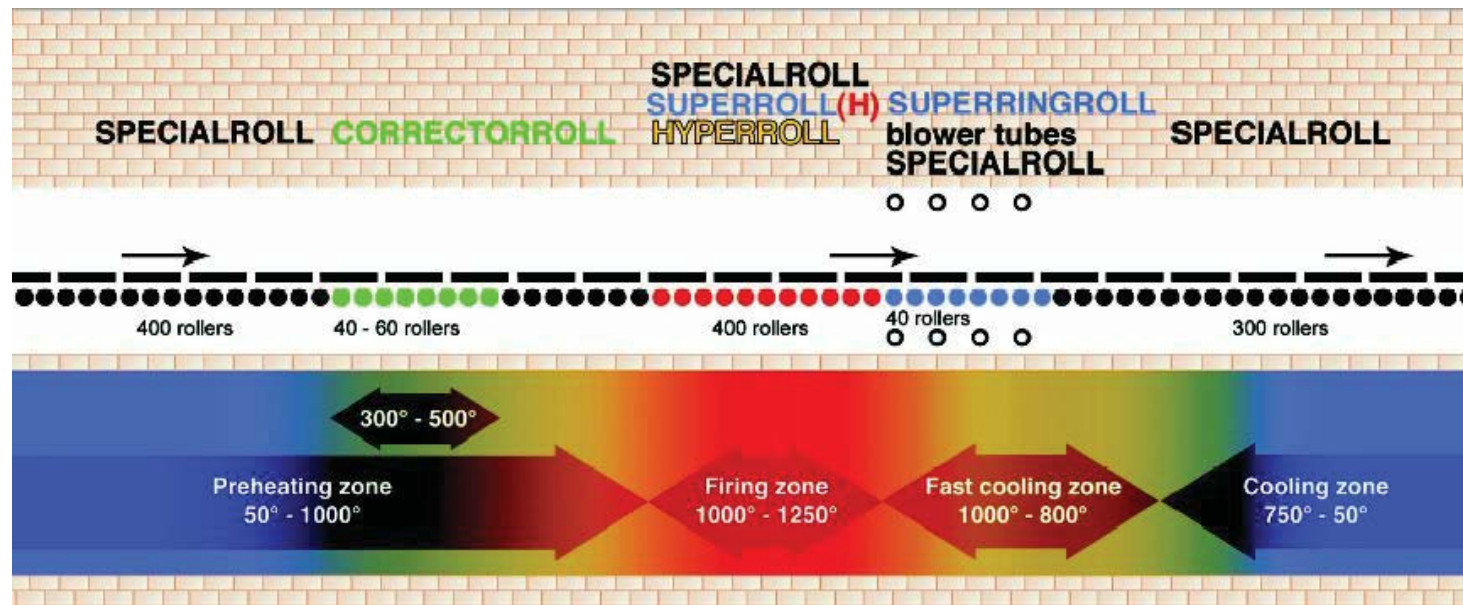
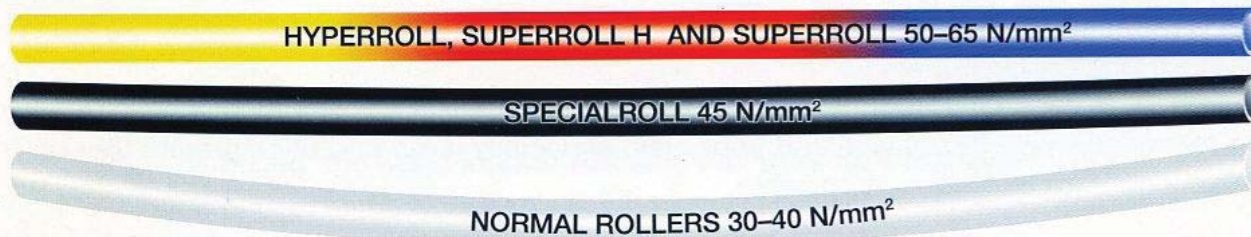


diamorph hob certec - production programme

Diamorph hob certec produces a full range of ceramic rollers that are used by producers of ceramics and tiles as essential parts of various kinds of kilns as well as by kiln manufacturers. It has developed special products that suit each type of kiln.



Deformation of roller materials under load and temperature



diamorph hob certec'S FULL RANGE OF PRODUCTS

SPECIALROLL – bending strength 45 N/mm² – operation temperature: up to 1240°C

SUPERROLL - bending strength 50 N/mm² - operation temperature: up to 1260°C

SUPERROLL-H - bending strength 55 N/mm² - operation temperature: up to 1280°C

HYPERROLL-NG - bending strength 70 N/mm² - operation temperature: up to 1350°C, excellently ballanced high bending strength with thermal shock resistance.

