter (spring) pressure set too high <p>Resulting in:</p> <ul style="list-style-type: none"> - Excessive BHB - Fractured seam - Compound squeeze 	<h3>Body Hook too Short</h3> <p>Possible causes:</p> <ul style="list-style-type: none"> - Pin gauge height set too high - Lifter (spring) pressure set too low - 1st operation roll set too tight <p>Resulting in:</p> <ul style="list-style-type: none"> - Actual overlap too short - Low BHB - Increased seam gap - Product and gas leakage 	<h3>End Hook too Long</h3> <p>Possible causes:</p> <ul style="list-style-type: none"> - 1st operation roll set too tight - Incorrect 1st operation roll profile <p>Resulting in:</p> <ul style="list-style-type: none"> - Short BHB - Longer actual overlap 
<h3>End Hook too Short</h3> <p>Possible causes:</p> <ul style="list-style-type: none"> - 1st operation roll set too loose - 2nd operation roll set too tight - Incorrect 1st operation roll profile <p>Resulting in:</p> <ul style="list-style-type: none"> - Actual overlap too short - Percentage BHB too low - Product and gas leakage 	<h3>Excessive Seam Length</h3> <p>Possible causes:</p> <ul style="list-style-type: none"> - 1st operation roll set too loose - 2nd operation roll set too tight - Worn 1st and/or 2nd operation roll <p>Resulting in:</p> <ul style="list-style-type: none"> - Overtight seam - Actual overlap too short - Possible metal pick-up - Product and gas leakage 	<h3>Tightness Rating (Wrinkle Assessment)</h3> 	<h3>Wrinkles on the inside Face of the End Hook</h3> <p>Possible causes:</p> <ul style="list-style-type: none"> - Incorrect (loose) 2nd operation roll setting - Worn or damaged tooling <p>Resulting in:</p> <ul style="list-style-type: none"> - Product and gas leakage 	<h3>Body Wall Fracture</h3> <p>Possible causes:</p> <ul style="list-style-type: none"> - Incorrect 1st operation roll setting - Worn 1st operation roll profile <p>Resulting in:</p> <ul style="list-style-type: none"> - Product and gas leakage 