Product Specification Sheet – T90 Hop Pellets

Product Name: Type 90 Hop Pellets

Product Input: 100% by weight dried, compressed hop cones of the cultivated hop plant Humulus lupulus.

Product Ingredients: 100% by weight pelleted hop cones of the cultivated hop plant Humulus lupulus.

Processing Aid: Food-grade nitrogen. We use food-grade liquid nitrogen for cooling during our milling process to maintain desired temperature and optimize quality of the hops, and food-grade nitrogen gas when packaging hops to increase shelf life and preserve quality by reducing oxygen level to <2.5%.

Manufacturer: Crosby Hops™

8648 Crosby Road NE

Woodburn, OR 97071

Tel.: (503) 982-5166

Description

T-90 hop pellets are the final product of whole leaf hops that have been processed through a series of size reduction and densification steps. First, the whole bale is carefully decompressed using a bale-breaker. The loose-leaf hops are then sent to a hammer mill, which grinds the whole leaf hops into a powder that retains all the natural vegetative and lupulin ingredients. The powder is homogenized in a large mixer and pressed through a pellet die (6mm diameter). The resulting pellets pass through a pellet shaker, which separates the usable pellets from hop dust and broken pellets, which are recycled in the system. Throughout this process, by way of our unique cooling and oxygen limiting steps, we progressively chill our hops as required during the most critical steps of the pelleting process – our methods vary considerably from traditional liquid nitrogen pellet die application methods.

Pellets have three distinct advantages over whole leaf hops: the compact storage size, a significantly increased shelf life due to nitrogen-flushed packaging, and a smaller surface area, which reduces oxidation. More importantly, there is an average 15 percent increase in alpha acid utilization compared to whole leaf in the boil. For these reasons, T-90 hop pellets are increasingly popular within the craft brewing industry. Our extremely low operating temperatures and processing methods create the highest quality hop pellets that retain their whole hop complexity, boldness and character. Crosby T90 hop pellets can be made from any hop variety. Detailed technical data sheets for these hop varieties are available upon request.

CROSBY HOPS™

Quality Statement

Crosby Hops™ produces Type 90 pellets that offer exceptional utilization and dry hopping capabilities. We thoughtfully shepherd our dry hop-friendly Type 90 pellets through our process under the strictest process controls to preserve the robust flavor and aroma compounds often lost during traditional pelleting.

Throughout our operations we maintain world class quality via continuous, in-process monitoring using a zero-chemical NIR spectrometer and a series of gating quality control points.
All hop pellets are processed and delivered as single variety pellets. The mixing of varieties is not allowed except for in the special case of Crosby Hops™ specialty blends which are prepared, advertised, and sold as varietal blends. The mixing of conventional and organic varieties is strictly prohibited.

Packaging

Packaged in one of the highest food-grade bag-sealing solutions on the market, Crosby hops are safely parceled in heavy-duty foil barrier bags utilizing a fully automated WeighPack™ vertical fill form and seal bagger. The packs are carefully filled and weighed according to industry standard specifications for upmost quality and consistency. A robust nitrogen flush ensures minimum oxygen (less than 2.5%) for optimum shelf life.

Storage

Immediately following packaging, all T-90 hop pellets are transferred to cold storage units where all products are stored at -3^0C. T-90 pellets should be stored between -3 to $+5^0$C in original packaging or closed containers to avoid exposure to light and air to minimize oxidation of essential oils and alpha acids.

Shelf Life

Under storage conditions recommended above, T-90 pellets have a shelf life of three years.

Application

Crosby T-90 hop pellets are primarily used as kettle hop ingredient to provide bitterness and hop character to beer. Traditionally, kettle hopping with hop pellets will also lead to improved trub formation and wort sterilization.

Addition Procedure

Add T-90 Hop Pellets in wort early during kettle boil for bitterness and late during kettle boil for aroma. Pellets either are thrown in the brew kettle during kettle boil or added to custom designed dosing systems through which wort is back flushing, taking away the pellets to the brew kettle. Pellets can also be added both during and after fermentation.

Use Rate Calculations

Addition during early kettle boil to achieve average bitterness in high gravity wort/beer will typically lead to the extraction and isomerization of 30% of the alpha acids in the finished beer. Thus, addition rate is calculated as follows:

KgA = (BU x Hl) /3000

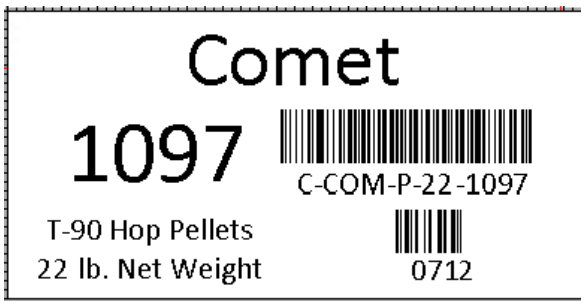
Where: KgA = Kg of alpha acids to add in the brew kettle

BU = is the desired amount of bitter units in the finished beer

HI = HI of finished beer

Use rates may vary depending on the brewing process and the desired hopping level. Addition procedure during kettle boil to provide bitterness and/or aroma will be dependent on the time of addition and the desired hop character in the finished beer. Hop formulation and addition rates will be determined on a case-by-case basis as well as addition rate during or post-fermentation to reinforce aroma in beer.

Labeling – Bag and Box



CROSBY HOPS™

Revision Number	Revision Section(s), Paragraph(s), and Description(s)	Summary of Changes	Revision Author	Revision Date*
1	Entire document	Created document	Kaitlyn Mac Leod	05/01/2024
2	Entire document	Annual review	Carman McKinney	06/11/2025
3	Entire document	Changed document reviewer and approval to Director of Quality	Jeff Edgerton	04/08/2026
3	Entire document	Annual review	Jeff Edgerton	07.01.2026

* Revision date is not the same as Effective date; see Approval section.

Approver Name (Printed)	Approver Role (Printed)	Approver Signature (Scanned or electronic)	Approval Date
Jeff Edgerton	Director of Quality	Jeff Edgerton	07.01.2026
Document Owner Name (Printed)	**Document Owner Role (Printed)**	**Document Owner Signature (If Approver, N/A)**	**Approval Date**
Jackie Crosby	Director of Operations	Jackie Crosby	07.01.2026