HYPERROLL-L - bending strength 60 N/mm² - operation temperature: up to 1300°C, economical version of Hyper-NG

HYPERROLL-D(ense nano) - bending strength 120 N/mm²– the first extra strong roller with **zero porosity** to improve the tile planarity and transport in the kiln. Excellent resistance against the chemical attack.

HYPERROLL-RCZ - bending strength 110 N/mm²– very strong roller designed for rapid cooling zone (RCZ), thanks to high thermal conductivity it enables to release efficiently the heat from the tiles outside the kiln to neutralise inner tensions inside the ceramic tile.

SUPERRINGROLL – hand made roller designed for rapid cooling zone. Advantage: reduced contact surface for intensive cold air circulation between the tile and the roller. The best tile cooling method to neutralise inner tensions inside the ceramic tile.

CORRECTORROLL positive/negative – a both sides conical roller with 3mm thicker/thinner diameter in the centre. It brings the arc-like running tiles in correct line before the firing zone to improve the quality by more planar surface and less deformed edges.

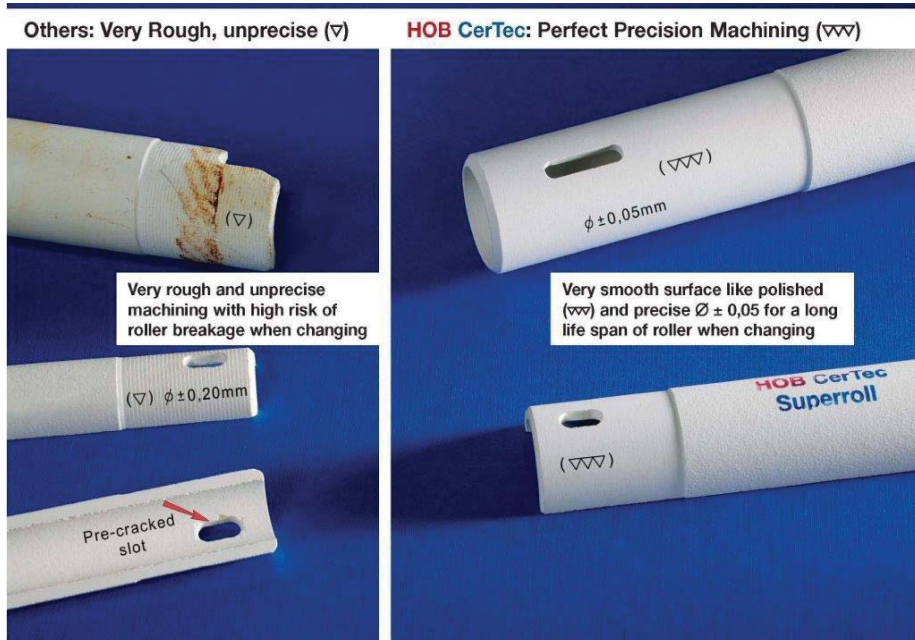
diamorph hob certec PRODUCTION

Rollers up to 5m length are produced out of very **pure raw materials**. Their perfect sintering is achieved by their firing **at high temperatures** in a modern top hat kiln.



diamorph hob certec PERFECT MACHINING

During production process the rollers are precisely ground, drilled and 100% laser checked.



Quality seal of laser check



Some other suppliers



diamorph
hob certec 
THE LEADER IN ROLLER INNOVATION



diamorph hob certec QUALITY

Each consignment is accompanied with the Inspection Report according to ISO 9001. TQM and ZERO DEFECT philosophy are applied in all departments.



Inspection Report

Quality verification

Description: **HYPERROLL-NG** 60 x 46 x 4550 mm

Receiver:

End User: **SITI BT**



CZ - Horní Břiza 330 12
Tel.: +420 378 010 910
Fax: +420 378 010 934
www.certec.cz
email: sales@certec.cz

