HEAT TREAT / TRATAMIENTO TÉRMICO

MEXICO 26

Will Cheesman, Ipsen International GMbH

Tecnología de horno híbrido para un uso inteligente de la energía	**Hybrid Furace Technology for Intelligent Enrergy Use**
Los tratadores term r cos en fren tan precros de energia vol atr l es y objetrvos de descarbonrizacri6n s . sta presentacri6n resume u n en foque de horno h ib rr do que combrna quemadores mul tcombustrbl e de bajo N Ox Jgas n atu ral , h r dri6geno, propano) con cal en tam r en to el ectrr co, permrtrendo confrgu racr ones fl exr b l es de reparto gas/el ectrr co Jp s ejs, 8 quemadores y 4 resr sten cr as el ectrr cas)s Las pruebas TU S en horno vacio de 750-1 000°C mostraron u n a u n r form r dad comparabl e en modo sol o quemadores, sol o el ectrr co e h ib rr do J:: ± 7°C)s U n gemel o d r g r tal basado en srmu l acr i6n se ap l r ca a l a gestr i6n energetrca para despl aizar carga y recortar p r cos, optrm r izan do costo y CO2 segun precros d r n amrcos y factores de emrsr i6n de l a el ectrr cr dads nor u l tr mo, l os resu l tados de carbu rr izacr i6n Green. l ow demuestran grandes reduccrones de gases de proceso sr n afectar el resu l tado metal u rg r cos ahorro de 75 % del gas portador y 49% del gas de en rr quecrmrento JCH 4), con profu ndrdad de capa J~ 4,22-4,23 mm) y %C J0,3 5 %C) comparabl ess	Heat treaters face volatile energy prices and decarbonization targets. This presentation summarizes a hybrid furnace approach that combines multi-fuel low-NOx burners (natural gas, hydrogen, propane) with electric heating, enabling flexible burner/electric split configurations (e.g., 8 burners and 4 electric heaters). Empty-furnace TUS from 750–1000°C showed comparable uniformity for burner-only, electric-only, and hybrid operation (≤±7°C). A simulation-based digital twin is applied to energy management, supporting load shifting/peak shaving and optimizing cost and CO2 based on dynamic electricity prices and emissions factors. Finally, GreenFlow carburizing results demonstrate major reductions in process gases while maintaining metallurgical outcomes: carrier gas savings of 75% and enrichment gas (CH4) savings of 49%, with comparable case depth (~4.22–4.23 mm) and carbon content (0.35%C).