



# CAVELLI LINEN LAUNDRY GUIDE



# **I N T R O D U C T I O N**

**This document is meant to be a general guideline. Different laundries have different equipment, processes, and chemical systems. On-premises laundries often use residential type equipment or heavy-duty industrial versions of residential equipment, such as front-loading washing machines and tumble dryers. The heavy-duty equipment generally uses higher temperatures and process larger volumes than residential laundry equipment. Commercial washers can process 12-80 kg of linens and washing temperatures can be between 70-80C for disinfection/sanitation. Commercial tumble dryers operate between 25-80C. Some on-premises laundries do not iron and some use heated roll ironers or compact versions which can operate at ironer surface temperatures up to 200C. Commercial laundries often use high volume equipment such as heated roll ironers with one, two, or even three roll ironers which can operate up to 200C ironer surface temperatures per ironer. Therefore, individual laundries must determine the best practices for their own facility. When considering best practices for laundering 100% cotton and cotton/polyester blend bedding products, they must consider that bedding products must be laundered with care. The purpose of this document is help laundries and hospitality property operators understand the critical care issues to achieve maximum performance and durability of bedding products.**

## **D E T E R G E N T   S O L U T I O N**

**A non-ionic surfactant with good emulsifying properties should be a part of the detergent system. Non-ionic surfactants wet and clean fibres more readily than other classes of surfactants and are compatible with other products in the wash bath. They remove and suspend soil and also have some anti-microbial properties. The use of sufficient detergent for the removal of soils, especially oils and fats, is essential to prevent re-depositing of soil and irreversible greying or dulling of the sheets. Many commercial laundries use what's called a "built" detergent which means they contain additives such as alkali to adjust pH to 8-9 for maximum cleaning**



# W A S H I N G

**New bedding products must be washed before use and separate from other bedding to ensure that any fugitive dyes and chemicals from manufacturing are removed. On-premises and other smaller laundries sometimes sort and separate heavily soiled items so those items will receive stringent soil removal process prior to the normal washing process. Large commercial laundries generally do not sort prior to washing and tend to set up a harsher washing process to handle the bulk of conditions. During folding and inspection soiled or stained items will be sorted for reprocessing. Oils and fats are common soils which are difficult to remove in laundering. They are most readily emulsified and dispersed with detergent. Other difficult to remove stains include make-up, coffee, wine and blood. These stains may require chlorine or non-chlorine bleach in addition to detergent for stain removal.**

**Modern detergents are effective in a range of temperatures from 30C to 70C.**

**Most large-scale laundries prefer to use higher temperature systems in the 60C – 70C range. Higher temperature systems aid in softening oils and fats for removal and assists in thermal disinfection/sanitation.**

# B L E A C H

**Chlorine bleach is routinely used in commercial laundries in a range of 50-150 PPM to both sanitize the fabric and decolorize stains. Chlorine bleach has several disadvantages if not used correctly. It can have adverse effects on dyed or printed colours which appear as simple stains to the bleach. Chlorine can also be retained in fabric, and retained chlorine can damage and yellow fabric during drying, ironing, and storage. Chlorine is also corrosive and toxic if not handled properly. Modern systems are available which use both reduced chlorine and non-chlorine bleach for promoting whiteness and disinfection sanitation. There are also some enzyme type products available to aid in sanitation.**

# RINSING

Three rinses are recommended for effective soil removal and reducing pH. It has been proven that repetitive rinsing is more effective than single rinsing.

Softeners are generally added during the rinse cycles. To avoid thermally induced wrinkling and creasing, reduced water temperatures are used in each cycle. Reducing rinse temperatures from 60C to 40C to 35C will cool the wash load and accomplish the required results.

# SOFTENERS

Softeners provide for a smooth and supple fabric and a fresh sent. A softener should be chosen that is readily removed in subsequent laundering to avoid build-up and consequent soiling, water repellence or greasiness.

# DRYING

As a general rule of thumb when drying cotton or polyester blend sheeting, approximately 15 litres of water is removed per 50kg of fabric, and in 100% cotton sheets approximately 30 litres of water is removed per 50kg of fabric. Obviously, blend sheets will dry faster than all cotton sheets. Unfortunately, the rapid drying of blend sheets can also lead to overheating and damage to the sheets in some cases. Many commercial laundries use tumble dryers to partially dry the sheets to reduce the load on roller ironing which operates up to 200C surface temperatures. Moisture levels in the 15-35% range are common coming out of drying going to ironing to improve wrinkle and crease removal. The ironing both presses the linens and completes the drying, and with high temperature roller drying it is critical not to over-heat the linens. Many on-premises and smaller laundries use tumble dryers with no ironing.

Caution should be exercised in all drying process. Over drying and overheating fabrics is a critical factor in bed linen durability. Commercial tumble dryers can be purchased to process 10 to 70 pounds of linens and operate at 25-80C. Scorching and yellowing may occur if the sheets are over dried at the higher end of the temperature range. Repeated over-drying will also damage the cotton fibres; fade colours, and increase shrinkage and wrinkles. In extreme cases, polyester fibres can begin to contract and even "melt and fuse" which creates harsh or brittle areas within the fabric. Fitted sheet elastic may lose elasticity and with the resulting shrinkage, the fitted sheets may become unusable. Recommend drying temperature of 60-70C. Product should be removed at 10% moisture level for best results. Overfilling tumble dryers can cause excessive abrasion and wear and most important the bedding products will not tumble and dry evenly causing uneven drying and over-drying and resulting in damaged product. Many other problems can occur in drying that can cause over-drying such as mechanical failure of thermostats.



# IRONING

The principal damage to sheets is overheating which primarily occurs during drying and with some heated roller ironing. If polycotton blend sheets are overheated, thermal contraction and shrinkage and even fusion of polyester fibres occurs. Polyester fibres begin to contract significantly when heated above 180C in a relaxed state. Contraction increases rapidly as fibre temperature increase beyond the 150C threshold. Progressive contraction will occur with repetitive excessive heating. Overheating cotton sheets weakens the fibre and causes it to become brittle. Ironer temperatures are discussed in more detail later, but it is recommended that fabric temperature should not exceed 150C. Important commercial laundry operators understand that fabric temperature is the most important aspect when processing sheets. Heated mangle or roller press type ironers are most common in commercial laundries. Hot oil or thermal ironers are sometimes operated at temperatures in excess of 215C. Electric ironers can reach similar temperatures. Steam heated ironers general operate in the range of 160-180C. A rationale for the use of such high ironing temperatures is to provide a large temperature differential above the boiling point of water, 100C, and thereby increase the rate of drying and ironer production. The danger is that the temperature of the bedding fabric rises rapidly once completely dried. The specific heat or energy required for heating of polyester fibre is very low. Therefore, the temperature of the polyester in a blend sheet virtually jumps to the temperature of the ironer surface when the fabric is dried. Excessive ironer temperatures can lead to excessive fabric temperatures and permanently damage products. The solution to thermal shrinkage and fibre fusion in blend sheets using heated mangle/roller ironers is apparent - don't over-heat sheets - and do not allow fabric temperatures to exceed 150C at any time. Controlled ironing temperature and conditions will also provide such ancillary benefits as reduced energy cost, reduced static generation, improved ambient working temperature, in addition to increased life of sheets.