Page 1 of 1

Order No.:		HOB CarTec CODE: 160135-00719		Lot Size: 1016		<input checked="" type="checkbox"/> thicker end marked by colour <input checked="" type="checkbox"/> in case of asymmetric roller ends mechanism: <input checked="" type="checkbox"/> 50% of the rollers have one type of mechanism on the thicker end, <input checked="" type="checkbox"/> 50% of the rollers have the same type of mechanism on the opposite end		<input type="checkbox"/> ISPM 15 BOXES <input checked="" type="checkbox"/> FUMED	
Insp. No.	Characteristic	Nominal value	Tolerance	Ins. Volume	Test and Inspection Results - Single values				
					X_{n-1}	X_{n+1}			
1	OUTER DIAMETER (mid)	60	± 0,55	100%	59,65	60,55			
2	LENGTH	4550	± 2	10%	4550	4551			
3	GROUND DIAMETER	59	± 0,2	10%	58,8	58,9			
4	GROUND LENGTH	55	1,2 / - 0,5	10%	55,3	55,6			
5	TOLERANCE IN ROTATION (mid)		< 3,20	100%	0,20	3,20			
6	TOLERANCE IN ROTATION (side)		< 2,00	100%	0,10	2,00			
7									
8									
9									
10							Randová D.		
Distribution		Decision notation:		Sing./Date		Application note:			
<input checked="" type="checkbox"/> Internal <input checked="" type="checkbox"/> End User		<input checked="" type="checkbox"/> fully accepted <input type="checkbox"/> conditionally accepted, corrections		Sing./Date: <i>17.10.2015</i> Final inspection by Q Manager		<input checked="" type="checkbox"/> released for shipping <input type="checkbox"/> after reworking			

CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

diamorph hob certec, s.r.o.
Tovární 739
330 12 Horní Břiza
Czech Republic

has been approved by Lloyd's Register Quality Assurance to the following Quality Management System Standards:

ISO 9001:2008

The Quality Management System is applicable to:

Production of technical ceramics, especially ceramics kiln rollers.

Approval Certificate No: PRA 0003907

Original Approval: 16 July 1998

Current Certificate: 30 October 2015

Certificate Expiry: 29 October 2018

Karel Kováčik

Issued by: Lloyd's Register EMEA, Prague office,
for and on behalf of Lloyd's Register Quality Assurance Limited



Tabořská 31, 140 00 Prague 4, Czech Republic
for and on behalf of LRQA Ltd 1 Trinity Park, Bickenhill Lane, Birmingham, B37 7ES, United Kingdom

Lloyd's Register Quality Assurance Limited, its affiliates and subsidiaries, including Lloyd's Register Quality Assurance Limited (LRQA), and their respective officers, employees or agents, are, individually and collectively, referred to in this document as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or for any other similar documents provided, unless the person has agreed with the relevant Lloyd's Register entity, for the provision of this information to such person and in that case any responsibility or liability is exclusively on the terms and conditions set out in all contracts.

diamorph hob certec

PRESENCE IN THE MARKET

Frequent contacts with the clients, flexibility and constructive approach towards the new requirements of the market →

The world longest kilns: 220 meter long and 2.95 meter wide.
Visit to Interceramic, Mexico, on 26.08.2013. **Hyperroll Dense Nano** installed through the whole kiln (roller size 52x3920). They run the rollers for 12 months in the firing zone and for 3-4 years in the pre-heating zone taking advantage of the strong **Hyperroll Dense Nano**.



In case of heavy dirtiness, in those modules they mix up **Hyperroll Dense Nano** with **Hyperroll N6** for easy exchange.



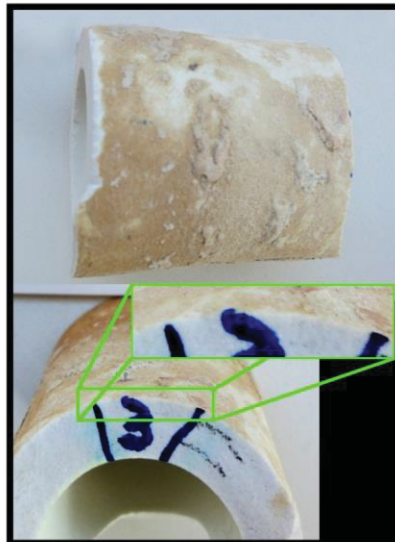


diamorph hob certec

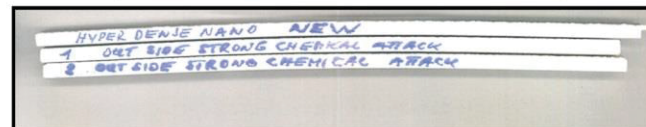
PERMANENT R&D, INNOVATIONS

→ Development of new roller designs & materials like Hyperroll-NG, Hyperroll-D(enseNano) and Hyperroll-RCZ

Hyperroll Dense Nano is the roller with the best performance against chemical attack. It has the best resistance and lifespan without losing its chemical or physical properties. The zero porosity creates an intrinsic barrier which protects the roller structure against the entry of chemical reagents.



The laboratory analysis confirms that the chemical structure and composition of Hyperroll Dense Nano does not vary when exposed to strong chemical attack conditions.



