Capping Kept Simple

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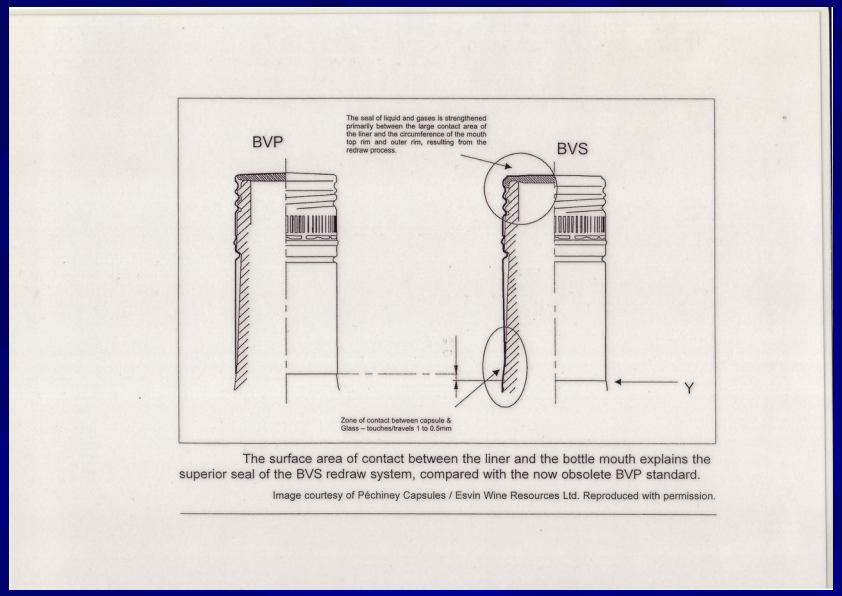
Growth in ROPP Capping

- The resurgence of ROPP capping in Australia occurred during the late 1990s.
- Winemakers tasted some old screw capped Rieslings from a demolished shed at Clare in the mid – late 1990s. The wine was found to be fresh.
- Vintages ranged from 1978-1985.
- These Rieslings had 1.6g/l CO_2.
- The bottles were capped to what is now called BVP specification.

BVS Compared to BVP



The surface area of contact between the liner and the bottle mouth explains the superior seal of the BVS redraw system, compared with the now obsolete BVP standard.

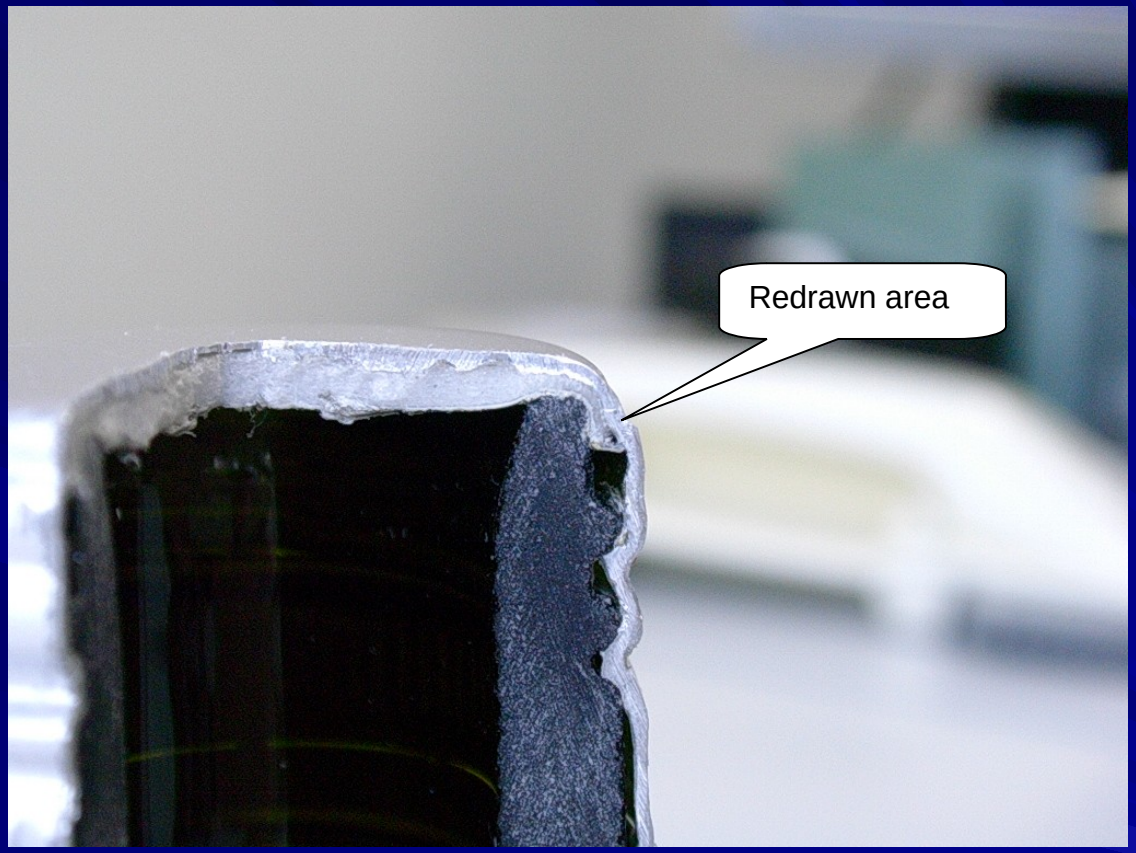
Image courtesy of Péchiney Capsules / Esvin Wine Resources Ltd. Reproduced with permission.

