



# HEGGIES

20 July 2007

30-1753 HDPE Idler Self Noise Type Testing 20070719.doc

Longwall Advantage Pty Limited  
PO Box 57  
Morisset NSW 2264

**Attention: Lindsay Auston**

Dear Lindsay

## HDPE Idlers Self Noise Testing

### 1 Introduction

Heggies Pty Ltd (Heggies) was commissioned by Longwall Advantage Pty Limited on behalf of Megaroller South Africa to measure the Sound Power Level (SWL) of HDPE conveyor idlers.

### 2 Supply Specification

The aim is for the self noise of the idlers to achieve the design Sound Power Levels shown in **Table 1**.

**Table 1 Idler-Roll Self Noise Overall Sound Power Level Criteria**

Idler-Roll Length Range	Overall Sound Power Level (dBA re 1 $\mu$ W)
500 mm - 800 mm	67 dBA
801 mm - 1100 mm	68 dBA
1101 mm - 1500 mm	69 dBA

This report details the results of a type test, where three of each idler-roll type were selected at random and tested on a suitable test rig. It should be noted that the purpose of the test was to quantify the idler self noise when such rolls are operated at their design speed.

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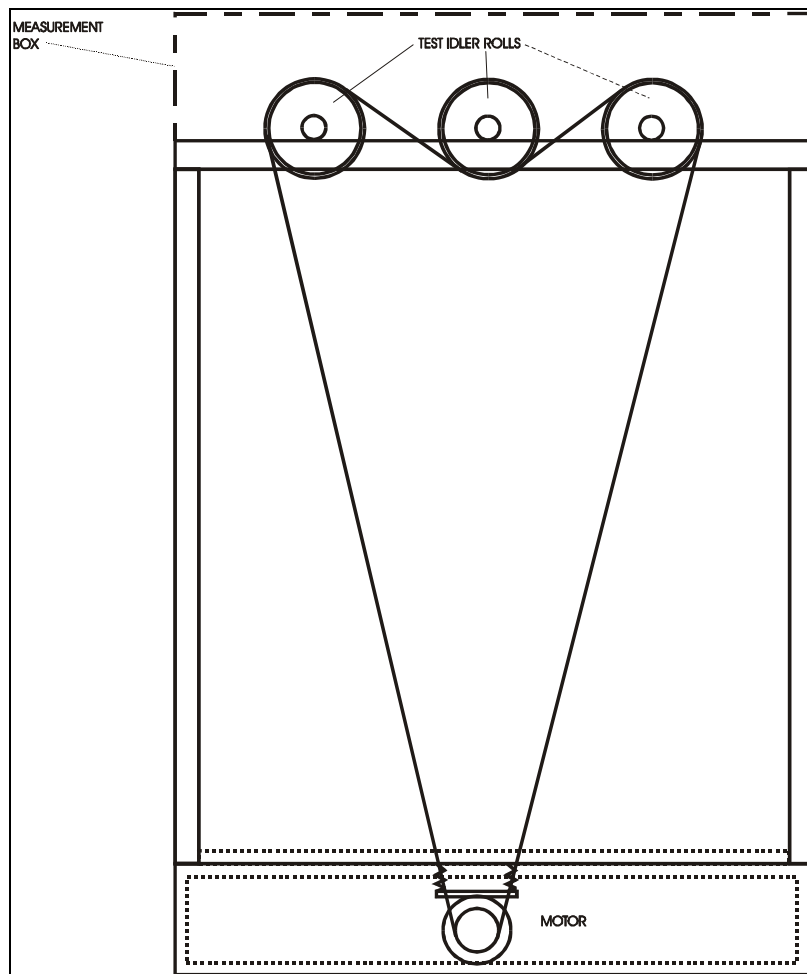


### 3 Self Idler-Roll Noise Test Rig

#### 3.1 Physical Layout

**Figure 1** shows a diagram of the Self Idler-Roll Noise Test Rig. A 240 V AC electric motor was soft mounted to the frame at the base of the rig. A 15 mm diameter “O”ring drive belt was made at an appropriate length to enable the belt to be stretched into place providing friction drive of the three test idlers overhead.

**Figure 1 Sketch of Self Idler Noise Test Rig**



#### 3.2 Test Rig Background Noise and Vibration

The average background SPL was determined to be more than 10 dBA below SPL arising from the lowest specified idler-roll SWL.



