Key words: VLT, Main Mirror Recoating, Aluminum Layer

ESOcast Episode 120: **ChileChill 10 – "VLT Main Mirror Recoating"**	
00:00 **[Visual starts]** **New ESOcast intro**	**00:00** ESOcast introduction
00:20 1. Far away in Chile's Atacama Desert, **ESO's Very Large Telescope (VLT)** sits 2635 metres above sea level.	
00:32 2. These four huge telescopes contain some of the **biggest mirrors in the world, capturing billion-year-old light**.	
00:45 3. To catch as much faint light from the cosmos as possible, these mirrors have to be **extremely reflective.**	
00:57 4. A **layer of aluminium**, just 80 nanometres thick, coats the mirror surface — more than 50 square metres of Zerodur® glass ceramic. Over time the mirrors are exposed to dust and other pollutants.	
01:26 5. To maintain high-quality astronomical images, the mirrors must be cleaned and the aluminium coating **regularly replaced**.	
01:37 6. Recoating is an **intense and laborious procedure**. It is vital that the mirror is **not scratched or damaged** in any way.	

01:46 7. There is **no replacement mirror** if this goes wrong!	
02:00 8. The **eight-day operation** begins by carefully driving the 23-tonne mirror to the recoating plant.	
02:14 9. First, the underside is cleaned by hand to **remove all oils, particles and other contaminants**	
02:27 10. The mirror is then taken to the clean room for another round of cleaning, to ensure that **no large pollutants or dust remain** on the mirror's surface.	
02:53 11. **Acid then removes the aluminium film**, revealing the true amber colour of the material underneath.	
03:06 12. After final rinsing and drying, the mirror is moved **to the vacuum chamber**.	
03:16 13. After the air is sucked out, **electrically-stimulated plasma** completes the last cleaning and drying of the optical surface.	
03:23 14. Finally, aluminium particles are vapourised onto the mirror to create a thin, new, perfectly-reflecting coating. **A total of only 12 grams!**	
03:36 15. One final check is made to measure the reflectivity. The mirror is then returned home to the VLT to continue producing some of the **most**	

remarkable observations ever made.	
04:00 **[Outro]**	*Produced by ESO, the European Southern Observatory.* *Reaching new heights in Astronomy.*