- BVP typically had a 6° bevel around the edge of the cap.
- BVS can be identified by the cap redrawn to enable the wad (or gasket) to be pinched between the cap and bottle proving extra sealing strength.
- A similar technique was used on soft drink bottles to hold increased pressure.

An image of a cut away bottle top, capped to BVP specification.

Thank you to O-I Australia for cutting bottles for us.
It is difficult to see the 6° bevel around the edge of the cap.
This capping method was good enough to seal 1978 Riesling for 20 years.

An image of a cut away bottle top capped to BVS specification.



The image clearly shows the redrawn area which pinches the wad.
If the capping machine was not set properly the redraw would not be evident.

Turning Away From Tradition

- A traditional method to sign off on quality checks in the bottling environment is to measure the force required to remove the cap.
- This is called torque and is typically measured in either inch/pounds or kg/cm.
- This only tells you the effort required to remove the cap.
- This measure alone is irrelevant to machine setup or process quality control.
- If the bottles are slightly rough, or out of round, the torque will increase dramatically.
- When torques are either high or low, attention has traditionally been focussed on spinning heads and side roller tension.
- This often results in many hours of lost production time.
- Backing off the roller tensions may “correct” the torque, but will promote thread stripping and skirt slipping.
- Thread stripping is detrimental to keeping the wine in the bottle, and oxygen away from the wine.