## 4 Measurement Procedures

### 4.1 Instrumentation

The following instrumentation was used in this investigation:

- Sound Intensity Measurement System
- Precision Sound Level Meter      Brüel & Kjær      Type 2260
- Sound Intensity Calibration      Brüel & Kjær      Type 3541
- Sound Intensity System      Brüel & Kjær      Type BZ 7205

The above system was calibrated prior to and subsequent to testing. No significant drift in calibration was noted. The residual pressure intensity index was saved for each test and used to check the validity of each measurement.

### 4.2 Test Procedure

Three randomly selected test idler-rolls were mounted on the test rig and connected to the electronic motor via a flexible “O” ring drive belt.

Each of the six rectangular measurement surfaces was scanned using the sound intensity probe, and in accordance with the requirements of ISO 9614-2. Any measurements which produced errors due to extraneous noise were discarded and the test repeated.

Measurements which resulted in dynamic range or repeatability errors were only accepted if the offending third octave bands were not making significant contribution to the overall “A” weighted sound power level, such bands were excluded.

The resulting total sound power level from the test was adjusted (reduced) by 4.8 dBA to produce the average sound power level for one idler-roll.

### 4.3 Measurement Accuracy

Measurements were carried out in accordance with the engineering quality (Grade 2) in accordance with ISO 9614-2 (1996). For this grade of measurement ISO 9614-2 states a standard deviation of 1.5 dBA on the overall “A” weighted SWL. This means that the true value of the A-weighted SWL is expected with a certainty of 95% to be in the range of  $\pm 3$  dB about the measured value.

## 5 Test Results and Compliance Statement

**Table 2** shows the results for each test as well as the resulting maximum sound power level of the idler-roll type test. The results include the extraneous noise from the motor, and hence, are not within the accuracy tolerance stated in **Section 4.3**.

**Table 2** Idler-Roll Type SWL Test Results (dBA re 1 $\rho$ W)

Idler-Roll Type Description	Total Measured SWL for 3 Idler-Rolls	SWL for Single Idler Roll	Supply SWL Criteria
900mm HDPE Idler (Blue) Part No. MR 152/300/900	57.4 dBA	52.6 dBA	68 dBA

Note 1: All idler-rolls diameter 152 mm.

Note 2: All idler-rolls tested at design rotational speed 640 rpm.



## 5.1 Compliance Statement

The results presented in **Table 2** demonstrate that the SWL of the HDPE idler-roll type tests clearly comply with the noise design goal.

I trust that the preceding provides sufficient detail for your current requirements. If you require any further information please contact me on ph 4908 4500 or email [rod.linnett@heggies.com.au](mailto:rod.linnett@heggies.com.au).

Regards

**Senior Project Consultant  
Heggies Pty Ltd**



# HEGGIES

## Sound Power Level Noise Certificate HDPE Conveyor Idlers No Load 640 RPM

### Equipment Under Test

Equipment Description: HDPE Conveyor Idler 900mm  
Manufacturer: Megaroller  
Type: MR152/300/900 HDPE Roller  
Serial Number:  
Test location: Longwall Advantage Workshop  
Test Date: 18 July 2007  
Personnel: Rod Linnett - Heggies Pty Ltd  
Client: Longwall Advantage

### Test Conditions

Load Condition: **No Load 640 RPM**  
Direction of Rotation: Clockwise  
Mounting Conditions: Test Rig

### Acoustical Environment

Description: Indoors

Air Temperature: Not recorded.  
Barometric Pressure: Not recorded.  
Relative Humidity: Not recorded.  
Acoustical Treatments: Not recorded.

### Instrumentation

		Serial Number	Calibration Due Date
Sound Analyser:	Bruel & Kjaer Type 2260 Modular Precision Sound Analyser	2217588	21 July 2007
Intensity Probe:	Bruel & Kjaer Type 3595 Sound Intensity Probe Kit	2120495	21 July 2007
Calibrator:	Bruel & Kjaer Type 3541 Sound Intensity Calibrator	1564397	21 July 2007
Spacer:	Bruel & Kjaer 12mm spacer	N/A	N/A
Windscreen:	Bruel & Kjaer wind shield	N/A	N/A
Calibration Procedure:	Calibration check prior to measurements using intensity calibrator.		