The bridge test shows that the physical properties and bending strength also remain the same.

HYPERROLL-NG - The most universal roller

Hyperroll-NG the new generation of rollers with **balanced high bending strength & excellent temperature shock resistance** for universal application in ceramic kilns for wide range of ceramic tiles production.




- **High bending strength** 70 N/mm²
- **Excellent temperature shock resistance** – max. peak T=1350°C
- **The most universal roller** for different types of ceramic tile production in one kiln.
- **Costs saving roller**, since installation possible at full working temperature, i.e. without losses of kiln production capacity caused with lowering the kiln temperature

diamorph **hob** certec - leader in the innovation

HOB CerTec the roller expert makes fundamental investigations and offers the best solution for perfect tile transport by very stiff roller

Hyperroll Dense Nano with extreme high Modulus Of Elasticity of 120 GPa (standard roller MOE 60 GPa only)



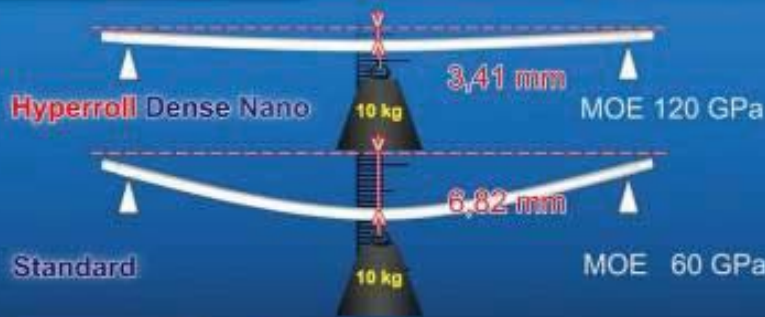
diamorph hob certec 

Hyperroll Dense Nano The last innovation

Material structure

Surface roughness & porosity

BENDING TEST



Comparison

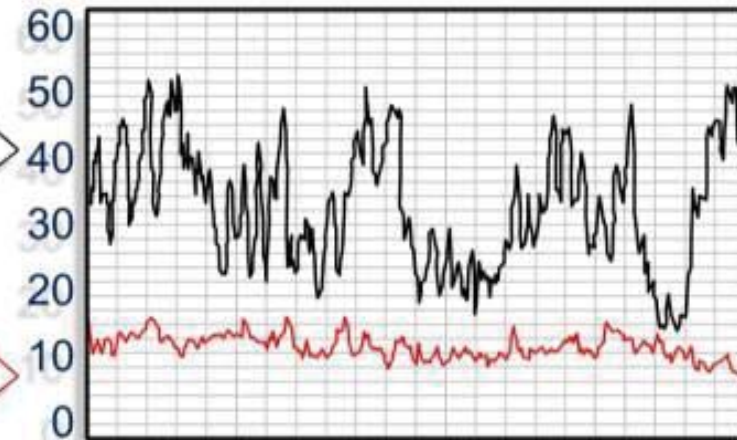


Standard Roller
Rt μm 52







Hyperroll Dense Nano
Rt μm 15

Rt μm



HYPERROLL-RCZ for the rapid cooling zone

The best rollers for rapid cooling zone is Superringroll or economical Hyperroll Dense RCZ from diamorph **hob certec**

Best solution	Roller type	Density (kg/dm ³)	Bending strength MOR (MPa)	Apparent porosity	Max. application temperature (°C)	Heat transfer by thermal conductivity (W/m.K)	Roller appearance
1	diamorph hob certec Superringroll unique ring shape with less contact!	2,55	55	20%	1000	3	
		Best solution but more expensive due to the diamond machining of rings. High MOE and medium thermal conductivity. The ring design gives excellent cooling of the tiles. *refer to catalogue of Superringroll for further information.					
2	diamorph hob certec Hyperroll Dense RCZ Highest MOR and thermal conductivity	2,65	110	0%	1350	4,5	
		Second best solution because it is very economical, it has very high MOR and thermal conductivity, there is not deformation under thermal stress and provides good cooling of the tiles.					
3	Grey rollers but with 40-60% SiC only	2,35	35 only	25%	900	1,5 only	
		Weak compromise because of the very low MOR and thermal conductivity. Tends to deform in rotation and gives not enough cooling to the tiles. High price.					
"1"	Real 100% RSiC (very expensive)	2,80	110	6%	1600	35	
		Theoretically this is the best solution but very expensive. No straight roller available, very heavy. The high thermal conductivity would burn the external metallic adaptors.					

diamorph hob certec's Hyper-NG + Hyper-D(ense Nano) + Hyper-RCZ

➔ new conception for existing and future kiln designs