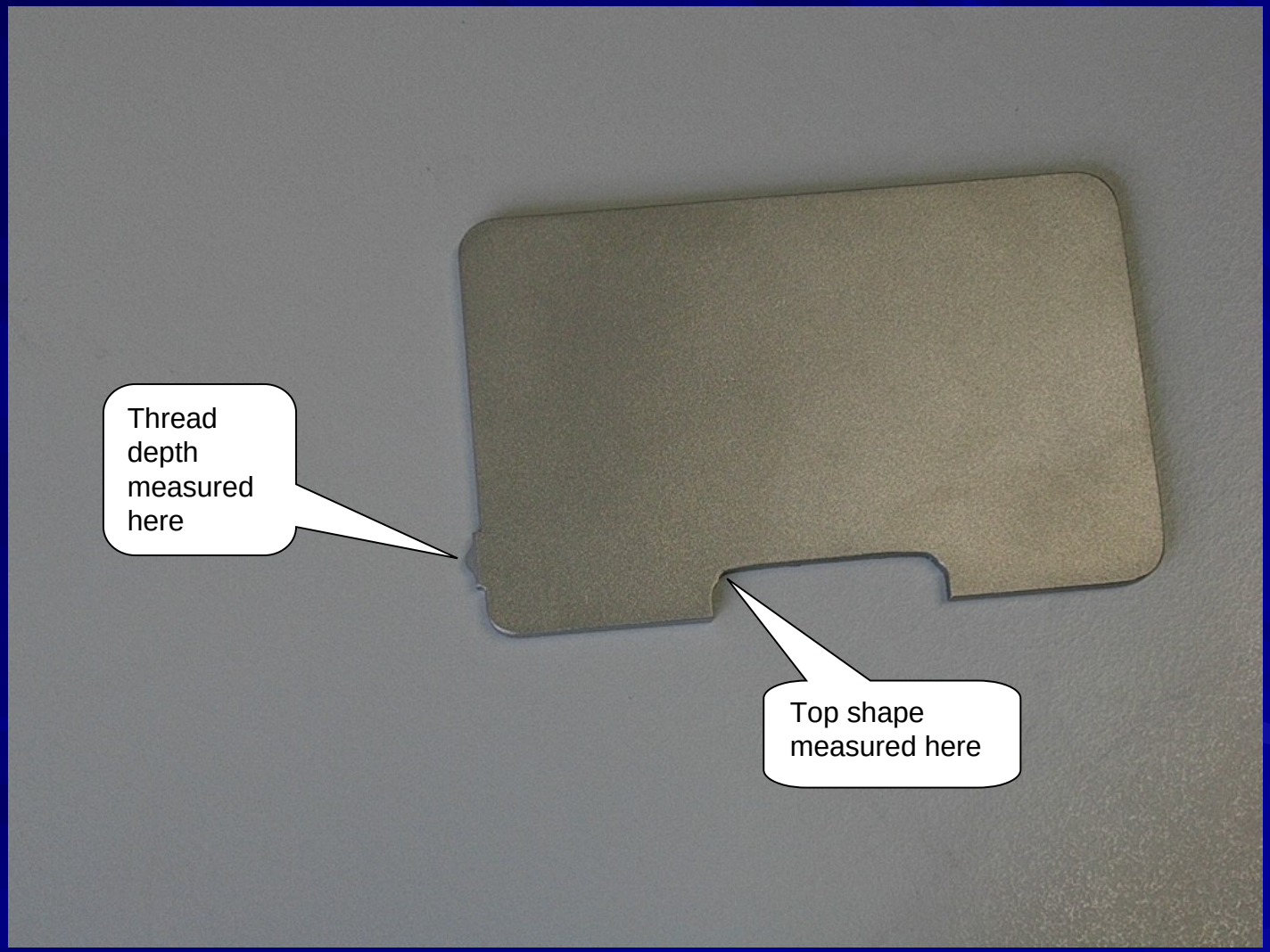
A Better Way

- Measure things that matter most.
- Mark the machine height settings on an indicator such as a ruler, for each bottle to be run, so operating personnel can reference it. Maintain the height gauge.
- BVS capping technique has a readily visible top shape.
- Measure the top shape depth (redraw depth). This will ensure the head is shut properly and the wad is compressed properly.
- Measure the thread depth. If the thread is not deep enough, the thread will strip and cap will come off. If the machine height is wrong, the rollers do not operate at the correct depth.
- Visual inspection system manufacturers are now working on these items.
- Clean the spinning heads weekly in warm water and lubricate them as recommended by the manufacturer. Cleanliness is godliness to a capping head.
- Have the spinning heads serviced by a competent technician at least once per year.