### Measurement Procedure

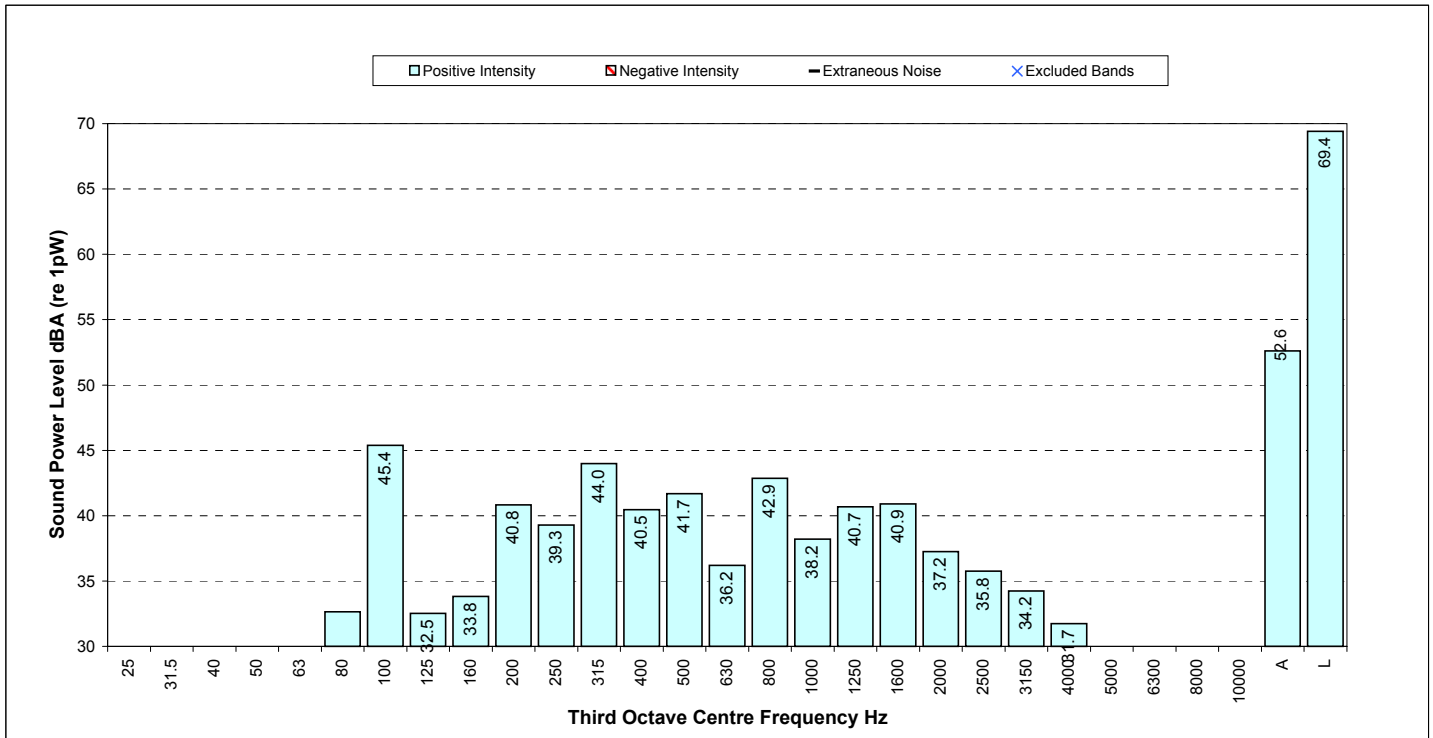
General: Measurements were guided by the requirements of **ISO 9614-2 (1996)** Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 2: Measurement by scanning.

Grade: Engineering (Grade 2).



# HEGGIES

## Sound Power Level Noise Certificate HDPE Conveyor Idlers No Load 640 RPM



3rd Octave Band Centre Frequency (Hz)	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	Overall
Measurement Results (dBA - see notes)	28	28	33	45	33	34	41	39	44	40	42	36	43	38	41	41	37	36	34	32	30	29	<b>52.6</b>
95% Tolerance Interval (+/- dBA)	6	6	6	6	6	6	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	5	3
Tonal Bands (>5 dBA above mean of adjacent bands)	-	-	-	-	-	-	-	-	-	-	-	-	-	Yes	-	-	-	-	-	-	-	-	-

Octave Band Centre Frequency (Hz)	63	125	250	500	1k	2k	4k	Overall
Calculated Octave Band SWL (dBA)	<b>35</b>	<b>46</b>	<b>47</b>	<b>45</b>	<b>46</b>	<b>43</b>	<b>37</b>	-
Measured Overall ISO 9614-2 SWL (dBA)	-	-	-	-	-	-	-	<b>52.6</b>

Note 1: The overall sound power level measured in accordance with ISO 9614-2 (1996)

Tested By: RL Authorised By: JC

Date: 19-7-07 Date: 19-7-07