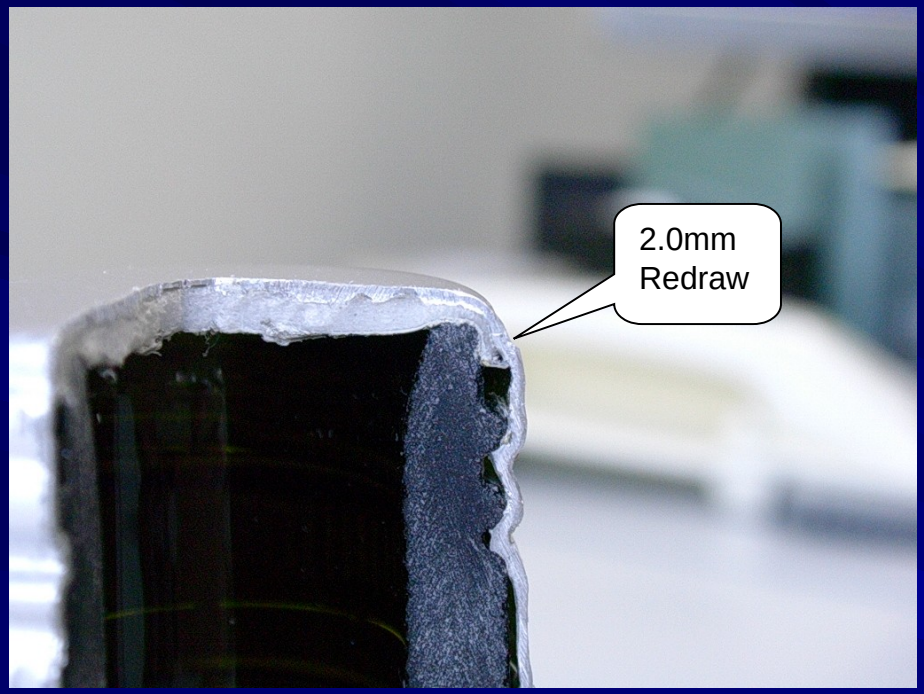
Tools to Measure

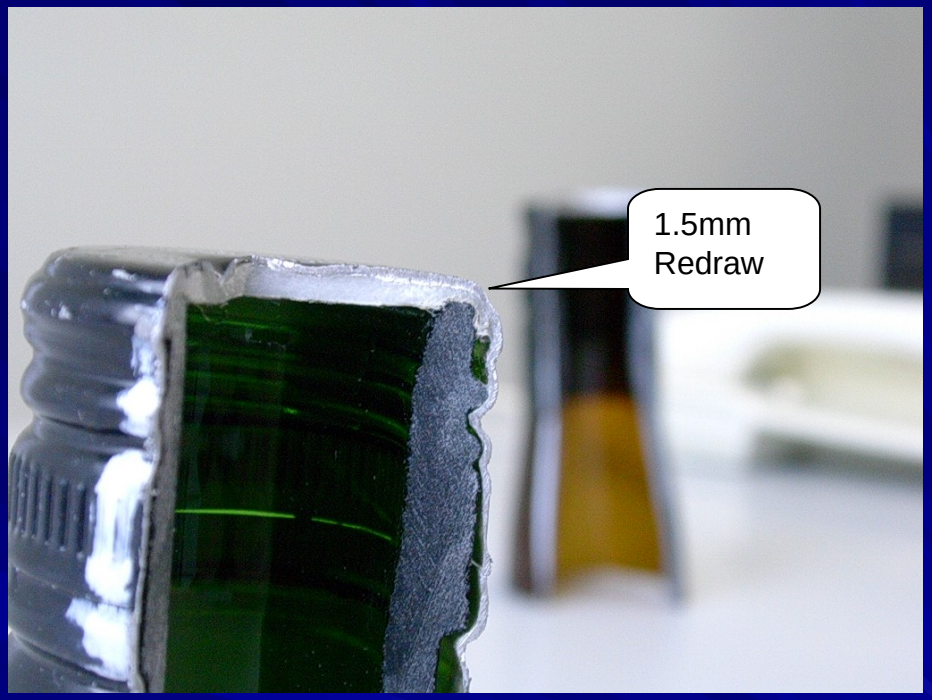
- There are top shape gauges with dial indicators available.
- There are thread gauges with dial indicators available.
- These tools are usually too delicate for a production environment and will lose their value if you bounce them on the floor.
- You can keep it simple.

Here is a simple top shape gauge with a pip to ensure your thread depth is OK. This can be used by anyone and is simple.



To use a gauge such as shown here, care needs to be taken to introduce redraw depths that can be easily seen.

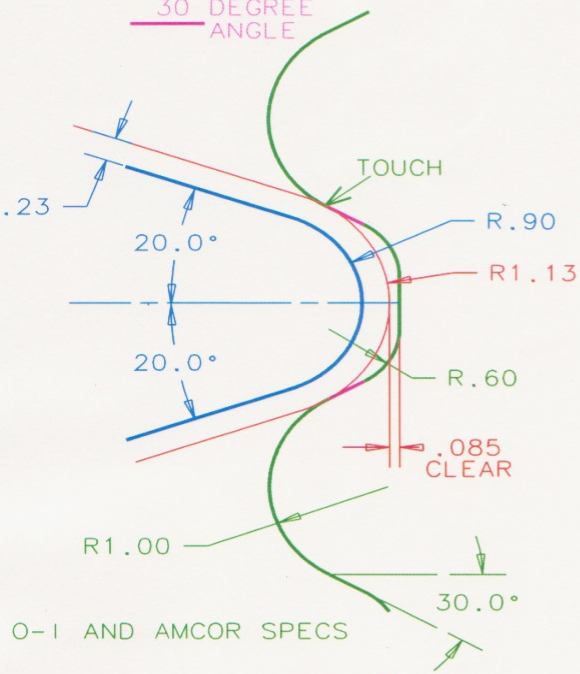




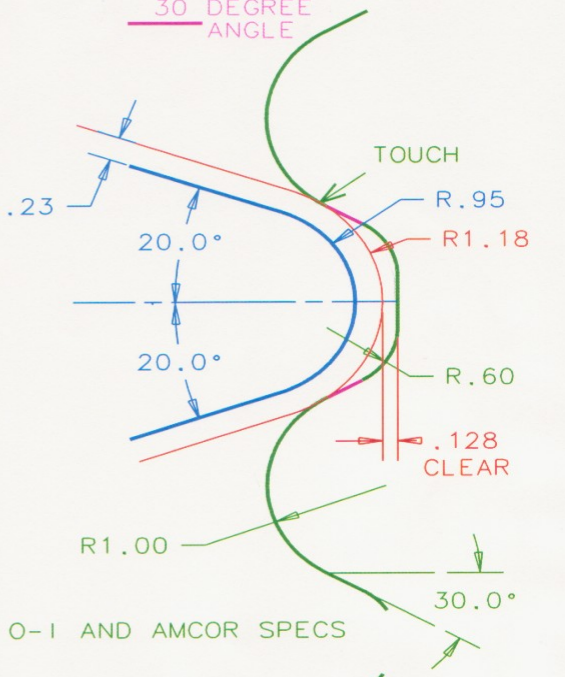
- Redraw depth of 2.0mm is easily visible, but has a tendency to occasionally leave the wad on the bottle when the cap is removed.
- The 2.0mm redraw clearly pinches the wad between bottle and cap.
- The 2.0mm redraw will have a higher removal torque which may upset some people.
- Redraw depth of 1.5mm barely pinches the wad between the bottle and cap, but is still reasonably visible.
- The wad will remain in the cap when removed, with a redraw of 1.5mm.
- A packaging facility should determine their setting for themselves to adequately protect their product and still keep their quality checks simple.
- Most cap suppliers are helpful, but differences will be found in their recommendations.

Spinning Head Settings Shared

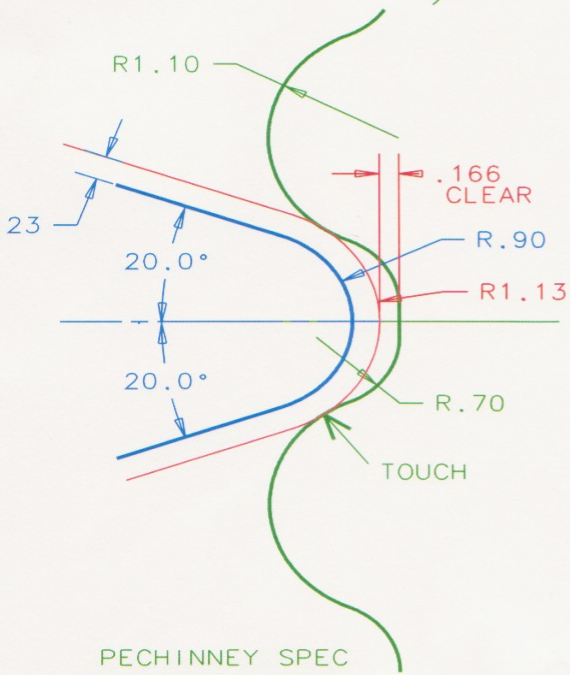
The following page shows theoretical thread roller radii on Australian bottles.



O-I AND AMCOR SPECS

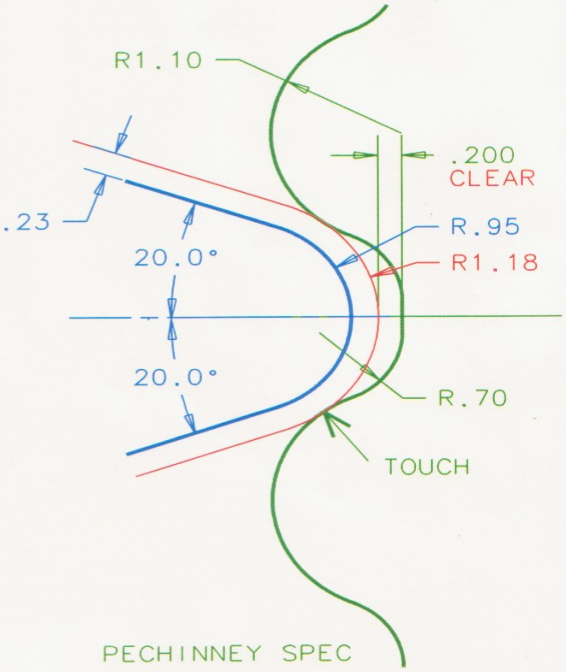


O-I AND AMCOR SPECS



PECHINNEY SPEC

SCALE 20:1



PECHINNEY SPEC

SCALE 20:1

Roller Radii

- A thread roller radius of 0.9mm will work some cap material into the thread making a very strong thread.
- Some cap manufacturers recommend a smaller radius for the thread roller. This will give lower removal torques. Experiment yourself on thread strength, by testing for strength required to strip the thread.

The following sheet shows a spec sheet to ensure consistency when resetting capping heads.

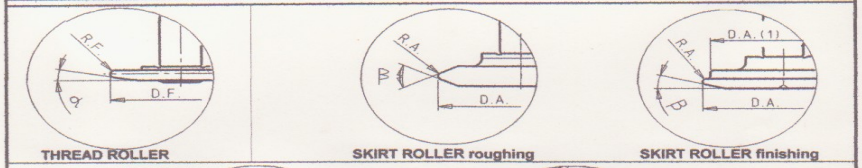
AROL closure systems

SCREW CAP TECHNICAL SPECIFICATION

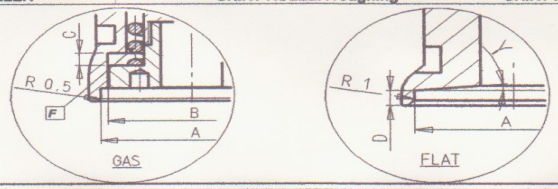
Costa ENTERPRISES

Date:		**Screw Cap Size:**	**30 x 60**
SCREW CAP MANUFACTURER: Auscap			**Bottle:Glass**
REF.:		**HEADS N.:**	**Product: Gas ☐ Flat ☐**
S/N.:	**O.A.:**	**PITCH DIA.:**	**Filled product: Still Wine**

Characteristic		Specification	
Top load		150-180	[kg]
Number of thread rollers		2	
Thread roller diameter *[D.F.]*		30	[mm]
Thread roller radius *[R.F.]*		0.9	[mm]
Thread roller angle *[α]*		20	[°]
Thread rollers side pressure		10	[kg]
Skirt rollers number	[rough./ finish.]	finish 2 piece	
Skirt roller diameter *[D.A.]*	[rough./ finish.]	31	[mm]
Skirt roller upper diameter *[D.A.(1)]*	[finish.]	28	[mm]
Skirt roller radius *[R.A.]*	[rough./ finish.]	0.6	[mm]
Skirt roller angle *[β]*	[rough./ finish.]	20	[°]
Skirt roller side pressure	[rough./ finish.]	9	[kg]
Cap centering diameter *[A]*		30	[mm]
Pressure block diameter *[B]*	*[gas]*	27.5	[mm]
Pressure block depth *[C]*	*[gas]*	1.5	[mm]
Pressure block inner spring load *[F]*	*[gas]*	15	[kg]
Pressure block depth *[D]*	[flat]	2.0	[mm]
Pressure block angle *[γ]*	[flat]	0	[°]
Removal Slip torque			[lbs x inch]
Removal Bridge torque			[lbs x inch]
Removal torque after 24 h			[lbs x inch]



THREAD ROLLER | SKIRT ROLLER roughing | SKIRT ROLLER finishing



NOTE:

If the pressure block or thread/skirt roller profile are special, drawings are required.

NB. If Arol won't receive the a.m. specification will procede using internal specification. In case of additional intervention necessary after the machine/capper delivery caused by the a.m. specification missing for your choosen caps, these won't be considered as warranty intervention.

AROL spec sheet from Costa Enterprises.